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Joint Municipal Service Board

ENGINEERING REPORT

RIVER ROAD DRAIN

Town of Bradford West Gwillimbury

County of Simcoe

September 18, 2020

File No. 19-034

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TOWN OF BRADFORD WEST GWILLIMBURY

To Mayor and Council
Town of Bradford West Gwillimbury

1.0 SUMMARY

This is a drainage report that is prepared pursuant to Section 4 of the Drainage Act, RSO 1990. The primary purpose of this report is to provide for improved drainage to River Road and the lands adjacent to it.

This objective will be achieved by providing for the construction of a new drainage works on the west side of River Road in the interval between Canal Road and Hillsview Road, and on the same west side in the north two thirds of the interval between Hillsview Road and Weber Road, and by providing for an outlet for the new River Road drainage works with the construction of a further drainage works easterly along Hillsview Road and adjacent lands to the Central River. This report also provides for the construction of a short length of new tributary drainage works west along the unopened portion of Hillsview Road.

The work undertaken with the preparation of this report has followed the normal procedures of the Drainage Act which have involved an on-site meeting, review of the site, survey and design work, and the preparation of a report to include plan and profile drawings, cost estimates, assessment and future maintenance schedules, specifications, and miscellaneous paragraphs regarding the project description, etc.

The proposed new drain will be known as the River Road Drain. A summary of the proposed drain work is as follows:

- On Hillsview Road starting at the Central River and progressing westerly upstream to the west side of River Road, the drain will consist of a combination of 750mm diameter closed drain/culvert work[1], and open drain work between the lengths of 750mm pipe. This portion is to be called the Hillsview Road East Branch.
- Along the west side of River Road to the north of Hillsview, the drain will consist primarily of an open drain on or adjacent to the boundary between River Road and Hillside Farms. Five separate short lengths of 600mm diameter culvert will be placed in this length of open drain. This portion is to be called part of the River Road North Branch.
- Where the River Road North Branch drain reaches the Petherick property at the intersection of River Road and Canal Road the drain will transition to a short length

[1] The very upper portion of pipe will be 600mm dia.

of 300mm diameter piping and also a 91 metre length of a new curb and gutter along River Road. This work will also be part of the River Road North Branch.

- Along the west side of River Road to the south of Hillsview Road, the new drain will consist of a 525mm dia. closed drain generally below the west shoulder of the road.
- Offset hickenbottoms will be constructed in four locations in this south component to admit surface waters from the adjacent low lying fields to the new 525mm drain. These items of work will be called the River Road South Branch.
- Along the unopened portion of Hillsview Road to the west of River Road a short length of closed drain (twin 300mm piping with hickenbottoms) is to be constructed and known as the Hillsview Road West Branch.

A summary of the drain is that it consists of 1,097m of new open channel and 1,065m of new closed drain/culvert work.
The watershed served is 70.29 hectares (173.7 acres).
The total estimated cost of the work is $759,910.

Schedule A shows the assessment of the total estimated cost to the affected lands and will be used for prorating final/actual costs.
Schedule B is to be used for prorating future maintenance costs, when incurred, on the River Road Drain.
These schedules are on pages 43 & 44.
Appendix A illustrates the calculation of the assessments outlined in Schedule A and Appendix B illustrates the calculation of the assessments outlined in Schedule B.
Appendices A and B are on pages 45 & 46.

Appendix C (separate attachment) has data that summarizes all estimated gross and net assessments.[2] It is of assistance when preparing the final/actual cost bylaw and grant form. It shows the estimated net costs to all parties if available grants are received and if the allowances are deducted from the assessments.

2.0 BACKGROUND

On August 9, 2018 the Director of Community Services for the Town of Bradford West Gwillimbury, as the individual responsible for roads, signed a petition pursuant to Section 4 of the Drainage Act. As is the requirement for all projects within the Holland Marsh area, the petition was submitted to the Holland Marsh Drainage System Joint Municipal Services Board (HMDSJMSB). The petition was subsequently accepted and at that point the decision was made to obtain proposals from Engineering firms to prepare the report required by the petition.

A request for quotations to prepare a report on the petition was issued on January 7, 2019, and on February 28, 2019, the quotation by K. Smart Associates Limited (KSAL) was accepted. Subsequently, on March 13, 2019, KSAL executed an agreement with the HMDSJMSB to prepare a report pursuant to the Drainage Act for the petition by the Director of Community Services.

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[2] [2] *A "net" assessment is a "gross" assessment reduced by the available one-third grant (if applicable to the assessed party) and by land allowances to be made (if applicable to the assessed party).*

3.0 DRAIN HISTORY

There is no existing documented drainage system along River Road. River Road would be within the watershed of the Holland Marsh Drainage System and specifically any drainage runoff from River Road and/or the adjacent private lands would primarily outlet into what is known as the Main Drain or the Central River component of the Holland Marsh Drainage System. The exception would be that the very north limits of River Road and the lands adjacent to it are led by a shallow ditch to a pumping scheme and the waters are then pumped into the North Canal of the Holland Marsh Drainage System.

Most of River Road in the area requiring drainage and adjacent lands are served by shallow ditches and/or subsurface drainage schemes that are outletted into pumping schemes that in turn discharge into the Central River or North Canal outlets.

There is a constructed private open channel of some magnitude at the rear of the lots that front on the west side of River Road in the area between the unopened Hillsview Road and the unopened Weber Road. This open channel does continue further south to the Central River but very little of the area requiring drainage, if any, would outlet into this channel. (This is called Ditch A for purposes of this report background).

There is also a combination of a closed drain and an open drain that runs east from the buildings of the major farming operation (Hillside Farms) on the east side of River Road in the area to be served, east to the Central River. A portion of the lands that front on the west side of River Road are presently serviced by a pumped drainage outlet into this system. (This is called Ditch B for purposes of this report background.)

This Ditch B system could naturally serve as the surface water outlet for most of River Road and adjacent lands that require drainage if there was a continuous gravity connection by swale or ditch (and if some improvements to this system were also made). However, since there is no such connection, the area requiring drainage must pond until pumped subsurface drainage systems are able to remove the surface drainage.

Further to the south in the area of the Weber Road allowance, there is a closed drain outlet which runs from River Road to the Central River. Many of the lands on the west side of River Road that would benefit from improved surface drainage are currently tile drained and pumped into this closed drain.

4.0 INITIAL INVESTIGATION

4.1 On-Site Meeting

Attendees:

K. Smart Associates Limited (KSAL) - Kenn Smart, P. Eng., Curtis MacIntyre, EIT (now P.Eng.)
Town of Bradford West Gwillimbury (BWG) - Frank Jonkman & Ruth Westlake
Landowners - Susan Vonk, Mario Palumbo, Ron & Ralph Scholten, Steve Flanigan, Tim Vanderkooi, Xiao Ping Guan, LeeAnn Hoskins, Tom & Nancy Petherick and Kevin Beckett

On June 26, 2019, the on-site meeting for the Section 4 appointment was held at intersection of Hillsview Road and River Road, and those in attendance, as they signed in, are listed above. The Engineer explained the purpose of this meeting relates to the petition by the Town of Bradford West Gwillimbury for improved drainage along River Road. Kenn stated that he believes the request/hope is for improved ditching along the west side of River Road commencing at Canal Road, crossing River Road to the east side, continuing downstream of Hillsview Road on the east side, and then outletting at the Central River. He further explained that although it is anticipated a large portion of the costs will be borne by the Town, there will still be assessments to adjacent benefiting lands, as well as to lands that outlet into the proposed drainage works. The engineer gave an opportunity to each landowner in attendance to describe the drainage on their property. Comments are described below.

N. Petherick (Roll No. 006-03200)

- Stated that they are often flooded out on their property and would like something done up to their residential property. Kenn said any new ditch work could go up to their property and the drain could potentially be just a swale along the edge of their property that they could mow/maintain.
- Asked if the ditch will take up some of their property and impact their trees. Kenn said it was possible that this may happen, but if it were to be a swale it would take up less space. Kenn also explained “allowances” would be given if the drain ended up being on a portion of their property.
- It was pointed out that an artesian well exists near the southeast corner of the property. This well continuously discharges water to a private drainage system at Hillside Farms.

Mario Palumbo (Roll No. 006-03310)

- Did not believe that their property was affected by this proposed drain. Kenn agreed that they probably will not be further affected.

Susan Vonk (Roll No. 006-03400)

- Stated that she has a waterline to her property, but did not know where it is. Tim Vanderkooi believed it comes from the Hillside property (Roll No. 006-03300), but however, was not sure exactly where it went either. Said he only recently found out about it.
- May be agreeable to a ditch outlet north of their buildings or along their property line east to the Central River. Kenn stated the ditch would not likely cross in front of the built-up portions of their property along River Road.

Steve Flanigan (Roll No. 006-04401 – Representing the De Winter Property)

- Did not believe that he was affected. Tim Vanderkooi said that the sump pump from Steve’s house goes into the ditch/pipe system on the Hillside property that runs east from River Road to the River (called Ditch ‘B’ at this meeting). They may therefore not be affected.

Kevin Beckett (Roll No. 006-03304)

- Stated that there is substantial ponding to the rear of their property. His sump pump runs considerably.

Ron Scholten (R. Scholten, Korag Farms Limited)

- He said the easterly Korag Farms Limited (Roll No. 006-05500) property is tiled to north and is pumped to canal. Surface waters go into the "Ditch B" (t*herefore most likely out of watershed)*.
- He said the R. Scholten property (Roll No. 006-03800) is tiled south to the river (t*herefore most likely out of watershed)*.
- When asked, Ron advised that he believes the properties of G. Verkaik (Roll No. 006-02400) & J. Devald (Roll No. 006-02700) are both tiled to the north & pumped into the North Canal. He is not sure of surface water drainage from these farms.
- He stated that he rents the Zhang property and that it drains south and outlets to the private ditch that exists at the rear of the farms that front on River Road (called Ditch A at this meeting).
- When asked by Kenn about their estimation of the depth of peat in this area, Ron believed it is approximately 3-4 feet.

Tim Vanderkooi (Hillside Gardens Limited)

- He stated their farms on the west side of River Road (properties with roll no. 006-03301, 006-03302, 006-03303 and 006-03305) do flood and need improved drainage.
- He stated that there are irrigation lines on the properties with Roll No. 006-03500 and 006-03305. He said the irrigation line on property 006-03500 is 12" dia. for 1000' northerly from south edge of property, then changes to a 10". Tim thought that it was approximately 10-12 feet off of the edge of River Road. The irrigation line crosses River Road westerly just north of Weber Road.
- He believes it makes sense to run ditches along the sides of River Road if such can be done considering the irrigation lines that exist.
- He said their properties with Roll No's. 006-02900 and 006-03300 are tiled easterly to a "croc" and are then pumped to a pipe across River Road and to the ditch running east to the Central River (Ditch 'B'). We would likely intercept this with any proposed River Road Drain.
- Tim stated that Carron Farms (Roll No. 006-05300) are tiled southerly through their farm (006-00101) and then into Ditch 'B'.
- Properties with Roll No.'s 006-04400 & 006-00101 are tiled northerly and southerly, either to the north canal or Ditch 'B' and are out of the watershed.

Additional Drainage Concerns

At the meeting additional concerns were raised regarding drainage problems around the unopened road allowance west of the intersection of Hillsview Road and River Road. The general concept discussed was to construct a branch drain ditch in the centre of the unopened road allowance from the western limits of property with Roll No. 006-03301 to the east and outlet at the proposed River Road Drain. Tim Vanderkooi appeared to be in favour with this concept, however Ron Scholten asked if it were possible to just do the proposed River Road Drain and leave this westerly branch for a future date. Kenn stated that a Contract 1/Contract 2 scenario could be implemented in this report as has been done in several other reports. Kenn said we would likely survey this potential branch ditch now and

gauge interest later. The work could be done under the Town's petition since it would be in a road allowance.

4.2 Site Examination & Survey

At the time of the on-site meeting, it was anticipated that the drainage works that would be constructed to serve the petition would be to construct an open channel on the west side of River Road commencing at the Petherick lot and continuing southerly on the west side to River Road with a crossing of River Road at Hillsview Road and then continuing further south on the east side of River Road as an open channel with an open channel outlet running easterly to the Central River either at the north limits of the Vonk property near the property line between Vonk and Hillside, or fully on the Vonk property just north of their buildings.

However, as indicated by the on-site meeting minutes, it became known that a substantially sized irrigation line exists on the east side of River Road generally from the south limits of the residential lot on Hillsview Road down to near the Vonk property. This irrigation line was evident at the site examination since a number of risers off of the irrigation line were evident and it is to these risers that the landowner would join irrigation lines at times when irrigation was necessary.

It became evident that the irrigation line would make it difficult for ditch work to be done on the east side of River Road since an open channel would have to be constructed very close to where the line appeared to exist. It was also evident that the irrigation line would have to be exposed to confirm its location – vertically and horizontally.

It was also evident at the time of the on-site meeting that the number of residential properties with landscaping, etc. along the west side of River Road from Hillsview Road southerly to Weber Road would make it difficult to construct a new drain on the west side of River Road. It was evident also that Hydro and Bell lines exist on the west side of River Road.

Also at the site meeting it was indicated that a water line existed between four residential lots on the west side of River Road and it was evident that the well from which the line leads could be a factor also in works on the west side.

With respect to the requested work at the Petherick lot to improve the drainage that comes off of Canal Road and River Road, the works would not be simple due to the vegetation and landscaping that exists on that lot.

It was evident therefore at the site examination that various alternatives for drainage along River Road would have to be examined.

Accordingly, a Global Positioning System (GPS) survey was conducted along River Road and also a firm was retained to daylight the existing irrigation line on the east side of River Road. Hand work was also done to locate the water line on the west side of River Road.

Also, as a result of the request that the report should allow for a drain along the unopened Hillsview Road from west to east (part of the Ditch A route as referred to at the site meeting), it was determined that it would be necessary to survey this route. Considering the site meeting

comments and the site examinations, it was felt this route would have to be examined not just as a branch drain but perhaps as an alternative outlet for drainage to the west and south if the irrigation line and water line precluded work along River Road to the south of Hillsview Road.

Also, it was determined that a preliminary survey should be conducted along the private ditching and pipe drain that runs east from the Hillside buildings to the Central River (Ditch B as referred to at the site meeting), to see if it could serve as an outlet route.

Also it was determined that preliminary survey work should be undertaken along Hillsview Road east from River Road to the Central River to see if this route could also be an outlet possibility.

4.3 Results of Daylighting Work along River Road

It was found that the main irrigation line that exists on the east side of River Road generally between Hillsview Road and the Vonk property, is very close to or on the property line of the road and that the main line is offset from the risers that are visible. It was determined that an open channel could not be constructed between the irrigation line and the road since insufficient cover would exist on the irrigation line and an insufficient width exists between the risers and the line itself.

It was also determined that if an open channel were constructed to the east of the irrigation line, the ditch would be fully in the fields and would not be able to provide service by means of culverts or pipe leads to the west side of River Road and to the lands that front on the west side of River Road. Also the irrigation line's elevation at the south limits of the Hillside property would preclude any ditch or pipe crossing it. It was also found that the field elevation to the east of the line was too low to allow a pipe drain, in lieu of a channel, to be constructed.

It was concluded, after the irrigation line was exposed, that if a drain were to be constructed on the east side of River Road between the Vonk property and Hillsview Road it would have to be a closed drain below the east shoulder of the road so that the irrigation line could remain and so that drainage on both sides of the road could be attended to. Even this option would be associated with a conflict where the drain and irrigation line would have to cross.

Alternatively, it became evident that what could be looked at is a relocation of the irrigation line to be below the east shoulder of the road so that a shallow channel could be constructed along the property line as originally anticipated when the petition was signed. It was anticipated that high costs would be involved with relocating the irrigation line and it would have to be relocated even down to its inlet in the Central River.

4.4 Results of Waterline Locating and Work Possible on West Side of River Road South of Hillsview

The water line on the west side of River Road was hand located and was found to be sufficiently offset from the road that it would not interfere with an open channel on the west side of the road to the south of Hillsview.

However, it was found that the landscaping on the four lots, the Bell and hydro lines that exist and the number of field entrances and irrigation line placement routes required would preclude open channel work on the west side of River Road.

It was concluded that if there were to be a drain on the west side, it would have to be along the shoulder of the road in much of its length as a closed pipe and could only be an open drain in between the residential lots and where field entrances and irrigation routes were not required.

Alternatively it would have to be a continuous closed drain below the shoulder.

4.5 Results of Investigating a Route Westerly along the Unopened Hillsview Road Allowance (To Ditch A)

The results of investigating the unopened Hillsview Road allowance to the west and then the ditch that runs south from this road allowance to the Central River along the back of the farms that front on River Road (Ditch A as referred to at meetings) indicated that this route could be used as an outlet but not as a good outlet. It was found that significant tail water (from the Central River) exists in this channel (to elev. 216.9±) and if this route were used, this tail water would sit in the channel even up to River Road (and probably at elevation 217.2±). The elevation of the tail water in this route would be too high to allow the required field drainage on the west side of River Road. (Low lands there are elevation 217.15±.)

It was found, however, that if a ditch were excavated along the unopened Hillsview Road allowance portion from a west to an east direction, such ditch could intercept some top waters that flow from north to south. Also, the easterly portion of such a ditch here could provide an outlet for some of the ponding that occurs to the south.

Even if only the east portion (50m±) of the road allowance were just “swaled” or “tiled” (so farming could still occur) to any new drainage on River Road, an improvement for the flooded lands to the south should occur.

4.6 Results of Investigating Private System that Exists East from Hillside Buildings (Ditch B)

The survey results indicated that approximately one half of this route exists already as a closed drain (and not as a continuous closed drain but rather as a closed then open then closed then open again). It was found that this system does not have good access and its water level where open is only 0.5 metres below field level in most of its length. A substantial length (80m) of paved commercial lands would also have to be traversed. All of the length would be on private lands and the length would be similar to the length along the Hillsview Road East outlet route. Maintenance of any drain along this route would be a challenge.

The water level that does exist in the system near River Road would however allow a closed drain from River Road to outlet into it.

However, any new closed drain further downstream along its route would be primarily below water level.

Maintenance of the open portion would be difficult in some areas.

4.7 Results of Investigating a Route Along Hillsview East to the River

With respect to a route along Hillsview Road to the east, it became evident that this route offered improved possibilities. Although a drainage system does not exist continuously along Hillsview Road to the east, it was found that there would be minimal but sufficient gradient from River Road to take any new drainage east to the Central River with an outlet elevation (if ditch) close to what would be available if all work went south and then east to the Central River at the Vonk property.[3] This route also offered advantages of discharging into the Central River at a location where maintenance in the River would be readily possible because of access already existing to this area.

It was found however that interference with some properties could be created by this route. It was determined that if the work involved an open channel along the Korag and Hillside properties where presently the owners work up close to the road, such would reduce the areas that could be planted and harvested.

It was found that if an open channel outlet route that exists along this route into the river on the Wong property on the south side were used, the ditch and culvert system there would have to be enlarged and would have a significant impact on lawn, landscaping and laneways that exist on the lot.

It was also found that another irrigation line exists on the south side of Hillsview Road in front of the Wong property that would also complicate work done along this route if the Wong property were used.

It was concluded that this route could be used provided the first portion west of the River was a closed system along the road, provided compensation was made to the Korag and Hillside properties, and provided field entrances were provided to these properties.

4.8 Results of Investigating Low Lands South of Unopened Hillsview Road Allowance, West of River Road and North of Unopened Weber Road Allowance

This is the area in this watershed where the most significant ponding occurs after snow melt and/or rainy periods. It is this area that cannot “drain out” by gravity due to River Road and adjacent lot construction.

A GPS survey was conducted in this area and this survey found that the natural surface drainage would be from a southwest to northeast direction and would naturally run to River Road just north of the Hillsview intersection. The survey found that the fields are as low as elevation 217.10± and are flat with very little gradient to the north. At River Road there is no culvert across the road or any channel east of the road to join to. A pumped outlet exists further to the north (as discussed here) but waters would have to rise over a rim (250mm± higher) to even reach the pumping scheme. Overflow from the fields opposite to natural flow directions to the west to what is called Ditch A that flows south, or to the south to flow over

[3] It was found the River level would allow a new drain along Hillsview Road to be at or just above river water levels from fall to spring but would be 200 to 220mm above and sit in the ditch bottom or pipe invert in the spring to fall period.

Weber Road is not realistic since the overflow elevation along either boundary would be in the magnitude of elevation 217.60±.

This low field area is tile drained but a tile drainage system can not provide quick relief from ponded conditions and certainly the existence of peat soils in this watershed renders a tile system even slower to drain ponded surface waters. The tile drainage system here drains southeasterly to a pumped outlet that exists in the northwest corner of the Weber Road/River Road intersection. The pumped outlet crosses River Road and goes southeast to the River.

It was concluded that if a ditch or surface water inlets (catchbasins, hickenbottoms, culverts to a ditch or equivalent) could be provided along the west side of River Road, a much improved outlet for surface waters in this low lying field area and adjacent to the road could be provided. If such outlets were provided along the west side of River Road and/or along the rear of some of the developed lots that exist on the west side of River Road leading to a drain on River Road, drainage would be greatly improved and would address the restrictions that River Road itself creates. Also if such outlets were provided, the landowners could grade or swale their fields slightly to the new outlets to provide even more relief.

Of course, an open channel in the fields themselves could be provided but such would have an unacceptable impact on field cultivation and drainage systems that exist.

Ditch A (north/south portion) and Weber Road would be the westerly and southerly watershed boundaries of this low field area.

4.9 Results of Investigating the Petherick Property

A survey was conducted on this property and on the adjacent Canal Road and River Road. The survey results showed that at the intersection of the two roads, waters would run off the roads to a low area on the residential lot east of the house and north of the driveway. Waters would pond there before overflowing the driveway. The overflow waters would then run southerly to the private ditch that exists along the north limits of the Hillside Farms property. This private ditch runs westerly to a location from which the waters are pumped north across Canal Road to the North Canal. This private ditch is also the outlet for the small ditch that exists on the west side of River Road in this area. This private ditch, it was also found, could be improved to flow east to River Road if a new outlet at River Road were provided.

It was found that Canal Road north of the Petherick property has a small crown in it opposite the northwest corner of the Petherick residence.

Road waters from the west of this crown would drain to a swale/low area at the rear/west of the residence that runs southerly to the same ditch just described that is eventually pumped north to the North Canal.

Waters from the east of this road crown would drain to the low area north of the driveway east of the residence.

It was concluded that any works of improvement on the Petherick property should either intercept the road waters if possible and carry such to an outlet south of the Petherick property

or provide for a new surface water inlet on the north side of the driveway with an outlet to the south to any new system on River Road.

The artesian well that exists on the Petherick property, and that was discussed at the on-site meeting, was found to be in the southeast corner of the lot, 7± metres west of the River Road allowance and 6± metres north of the Hillside Farms property. It was concluded its overflow could readily be redirected to any new outlet that could be constructed on River Road.

4.10 Results of Investigating the Farm Properties West of River Road and North of Hillsview Road

A topographic survey was also conducted over the lands that exist west of River Road, north of the unopened Hillsview Road allowance, south of Canal Road and east of the line between Lots 4 and 5, Concession 2 (which is in line with the Ditch A north/south component).

It was found that natural surface drainage from these lands is from a northwest to southeast direction with the low area being in the northwest quadrant of the Hillsview and River Road intersection.

An existing private ditch that drains south to Ditch A intercepts drainage at the northwest corner of this area but the balance drains southeasterly.

With respect to subsurface drainage in this area, the Hillside Farms properties on the west side of River Road in this area are tiled to a pumped outlet on the west side of River Road generally in line with the Ditch B system to the east. Indeed the outlet for this pumped system is currently into the Ditch B system. (This outlet would/could be intercepted however by any new drain on the west side of River Road.)

As noted at the on-site meeting the farms west of Hillside Farms in this area are believed to be tile drained to the north to an outlet in the North Canal even though the top waters would drain southeasterly.

4.11 Results of Establishing the Watershed for any New Drainage System along River Road Between Canal Road and Weber Road

As can be concluded from the discussions in subsections 4.5 to 4.10 here, the surface water watershed for any new drainage system along River Road between Canal Road and Weber Road would be the majority of the original survey Lot 5, Concession 2 West Gwillimbury Township, south of the centre of Canal Road, and the majority of original survey Lot 5, Concession 1, West Gwillimbury Township north of Weber Road.

Only the lands in the northwest part of Lot 5, Concession 2 south of Canal Road that are drained by a ditch south to the north-south part of Ditch A (as described in Section 4.10 herebefore) and the lands immediately adjacent to Ditch A would not be in the River Road Drain surface water watershed.

With respect to the subsurface water watershed (i.e. the tiled watershed), such subsurface water or tiled watershed would be, or could be, the same as the surface water watershed

except for those farms on that part of Lot 5, Concession 2 that are tiled north to the North Canal (as also just referred to).

With respect to any watershed to the River Road Drain on the east side of River Road in Lot 6, Concessions 1 and 2, it was concluded that mostly all the lands and roads east of River Road centerline would not be in the watershed even if an outlet for the River Road Drain were taken east along Hillsview Road to the Central River or east along the north parts of the Vonk property to the Central River (Only a small portion of Hillsview Road itself would be in such watershed). Indeed lands east of River Road and north of Hillsview Road either drain to the Ditch B system or to the Central River system directly. Lands on the south side of Hillsview east of River would drain either to a private system on the south side of Hillsview or to the Central River directly. Only if the Ditch B system were used as an outlet for any new River Road drainage could there be land areas on the east side of River Road into the watershed.

The lands and roads listed in the Schedule of Assessment as being in the watershed are the lands and roads described by this section to be in the watershed.

5.0 DESIGN ALTERNATIVES INITIALLY INVESTIGATED

5.1 Alternative Routes

Accordingly, after the on-site meeting, the site examination, the daylighting work, and the study of the various possible routes, ultimately five distinct optional routes were initially developed. Some additional surveying was necessary to develop these and additional drafting and design had to be undertaken for each. The options developed were discussed with the Drainage Superintendent and some of the main properties involved on November 1, 2019 and again on December 3, 2019.

The options developed were initially Alternatives 1 to 4 and then later Alternative 4 Revised and Alternative 5 were prepared. These options as summarized and as presented for the November 1 and December 3 meetings are included in ***Appendix D*** to this report.

With respect to the Petherick lot at the corner of River Road and Canal Road, formal individual alternatives were not developed. The only initial alternative developed was to construct a small diameter closed drain from the head of any channel that was constructed along the road allowance limits between Hillside Farms and River Road northerly towards the Petherick driveway. Sub-options at the Petherick northerly were thought to involve either lowering of the driveway to serve the low area that exists on the north side of the driveway, or to construct some type of a closed drain through the driveway or to construct some type of berming system from the driveway to the Canal Road intersection with discharge into the closed drain on the south side of the driveway.

However, in discussions with the Municipality's Roads Department, it was suggested that an asphalt curb and gutter should be considered on the west side of River Road from the Petherick driveway north to the Canal Road intersection and then for a bit to the west of the intersection to intercept the waters that Petherick has observed crossing Canal Road onto the property.

6.0 DESIGN ULTIMATELY DEVELOPED FURTHER AND PRESENTED TO THE OWNERS AT A SECOND MEETING

Basically the initial design as described as Alternative 4 Modified in the appendix together with the idea of an asphalt curb and gutter on the Petherick property was developed further and presented to the landowners as the primary recommendation.

Two variations to Alternative 4 modified were developed. The first variation with larger diameter closed drains (900mm where needed on Hillsview and 600mm diameter on River Road south of Hillsview) was developed, and costed as, Alternative 6. The second variation with one size smaller closed portions (750mm vs the 900mm and 525mm vs the 600mm) was costed as Alternative 7. The work on River Road north of Hillsview was not different in either Alternative 6 or 7.

Also presented to the landowners was a further new option using Ditch B as the outlet rather than using Hillsview Road east as in Alternatives 6 and 7. This Alternative 8 was developed to explore the lowest cost alternative that could still address the surface water ponding problems. A greater description of this Alternative 8 and a direct comparison between Alternatives 6, 7 and 8 was developed and is repeated here:

Alternative 6 is similar to Alternative 4 as done in December but is updated. It is based on using 900mm (36") dia. culverts on Hillsview East and a 600mm (24") dia. drain on River South as done in December. The work on River North, in this, and in most, Alternative(s), has a ditch as continuously discussed, plus 600mm dia. culverts at the brace poles, at the "crocs" plus curb work at Petherick.
Ditch work on the full extent of Hillsview Road West was included as a future Contract 2.
The Alternative 6 total cost estimate was $867,745.
Since its costs are high, and since it provides perhaps more outlet than needed, a new Alternative 7 was developed.

Alternative 7 is very similar to Alternative 6 but in it, culvert diameters were reduced on Hillsview Road East from 900mm to 750mm and on River South reduced from 600mm to 525mm. Also the majority of the Hillsview West Contract 2 was deleted and replaced with a new short hickenbottom branch to be done at the same time as all other work. Also some other minor changes were made such as to reduce catchbasin/manhole sizes on River South.
Its total cost estimate was $710,125 as initially prepared.
To see if there was any other cheaper option just to address the surface water ponding near River South and to address drainage needs along River North, Alternative 8 was developed.

Alternative 8, as mentioned, is a fairly new option. In this option, the ditch and culvert Ditch B system that exists east of Hillside's buildings across fields of Hillside, Korag and Cho Kai Yen would be the new outlet. This existing system would basically remain as it is but with the addition of a new 600mm pipe from the west side of River Road across the road and across the paved commercial lot of Hillside to the start of the ditch and with twin 450mm pipes across Korag's field, where the ditch has been closed in, to work with the existing submerged 600mm± pipe. All existing work east of Hillside's buildings would be incorporated.

In this new Alternative 8, the work on the west side of River Road North would remain as in Alternatives 6 and 7 except that the south part (from the crocs south to Hillsview) would now drain north to the new 600mm River Road crossing and thus be at a lower elevation.
In Alternative 8, the River Road South component would be reduced to a 450mm pipe drain from the 600mm or 525mm sizes in Alternatives 6 and 7. It would also be shortened since it could not be used in the future to connect Hillside's pumped outlet that exists near Weber Road. The hickenbottom branches would remain.
Hillsview East would be deleted. Hillsview West would still be the short hickenbottom branch that was described to be in Alternative 7.
The total cost of Alternative 8 would be $620,465.
Alternative 8 is the lowest cost option that could be suggested to deal with the surface water problems that exist but it is still costly and provides a fairly reduced level of service.

With respect to the differences in the level of service:

- Alternative 6 would allow all three of Hillside's pumped outlets to be connected, if Hillside wished, (the one that discharges across Canal Road, the one at the crocs leading to Ditch B and the one at the crocs near Weber Road outletting to the River north of Vonk) and would provide a level of service between 38mm and 50mm (1½" to 2") meaning that 38mm to 50mm of runoff (combined tile drain discharge plus top water runoff) could be removed per day assuming the waters could get into the new drain. The 50mm level of service would be on Hillsview East and River North and the 38mm level would be on River South.
- Alternative 7 would also allow for Hillside's pumped outlets to join in and would provide a combined 38mm (1½") runoff for tile and top water on River South provided the Hillsview Road West Branch is designed to work with the River Road South Branch and admits the watershed north of hickenbottom Branch 1. Alternative 7 would provide a combined 38mm (1½") level of service on Hillsview East. River Road North's level of service would also be controlled by Hillsview East and would thus be a 38mm (1½") also.
- Alternative 8 would not provide for any of Hillside's three pumped outlets to be connected but it could remove close to 25mm (1") of top water per day from the watershed if the tile/pumped systems are not joined.

With respect to maintenance, certainly Alternatives 6 and 7 would be more easily maintained. Alternative 8 could be difficult to maintain.

7.0 SECOND SITE MEETING

On August 18, 2020, a second informal meeting was conducted with the landowners. The meeting was conducted at the church parking lot in the northwest quadrant of River Road and Canal Road. The parties present were Frank Jonkman and Ruth Westlake from the Town, Nancy Beckett, Bill Beckett, Nancy Petherick, Ron Scholton, Karen Van Meggelen, Tim Vanderkoi and Paul Luksha, plus Kenn Smart and Curtis MacIntyre.

- Kenn described the three alternatives that he most recently looked at, being Alternatives 6, 7 and 8. He explained that Alternatives 6 and 7 were very similar and only differed in pipe diameter. He explained that both these two Alternatives involved a new combination of open channel and culvert system on Hillsview Road East as the outlet, plus a new pipe drain below the west shoulder of River Road going south and a

new open channel on the west property line of River Road going north, together with culverts at specified locations, plus the work on the Petherick property to involve an asphalt curb and gutter along the edge of road plus one new catchbasin and 300mm (12") pipe to provide an outlet for the well system and the catchbasin system. He explained that Alternative 6 would involve 900mm pipe on Hillsview East where pipe is used and 600mm pipe on River Road South, whereas Alternative 7 would involve 750mm pipe on Hillsview East where pipe is used and 525mm pipe on River Road South.

- The Branch on River Road North would not change and would involve the same size ditch and the same 600mm culverts where necessary.
- He further explained that Alternative 8 that he looked at would involve similar work on River Road South and River Road North but the outlet would use the combination of a ditch and culvert channel that exists and runs east from the Hillside buildings and that has been called Ditch B in this report.
- For Alternative 8, he explained that the pipe on River Road South would have to be smaller and would be a 450mm diameter and that the pipe used in the culvert components of the Ditch B would be 600mm diameter or equivalent.
- He explained the differences in costs and indicated that his recommendation would be to use Alternative 7 since it would provide the required level of service and allow all pumped systems of Hillside to be joined in.
- The comments made from the landowners were as follows:
    - Nancy and Bill Beckett enquired as to where the hickenbottom lead would be in respect to their property, and indicated that they would pass the data on to their son.
    - Ron Scholton indicated that he was satisfied with the work done. He would not wish to see Alternative 8 pursued. He questioned whether Alternative 6 should not be further considered.
    - Karen Van Meggelen indicated that she was also there on behalf of the Verkaik property on the south side of Canal Road and had no further comments.
    - Tim Vanderkoi and Paul Luksha from Hillside Farms also questioned whether Alternative 6 should not be pursued. The Engineer though indicated that there may be some difficulties in obtaining grant money on any drain that is sized to a larger coefficient than the 38mm sizing. He felt that the design standard was equivalent to and even larger than other systems that exist where top waters and tile waters are a concern, and he felt that Alternative 7 would be a satisfactory proposal.
    - Nancy Petherick enquired as to the possibility of having the drain extended further north to perhaps across the driveway, and indicated that she wished to discuss the curb and gutter work further with the Town directly.
    - Costs and assessments were provided.
    - No further discussions occurred and the meeting was adjourned.

8.0 DETAILS OF THE RECOMMENDED WORK

As a result of the surveys, the designs, and the discussions at the meetings, the following is presented as the Recommended Work:

As an overview, the work recommended in this report consists of work starting at the Central River and progressing upstream along Hillsview Road to River Road and then with two components along River Road. There would be the North River Road component and the South River Road component. A fourth component considered would be a short branch drain along the unopened Hillsview Road West. So altogether there would be four components to be constructed: Hillsview Road East Branch, River Road North Branch, River Road South Branch and Hillsview Road West Branch. The details of each follows:

a) Hillsview Road East Branch Component

- Work commences in the Central River generally along, but to the south of, the centre line of the Hillsview Road allowance.
- The elevation of the pipe where it starts in the river is to be elevation 216.33 (50mm lower than a ditch bottom elevation if it were to be a ditch outlet there). The Central River water levels vary from 216.30± (fall to spring) to 216.55± (summer).
- The outlet pipe in the Central River is to have a rodent gate and there is to be 25m² of riprap placed along the bank of the river for protection and also as a splash apron.
- Work then consists of installation of 750mm dia. high density polyethylene (HDPE) piping and continues for 65m± below the road. The work can be considered as either culvert or closed drain work. (Note: All piping on this project has been costed as HDPE pipe.)
- The depth of this length will be approximately 2± metres (m) below the centre of the road and the top width disturbed is expected to be approximately 4.5m to 5.5m.
- The trench will require excavation down to the invert of the new pipe with a minimum of 150mm of excavation below that, and then the installation of clear crushed limestone as bedding and backfill to the top of the pipe, and then the installation of granular materials up to the road surface.
- The excavation for any proposed pipe and its bedding is expected to extend to below existing peat depths (but such can only be confirmed at the time of construction). If peat is lower, additional excavation and bedding material may be necessary
- All road granular materials will be Granular B except for the upper most portion which will be a Granular A material.
- Materials excavated and non-reusable are to be loaded and hauled away.
- Any interfering equipment or materials sitting on the road allowance that are privately owned are to be removed off-site by the landowner. If such are not removed by the landowner, then the drainage project will have to relocate them, at a cost, to an off-site location.
- At a location approximately 65m west of the start of the drain in the Central River, a 1500mm dia. circular concrete maintenance hole is to be constructed to allow for

easier culvert maintenance and to allow the new drain to bend more to the west. The closed drain would then continue to the southeast corner of the Korag Farms property.

- Similar excavation and backfill work for this length will be necessary as it angles below the road bed. Once the drain leaves the road bed but is within the boulevard, then the trench will consist of the same bedding and backfill of crushed stone as on the road allowance, but the balance of the backfill material is to mirror existing conditions and restoration is to match the existing. (Expected to be native non-organics and then a topsoil surface.)
- Any surplus organics or topsoils that can be used as field organics are to be left for the adjacent owner's usage, if the owner wishes, or are alternatively to be loaded and hauled away if the owner does not wish such.
- Any surplus non-organic and non-reusable materials are to be loaded and hauled away.
- This length of closed drainage is to continue further to a location approximately 16m west of the Korag property line to provide the required field entrance.
- The pipe, where below a field entrance, will have to be covered by granular materials to a minimum depth of 0.3m. The uppermost 150mm (0.15m) is to be a Granular A surface. This cover material may have to extend slightly further north than the top of the ditch bank.
- At the location 16m west of the Korag property line, at the end of this portion of closed drain work, a new open drain will commence. At the end of this pipe, and at the ends of all pipes, a small amount of riprap bank protection will be placed.
- The open drain is to consist of a channel with a 1.0m bottom and 2:1 side slopes, and is to be to a depth of approximately 500mm below the field level.
- The centerline of the new open drain will be approximately one metre south of the road allowance/property line (and thus within the road allowance) but the north top of bank of the channel will be approximately 1.5m north of the property line.
- Any surface organics or topsoils (peats) excavated are to be saved and left in a windrow for the landowner's use. Should any of the excavated peat materials not be desired by the owner of the property, they are to be hauled away.
- It is possible all channel excavation will be in the peat/organic strata.
- The new channel then is to be seeded with a low grow Dutch clover. If any part of the channel were in non-organic soils, it would have a thin layer of organics/topsoil spread on it before seeding.
- There is also to be a 1.0m wide buffer strip on the north side of the channel for buffering and maintenance and this too is to be sown with low grow Dutch clover.
- The open channel work is to continue to a point 7.5m± east of the line between Korag Farms and Hillside Farms. At this location, the closed drain/culvert work is to recommence using the same materials as used downstream. The closed drain construction is to continue for 7.5m adjacent to the Korag property and then 7.5m adjacent to the Hillside property as field entrance construction serving both farms.

- The work itself is to be done similar to the work for the portion of closed drain below a field entrance as described on the Korag property in its southeast corner and will therefore consist of crushed limestone bedding and pipe backfill, and with 150mm of Granular A as surface material.
- From the west end of this pipe/culvert, the open drain will continue but now adjacent to the Hillside Farms property. It will be similar to the open channel on the Korag property. Its centerline will be 1.0m± south of the property line, the north top of bank will be 1.0 to 1.5m± north of the property line and there will be a 1.0m wide grassed buffer. Its depth will vary from 600 to 800mm lower than field elevation. All excavation and disposal will be as described on Korag Farms.
- The new channel then is to be seeded with a low grow Dutch clover. If any part of the channel were in non-organic soils, it would have a thin layer of organics/topsoil spread on it before seeding.
- At a point 90m± east of the centre of River Road, which would be 20m± east of the landscaping on the residential property in the southwest corner of the Hillside Farms property, closed drain/culvert work will recommence and will continue to and across River Road.
- The 15 metre east part of this closed work will serve as a field entrance for the Hillside Farms properties with work as described for other pipe/culvert work at field entrances.
- The closed drain work on the residential property will be as described elsewhere for field entrances on the Korag Farms and Hillside properties with the exception that the surface restoration is to consist of a minimum of 150mm of organics/topsoil and then seeding with a residential lawn seed mixture versus a low grow Dutch clover mixture.
- This type of construction will also continue into the River Road allowance until the granular portion of River Road is encountered. Once the granular/asphalt area is encountered, the work is to continue similar to the work where the drain was installed below the granular area of Hillsview Road with full granular bedding and backfill but also with asphalt surfacing.
- The work will continue in the River Road allowance for 6 to 7m± west of the centre of the travelled road to a point where a further 1500mm dia. circular concrete maintenance hole is to be constructed. This maintenance hole is to provide for the junction of the South River Road Branch and for a deflection in the Hillsview Road East Branch. Out of this maintenance hole the Hillsview Branch drain will continue west as 600mm pipe for 6m to the commencement of the open channel component of the North River Road Branch and to where the Hillsview Road West Branch would join.
- All work below River Road is to involve similar construction as described herein for Hillsview Road except for the need of asphalt surface restoration.
- The ultimate restoration of the asphalt area of River Road will involve the placement of 100mm (compacted) of asphalt. This asphalt is to consist of 50mm of HL8 or SP19 base asphalt and 50mm of HL3 or SP12.5 surface asphalt.
- At each end of each closed drain/culvert component on the Hillsview Road Branch, where a ditch empties into a closed drain or where the closed drain empties into the

ditch, the impacted bank is to be protected with a small amount of riprap overlaying filter fabric.

- Along that portion of the Hillsview Road Branch where a 25mm diameter water line exists to the north (2.0 to 2.5m north) of the new bank of the new channel, care will be necessary to avoid and not damage the waterline over most of its route. However, the new channel will cross the water line in two locations. At each of these locations the water line is to be temporarily shut down, and the line is to be lowered and/or replaced at a lower elevation. Where removed, it is to be recoupled using splice materials compatible with the existing water line materials.
- After finishing any new water line work, disinfection and pressure testing is to occur. Lowering the line only, would not require this work to be done.
- Lastly it is to be noted that all pipe/culvert components are to be constructed such that the invert of the pipe is 50 to 100mm below the design grade as described for the channel.

b) River Road North Branch Component

- This component commences as an open channel at the top end of the Hillsview Road East Branch.
- The open channel will run parallel to River Road and its centerline is to vary from 0.5m± west to 0.5m± east of the west limits of the River Road allowance (its west property line).
- The portion north of Hillsview Road is to have its centerline 0.5m east of the west property line, the mid-length portion where pipe/culvert work is necessary is to have its centerline 0.5m west of the property line and then the north portion up to the Petherick property is to have its centerline centered on the property line.
- The open channel will vary from 400± to 800mm± below the field level and is to have a 1.0m wide bottom with 2:1 side slopes and will thus have a top width varying from 2.5m± to 4.0m±. The west bank of the channel will vary from 1.2 to 2.2m± west of the road allowance.
- The majority of the open channel is expected to be excavated fully within peat materials and surplus peat materials are to be made available to the landowner if required, and if not required are to be hauled away off site and disposed of.
- The northerly half of the channel will extend below peat into the underlying clayey silts.
- Any non-organic materials excavated are to be hauled away and disposed of off site.
- Upon completion of excavation, the channel is to be seeded with a low grow Dutch clover mixture.
- As described on the Hillsview Road East Branch, there is to be a seeded 1.0m wide buffer strip adjacent to the channel on the field side. This seed is also to be low grow Dutch clover.
- Any part of the channel excavated in non-organic materials is to have a thin depth of organics spread on the banks prior to seeding.

- This open channel construction will exist from Hillsview Road 700m± north to a laneway that exists just to the south of the Petherick property.
- However, in this length of open channel, five pipe/culvert installations are to be made.
- Three of these installations are to occur at hydro brace pole locations and at each of these brace pole locations, the culvert is to be a 6m length of 600mm diameter pipe (high density polyethylene tubing). As necessary, guy wires will have to be removed and reset. The brace poles will have to be temporarily supported if necessary. The backfill is to be similar to a field entrance.
- The fourth culvert in this stretch will be at the "croc" location on the Hillside Farms property. Here the culvert length is to be 12m and is to be with similar materials and methods as used at brace pole locations. One brace pole and guy also exists in this location.
- The pumped outlet leading from the croc across River Road is to be outletted at this new culvert.
- The last (fifth) culvert in this channel will be to replace the field entrance culvert that exists just south of the Petherick property. The new culvert here will be 9m in length and of similar materials.
- The lane above the existing culvert at this fifth location is to be reconstructed to match its existing condition. The old pipe is to be removed and disposed of off site.
- The bedding and backfill to each culvert is to consist of crushed limestone materials as described on the Hillsview East Branch for the closed drain/culvert work, then the balance of the backfill is to be native non-organic materials or granular materials (depending on the purpose of the laneway). The excavation will have to extend to the base of the peat material even if deeper than the excavation for the 150mm of bedding.
- Riprap material is to be placed at each end of each culvert.
- Adjacent to the Petherick property, the River Road North Branch work is to continue and is to involve a short length of closed drain work and then the construction of an asphalt curb and gutter along the west edge of River Road and the south edge of Canal Road.
- The closed drain work is to consist of 300mm dia. HDPE plastic materials at a depth of 1.2 to 1.3mm±. The installation will involve the removal of any peats, the construction of bedding and backfill using crushed limestone, and then the balance of the backfill will be with approved native materials to mirror existing materials and thicknesses.
- Surface restoration is to consist of 150mm minimum of topsoil/organic materials and then seeding with residential lawn seed mixture.
- The location of this 300mm closed drain is to be at or just east of the road's west property limits.
- The 300mm closed drain is to join to a new 600 x 600mm concrete catchbasin. At this catchbasin, a short lead is to run to the existing overflowing artesian well on the Petherick property. The lead to this well is to consist of 9m± of 150mm tubing and is to be constructed such that the overflow from the well which currently is directed into a private tubing proceeding westerly, is redirected into this new 150mm tubing.

- Also a tubing that currently encircles the existing well is to be joined up to this new 150mm tubing leading to the new catchbasin.
- The 300mm diameter closed drain is to continue for a further 15m north of the catchbasin to the south side of a driveway with a capped end (This 15m portion will not be part of the drain for future maintenance). Should the landowner wish to continue the pipe northerly across the driveway such could be done by the landowner.
- With respect to the asphalt curb and gutter, such will start 15m± south of the south edge of the laneway going into the Petherick property. It will commence with a gutter outlet that angles towards the new catchbasin so that the waters it carries can discharge towards the new catchbasin. A riprapped (stone) apron will be constructed along the 4m length between the gutter outlet and the catchbasin.
- The asphalt curb and gutter is to be in accordance with Ontario Provincial Standard Drawing (OPSD) 601.010 and will be 800mm wide with a 50mm deep "V" shaped gutter and 100mm high back side. It is to be generally adjacent and flush to the asphalt throughout.
- If the Contractor wishes, and if the Town agrees, to construct this curb and gutter with concrete rather than asphalt, OPSD 600.030 will apply to give a similar curb and gutter.
- The new curb and gutter will continue along Canal Road to opposite the west side of the Petherick house.
- 15m of the gutter of this new curb and gutter near its westerly end will be slightly lower than provided for by the OPSD so that a continuous grade is provided in the new asphalt gutter.

c) River Road South Branch Component

- The South River Road Branch component will commence at the maintenance hole that is to be located in River Road on the Hillsview Road East Branch six metres from its top end.
- The River Road South Branch is to be a 525mm dia. closed pipe drain throughout.
- It is to run south for approximately 430m.
- It is to be located approximately 1.7m± west of the west edge of asphalt on River Road so that it is 2m± east of the pole line that exists.
- Trench construction would be similar to trenches on Hillsview East with the bedding and backfill to be crushed limestone and with compacted granular backfill to the road shoulder or driveway surfaces. Surplus materials would be hauled.
- At five locations along this route, concrete catchbasins with birdcage grates are to be constructed at 75 to 105m± spacing for maintenance purposes. Generally these catchbasins are to be constructed along the edges of the residential or commercial properties that exist on the west side of the road. The basins are to be constructed so that their surface is flush with the "finished grades". These maintenance holes are to be 900 x 1200mm± concrete structures. Steel bar birdcage grates (100 to 150mm high) are to be used at the top of the basins.

- Out of four of these basins, a branch "hickenbottom" drain is to be constructed. Each of these branch drains is to be constructed of 200mm diameter plastic tubing with filter sock, and is to be installed like other components of closed drain work, with crushed limestone bedding and backfill, except there is to be replacement of all peat surface materials above the pipe backfill, with grading to match the existing surface.
- At the end of each of these hickenbottom branch drains, a 200mm diameter hickenbottom is to be constructed to admit surface waters. Each hickenbottom is to be wrapped with a geotextile filter fabric and a small "cone" of 50mm crushed stone is to be constructed around the base of the exposed portion of each hickenbottom.
- The purpose of the branch hickenbottom drains is to help drain the surface waters that build up on the fields in low areas behind the residential/commercial lots.
- These hickenbottom branches will be shallow in the fields especially near the location of the hickenbottoms. Cover of only 200 to 250mm± can be expected at the top end of two of these branches. The landowner is encouraged to grade any other low part of the fields to the hickenbottoms.
- These are to be called Hickenbottom Branches 1 to 4.
- The Branch 1 Drain (HB 1) running west along Parcel 006-03301 to the north of the buildings on Parcel 006-03302 is to be 42m in length.
- The Branch 2 Drain (HB 2) running west along Parcel 006-03302 to the north of the buildings on Parcel 006-03304 is to be 43m in length.
- The Branch 3 Drain (HB 3) running west along Parcel 006-03303 to the north of the Beckett property is to be 66m in length.
- The Branch 4 Drain (HB 4) running west along Parcel 006-03305 to the north of the buildings on this parcel is to be 66m in length. A portion of this length will be at the east frontage of this parcel as it leaves the manhole.
- At the most southerly basin, a capped 525mm stub is to be left. This stub could be connected to by the landowner if desired to provide a second or alternative outlet for drainage from the pumped drain system 160m± to the south. Any pipe used to connect the system would have to be placed at a minimum grade since only 150 to 200mm± difference in elevation is expected to exist between the stub and the existing drainage outlet.

d) Hillsview Road West Branch

- This Branch is designed to date as twin 300mm plastic tubing drains, each 50 metres in length and with a 250mm dia. hickenbottom at the top end of each.
- The tubings will extend from the junction of the River Road North Branch and Hillsview East Branch (at the mouth of the new 600mm culvert) to the low area 50m west of the River Road allowance.
- At this approximate location there is a field entrance off River Road to the Hillside farm fields and the final configuration and location of this Branch should be set to fit with the needed long term location of this field entrance.

- Desirably the 300mm drain could be converted to 300mm HDPE piping rather than plastic tubing below the field entrance and then at the limit of the field entrance, the 250mm dia. hickenbottoms could be constructed.
- Then from these revised hickenbottom locations, a shallow swale could be graded over the balance of the 50m length to the low area.
- A review with the landowner, re the final components of this short branch, should be made once the field entrance particulars are confirmed.
- The design and costing using full 50m lengths of 300mm pipings will be implemented unless a more acceptable approach is deemed appropriate.

e) Retaining Existing Pumped Drainage Outlets

- These three pumped outlets are:
    - The pumped outlet that exists just north of Weber Road and that uses a 400mm pipe outlet across River Road and east to the Central River.
    - The pumped outlet to the 150/200mm pipe across River Road that continues to what is called Ditch B.
    - The small ditch on the north part of Hillside Farms south and west of the Petherick lot that is pumped north across Canal Road
- Although it will be a decision of the landowner(s), it is recommended that the three existing drainage outlets serving the Hillside properties remain such that they could be used even after the construction of the works in this report and even if all the lands served by the existing pumped systems are given new outlets to the River Road Drain.
- The retention of the existing outlets would provide backup and additional capacity in all cases if needed.
- However, all existing pumped outlets could be abandoned and joined to the new drain if the landowner wishes.

9.0 AUTHORITY FOR THIS REPORT

The petition for this Report was signed by the individual responsible for roads in the Town of Bradford West Gwillimbury. It was determined that any drainage system that exists along River Road (which is a Bradford West Gwillimbury road) is not adequate where such exists and in many portions there are no drainage systems existent. It was determined that the existence of River Road prevents normal surface flow across the lands from a west to east direction into the Central River and this is the reason for surface ponding on lands to the west. It was concluded that some type of a drainage system is necessary along and/or downstream of River Road to ensure that the lands to the west have their historic drainage route restored, and also to ensure that any existing system on River Road is taken to a better outlet.

Since the petition was signed by the individual responsible for Bradford West Gwillimbury roads, it has been deemed that the petition is sufficient in accordance with Section 4(1)(c) of the Drainage Act.

10.0 WATERSHED

It was determined that the watershed consists of River Road and lands on the west side of River Road. Although the outlet for the work on River Road is taken along Hillsview Road, there is in effect no additional lands that would be in the watershed adjacent to the construction along Hillsview Road other than a portion of the Road itself.

Sections 4.8 to 4.11 of this Report discuss the watershed considerations. The watershed as determined is shown on Drawing 1 of this report. It consists of 68.3± hectares of lands and 2.0 ha of roads.

11.0 ITEMS CONSIDERED IN DESIGN STAGE

The following is a summary of the various matters that have been discussed and that were considered in arriving at the recommendations in this report:

11.1 Existing Irrigation Lines

As noted, it was found that a 300mm to 250mm diameter irrigation line exists fully on the east side of River Road in the area where drainage was originally desired south of Hillsview. It was found that this line has a crossing of River Road near the south limits of the Hillside property and has a main that continues west from this crossing.

It was also found that there is a short length of 200mm diameter irrigation line on the south side of Hillsview Road from the Central River west for approximately 100m.

It is believed that if at all possible, work should be undertaken to minimize disruption of an irrigation line. Irrigation line construction work is costly and the timing of the work has to be at a time when irrigation is not necessary. If any construction problems develop, the effects could be long reaching later. Therefore, if at all possible, work should be done to minimize irrigation line disruption.

11.2 Water Lines

Two water lines were exposed. One is on the west side of River Road from Hillsview Road generally southerly and serves the four lots that exist on the west side of the road. The second line is along Hillsview Road on the north side to serve lots on both sides of the road.

It was found that both water lines by themselves would not preclude construction of drains adjacent to them.

It was determined that reconstruction of two service line road crossings on the Hillsview line would be necessary for any drain work along Hillsview Road. However, since the water lines are of small diameter, the work could readily be undertaken.

11.3 Outlet Availability

All the watershed lands, with exception of those northerly lands that are pumped to the Holland Marsh Drainage System North Canal, are served by the Central River. This is historically known as the Central Holland River but since the 1930's has been a component of the Holland Marsh Drainage System. It is known that its level is maintained within a very close range during the summer months so that both drainage and irrigation use of the River can be made.

The Central Holland River does offer an adequate outlet in terms of capacity since it is maintained by the Art Janse Pumping Station further downstream. Also the Bardawill Pumping Station, which is not too distant from the River Road area, acts as an auxiliary pumping system to maintain levels in the Central River.

Storms of significant magnitude can be handled by the two pumping systems.

Certainly any outlet for road and land drainage considered herein is sufficiently available in the Central River.

However, due to the flatness of the lands within the Holland Marsh, and due to the level at which the Central River is maintained, only minimal gradient and depth are available for any drainage system that outlets into the Central River. It was necessary therefore to prepare the design using very low gradients for the ditch/pipe system and also with shallow depths.

11.4 Environmental Considerations

One of the most significant concerns in the Holland Marsh is to ensure that activities do not result in a loss of flood storage within the Holland Marsh polder. This would result from any significant berming or land raising. Since berming or land raising is not a component of this project, loss of flood storage would not be an issue. Actually a limited additional flood storage will be provided by any new channel construction.

A further concern is that when drainage works are constructed in the polder, sediment discharge into the receiving Central River waters be controlled. The work in this report will have very low gradients of open channel work and the open channel work is expected to be within the peat stratum and as a result erosion and sediment transport downstream is anticipated to be minimal.

The only further concern that could exist would be the disruption of the banks of the Central River when the new outlet is constructed. This has been recognized by this report and riprap protection is included in the report's design for stabilization of the banks where cut at the outlet.

To act as backup for sediment transport, although such is expected to be minimal, six straw bale dams or silt fence dams are to be constructed in the new open channels until stabilization has occurred. Also all new open channels are to be seeded upon completion. Projects in the Holland Marsh area are seeded with what is called a low grow Dutch clover, which does not impact agricultural operations, and which does not require substantial maintenance after its growth.

11.5 Utilities

The first utility that is evident and that could be encountered is overhead hydro. It exists along the east side of River Road between Canal Road and Hillsview Road, with scattered brace poles to the west, and then on the west side of River Road to the south of Hillsview Road. Along Hillsview Road the Hydro line is on the south side.

Overhead hydro should not be a problem except on the River Road North Branch. Here at the hydro brace pole locations on the River Road North branch, the ditch will be enclosed with culverts so the stability of the poles themselves will not be impacted.

The other utility evident is underground Bell. It is believed that a Bell line exists on the west side of River Road from Hillsview southerly and then on the east side of River Road from Hillsview northerly. Along Hillsview, the Bell line is expected to be on the south side.

Neither the Hillsview East Branch nor the River Road North Branch should affect Bell. On the River Road South Branch, the 525mm pipe work will be east of the Bell line but the five hickenbottom branches will cross the Bell lines. It is expected that the crossings of the Bell line should however be conventional with customary exposure and protection of the lines where crossed.

Throughout the project, underground Bell is to be pre-located by One Call to verify its existence and the expected impacts.

12.0 PRIVACY OF LANDS

This proposed municipal drain is to be constructed primarily within road allowances with impact on noted immediately adjacent lands. There is no right for any landowner to enter onto another landowner's property where any part of the system is on private lands. Only the appointed Town Drainage Superintendent (or the Superintendent's assistants) as part of maintenance of the drain, the Engineer (or the Engineer's assistants, i.e. survey and inspection crew) as part of the work with respect to this report and the selected/ approved Contractors (or their assistants) for construction and future maintenance of the drains (branches), have the right to enter onto privately owned lands of others.

13.0 DRAWINGS AND SPECIFICATIONS

13.1 Drawings

The overview location of the components of the River Road Drain, the watershed boundary and the affected properties and roads are shown on Drawing 1 (the Watershed Plan). The numbers adjacent to each portion of the drain are station numbers which indicate in metres the distance along each portion.

Drawings 2, 10, 19 & 31 are the overall profiles that show the depth and grades of each branch of River Road Drain. These profiles would also apply for future maintenance.

Drawings 3 to 7, 11 to 15, 20 to 25 and 32 are the plan and profile enlargements of each branch of the River Road Drain.

Drawings 8 & 9, 16 to 18 and 26 to 30 contain the typical cross-sections.

Drawing 33 shows typical trench soils photos to be expected for the closed portion components.

Drawing 34 contains the applicable OPSD, and other detail drawings.

13.2 Specifications

Appendix E attached to this report contains the Extent of Work, Item Special Provisions (ISP's), General Special Provisions (GSP's), and Supplemental Conditions (SC's).

The standard KSAL specifications are also attached after Appendix E (applicable where not superseded by Appendix E).

All of the above are to govern the construction and maintenance of the drain.

14.0 COST ESTIMATE

Any cost estimate done for a Drainage Act project customarily consists of the fixed cost Allowances for right-of-way and land damages necessary to be made to owners of private lands having work on their properties (if any), the Construction cost estimate including labour, materials and equipment costs and including a contingency allowance, the Engineering cost estimate to prepare and process the Report, an estimate of the Engineer's construction supervision and administration services, and an estimate of the eligible municipal Administration costs which can include allowances for financing, approvals, applications and miscellaneous costs. The eligible municipal administration cost estimate also includes an HST allowance (1.76% on drains as opposed to normal 13%). These are further described in the following sections:

14.1 Allowances

i) General

Sections 29 to 33 of the Drainage Act provide for allowances (compensation) to be made to private landowners affected by proposed drain construction. On this project, there are to be only allowances for Section 29 Right-of-Way (R-O-W) and Section 30 (Damages to crops, etc.). It should also be noted that allowances are not made to Municipalities for work on municipal roads or lands.

ii) Section 29 – Right of Way

Section 29 of the Drainage Act can provide for the payment of allowances to private landowners for lands taken to accommodate expanded or new drainage work features on their properties. As well, Section 29 can provide for payment of allowances to compensate private lands to be used for construction and maintenance access to and along the

drainage works, which is also called a "right-of-way" to and alongside the drainage works for construction and maintenance purposes.

The calculation of allowances for land taken in the Marsh area is based on a current land value of $60,000 per acre ($150,000/ha).

The calculation of allowances for lands used or ROW for an open drain on this project on agricultural land is based on the determination of the principal (allowance) that should be given now, that will generate a sufficient interest annually to compensate for the damages resulting from the drain being in place. The width used in each property's calculation is based on the width of land lost that has been previously cultivated. An interest rate of 3% was used in the calculation on this project, and an annual damage rate of $7,500/ha or $3,000/acre was used.

The calculation of allowances for lands used or ROW for a closed drain (the hickenbottom branches on this project) on this project on agricultural land is based on the determination of the principal (allowance) that should be given now, that will generate a sufficient interest annually that if and when accumulated will compensate for the damages when the R-O-W is used. A frequency of maintenance of 15± years and an interest rate of 3% were used in the calculation on these branches.

Where a residential lot is affected by drain construction and/or its maintenance, the Section 29 allowance for R-O-W on this project is the principal to generate, at an interest rate of 3%, sufficient funds to cover damages of $20 per square metre ($20/m²) at a 15 year frequency.

iii) Section 30 (Damages)

Section 30 of the Drainage Act provides for the payment of allowances to landowners where lands and/or crops of private landowners within the working area/right of way are impacted by the construction of the drain. These allowances compensate the owner for damages caused by the initial construction of the drainage work (eg. damages caused by the construction equipment moving within the R-O-W and by the placement of any excavated spoil within or beyond the R-O-W). Section 30 allowances are also made for land and crop damages along access and right-of-way (ROW) routes during construction where justified.

Section 30 (Damages) allowances to agricultural lands are provided in accordance with the rates as shown in the table below.

Land Use	**Land Damages**
Cultivated Marsh Farm Lands (Carrots, Onions and similar)	$ 7,500/ha ($3,000/ac)

If a residential lot is affected by drain construction, the Section 30 allowance in this project is based on the rate of $20/m² representing a repeat of restoration, if necessary, even though the project will do the initial restoration.

Note: There is a minimum amount of $100 for right-of-way and damage allowances.

iv) General

In accordance with Section 62(3) of the Drainage Act RSO 1990, the allowances to be paid and as shown, may be deducted from the final assessment levied. Payment to any owner would only be made when the allowance is greater than the final net assessment. The allowances are a fixed amount and are not adjusted at the conclusion of construction. Allowances can only be changed if the report is modified prior to adoption of the report by bylaw or in accordance with the paragraph in this report that deals with changing the scope of work after the bylaw is passed.

iv) Table of Allowances

The allowances payable to the owners entitled thereto on this project are therefore as follows:

Table 14.1-1 - Allowances

Roll No.	Owner	Section 29 Land Taken	Section 29 ROW	Section 30 Damages	TOTAL
Hillsview Road East Branch					
006-044	Hillside Gardens Ltd.	13,000	25,000	1,000	39,000
006-055	Korag Farms Ltd.	9,000	25,000	1,000	35,000
	Sub Total	22,000	50,000	2,000	74,000
River Road South Branch					
006-03301	Hillside Gardens Ltd.	0	1,075	425	1,500
006-03302	Hillside Gardens Ltd.	0	1,100	450	1,550
006-03303	Jay-Dee Gardens Ltd.	0	1,700	675	2,375
006-03305	Carron Farms Ltd.	0	1,125	450	1,575
	Sub Total	0	5,000	2,000	7,000
River Road North Branch					
006-032	N. Petherick	0	1,750	750	2,500
006-033	Hillside Gardens Ltd.	36,000	30,000	1,000	67,000
	Sub Total	36,000	31,750	1,750	69,500
TOTAL ALLOWANCES:		58,000	86,750	5,750	**150,500**

Note: All work on Hillsview Road West Branch will be within a municipal road allowance, so no allowances are provided for this branch.

14.2 Construction Cost Estimate

The estimated cost of Labour, Equipment and Materials to construct the proposed drain is outlined in detail in Estimated Costs Summary in Table 14.6-1. The construction cost estimate is based on recent costs for comparable work. Provisional and/or contingency allowance amounts are included, and can be applied against additional work items that may be required due to unexpected field conditions or minor alterations to the project.

14.3 Engineering Cost Estimate

Engineering costs for the Report Phase services include all suvey, drafting and option preparation and evaluations, the report preparation and to attendance at the Council meetings to consider the report and to conduct the Court of Revision

The Construction Phase Services may include: preparing tender documents and tender call, review of tenders, attending the pre-construction meeting, periodic construction inspection, payments, final inspection, post-construction follow-up, the final cost analysis, providing assistance to the Municipality during report processing if such is required, final cost analysis and the preparation and submitting of the grant application.

The cost shown for Report phase work is usually not altered at the conclusion of a project unless the report is referred back or the report is appealed to an appeal body such as the Drainage Tribunal, either of which would result in additional costs. The amount shown for meetings however is an estimate. The final cost for meetings will be based on the actual time required for meetings.

The estimate shown for Construction phase services is based on past experience and assumes good construction conditions and a Contractor who completes the construction in an efficient manner and assumes a reasonable assistance being required by the Engineer to assist the Municipality and to attend to post construction finalization. The final cost for the construction phase services will be for the actual time spent during and following drain construction.

Engineering costs are summarized in Table 14.6-1.

14.4 Estimate of Section 73 Administration (Other) Costs

Section 73(1) of the Drainage Act outlines that the following costs incurred by a municipality can be included in the cost of the drain: “cost of any application, reference or appeal and the cost of temporary financing.” However, Sections 73(2) and 73(3) of the Act state that the cost of services provided by municipal staff and Council to carry out the Act process can not form part of the final cost of the drain.

An estimate of Administration Costs is included to cover the above referenced items from Section 73(1) and primarily provides for interest charges on financing the project until it is completed.

This administration cost estimate may not be adequate to cover legal or engineering costs incurred by or assessed to the municipality should the project be appealed beyond the Court of Revision though such costs normally form part of the final drain cost.

The policy for Provincial Grant purposes indicates that municipal costs for photo-copying and mailing required to carry out the required procedures under the Act can be included in the drain cost estimate.

Section 73 costs are summarized in Table 14.6-1.

14.5 Harmonized Sales Tax

The Harmonized Sales Tax (HST) will apply to most costs on this project. The Municipality is eligible for a significant refund on HST paid. The resulting net 1.76% HST is included in the cost estimates of this report.

14.6 Estimated Cost Summary

The following is the estimated cost summary for all work.

Table 14.6-1 – Estimated Cost Summary

Description								Total Cost
Item	Stations	ISP No.	Description	Unit	Quantity	Unit Price	Cost	
ALLOWANCES (From Table 14.1-1) (Note: These are "fixed" allowances and therefore are not "estimates"):								**$150,500**
CONSTRUCTION COST ESTIMATE								
i) Hillsview Road East Branch								
1	005	3	Shot rock riprap at pipe outlet	m²	25	100	$ 2,500	
2	005 to 070	1 (1.03 Specific)	750mm dia. pipe drain including bedding, backfill, disposal work, granular road restoration and including relaying or placing new 7m of intercepted 100mm drain.	m	65	450	29,250	
3	070	4	1500mm dia. concrete maintenance hole complete including connections (MH 1)	each	1	8,500	8,500	
4	070 to 111	1 (1.04 Specific)	750mm dia. pipe drain including bedding, backfill, disposal work, granular road, entrance and field restoration	m	41	415	17,020	
5	111 to 234	2 (2.03 Specific)	Open drain construction including excavation, disposal work, and seeding preparation	m	123	90	11,070	
6	234 to 249	1 (1.05 Specific)	750mm dia. pipe drain including bedding, backfill, disposal work, entrance and field restoration	m	15	370	5,550	
7	249 to 575	2 (2.03 Specific)	Open drain construction including excavation, disposal work, and seeding preparation	m	326	90	29,340	
8	575 to 650	1 (1.06 Specific)	750mm dia. pipe drain including bedding, backfill, disposal work, topsoil, seeding preparation, tree work	m	75	370	27,750	

Description								Total Cost
Item	Stations	ISP No.	Description	Unit	Quantity	Unit Price	Cost	
9	650 to 673	1 (1.07 Specific)	750mm dia. pipe drain including bedding, backfill, disposal work and road restoration, excluding asphalt	m	23	350	8,050	
10	673	4	1500mm dia. concrete maintenance hole complete including connections (MH 2)	each	1	8,500	8,500	
11	673 to 679	1 (1.08 Specific)	600mm dia. pipe drain including bedding, backfill, disposal work and road restoration, excluding asphalt	m	6	320	1,920	
12	285± & 475±	5	Expose, protect, lower and/or reconstruct as necessary 25mm dia. water line at crossed locations	each	2	1,000	2,000	
13	651± to 673	6	Asphalt restoration of road areas	m²	80	50	4,000	
14	050± to 652	7	Hydraulic seeding and mulching of field and lawn areas including the 1m buffer strip *	m²	3,000	0.50	1,500	
15	Various	3	Shot rock riprap on geotextile at culvert ends (five locations)	m²	25	100	2,500	
16	Various	12	Straw bale dams or silt fences in new ditch	each	2	250	500	
			Sub Total Part i)				**159,950**	**$159,950**
ii) River Road South Branch								
17	000 to 074	1 (1.09 Specific)	525mm dia. pipe drain including bedding, backfill, disposal work, granular shoulder work, 10m of gravel entrance restoration and preparation for seeding elsewhere	m	74	230	$17,020	
18	074	8	900 x 1200mm catchbasin including connections (MH 3)	each	1	3,500	3,500	

Description								Total Cost
Item	Stations	ISP No.	Description	Unit	Quantity	Unit Price	Cost	
19	074 to 179	1 (1.09 Specific)	525mm dia. pipe drain including bedding, backfill, disposal work, granular shoulder work, 50m of gravel parking area restoration and preparation for seeding elsewhere including for 20m of lawn area	m	105	230	24,150	
20	179	8	900 x 1200mm catchbasin including connections (MH 4)	each	1	3,500	3,500	
21	179 to 273	1 (1.09 Specific)	525mm dia. pipe drain including bedding, backfill, disposal work, granular shoulder work, 45m of gravel parking area restoration and preparation for seeding elsewhere including for 20m of lawn area	m	94	230	21,620	
22	273	8	900 x 1200mm catchbasin including connections (MH 5)	each	1	3,500	3,500	
23	273 to 364	1 (1.09 Specific)	525mm dia. pipe drain including bedding, backfill, disposal work, granular shoulder work, 10m of gravel parking area restoration and preparation for seeding elsewhere including for 35m of lawn area	m	91	230	20,930	
24	364	8	900 x 1200mm catchbasin including connections (MH 6)	each	1	3,500	3,500	
25	364 to 432	1 (1.09 Specific)	525mm dia. pipe drain including bedding, backfill, disposal work, granular shoulder work, 37m of gravel parking area restoration and preparation for seeding elsewhere including for 31m of lawn area	m	68	230	15,640	
26	432	8	900 x 1200mm catchbasin including connections (MH 7)	each	1	3,500	3,500	

Description								Total Cost
Item	Stations	ISP No.	Description	Unit	Quantity	Unit Price	Cost	
27	073	1 (1.15 Specific)	200mm dia. perforated tubing with sock including one 200mm dia. hickenbottom with wrap and cone, bedding, backfill and field restoration (HB 1)	m	42	35	1,470	
28	179	1 (1.15 Specific)	200mm dia. perforated tubing with sock including one 200mm dia. hickenbottom with wrap and cone, bedding, backfill and field restoration (HB 2)	m	43	35	1,505	
29	273	1 (1.15 Specific)	200mm dia. perforated tubing with sock including one 200mm dia. hickenbottom with wrap and cone, bedding, backfill and field restoration (HB 3)	m	66	35	2,310	
30	364	1 (1.15 Specific)	200mm dia. perforated tubing with sock including one 200mm dia. hickenbottom with wrap and cone, bedding, backfill and field restoration (HB 4)	m	69	35	2,415	
31	072±, 276±, 391±	9	Work at irrigation pipe crossing locations, with support, protection and/or reconstruction	each	3	500	1,500	
32	414 to 421	6	Asphalt restoration	m²	30	50	1,500	
			Sub Total Part ii)				**127,560**	**$127,560**
iii) River Road North Branch								
33	000 to 695 (including culvert locations)	2 (2.04 Specific)	Open drain construction including excavation, disposal work, seeding preparation, old concrete pole bank protection removal, recessing existing riprap, road embankment reconstruction where necessary	m	665	90	$59,850	
34	255 to 267	1 (1.10 Specific)	600mm pipe drain including bedding, backfill, disposal work, and protection of pole, of irrigation crocs and of	m	12	320	3,840	

Description								Total Cost
Item	Stations	ISP No.	Description	Unit	Quantity	Unit Price	Cost	
			irrigation/drain lines					
35	255 to 267	10	Removing and sealing of existing 250mm drain line that exists from croc to east side of new drain	each	1	500	500	
36	323±, 410±, 478±	1 (1.11 Specific)	6m of 600mm pipe drain at brace pole locations, including bedding, backfill, disposal work, laneway grading, removing and resetting guy wires as necessary, protection of poles	each	3	2,500	7,500	
37	695 to 704	1 (1.12 Specific)	600mm pipe drain including removal of existing culvert, bedding, backfill, disposal work and lane restoration	m	9	320	2,880	
38	695 to 727	1 (1.13 Specific)	300mm dia. pipe drain including bedding, backfill, disposal work, and preparation for seeding	m	32	75	2,400	
39	712	8	600 x 600mm concrete catchbasin with birdcage grate and connections (CB 1)	each	1	2,500	2,500	
40	712	1 (1.14 Specific)	150mm tubing to intercept well overflow drainage and wall perimeter pipe including disconnections, connections and apron work	each	1	1,500	1,500	
41	712 to 713	3	Riprap swale and apron including excavation, disposal work	m²	6	100	600	
42	713 to 804	11	Asphalt curb and gutter including outlet (OPSD 601.010) and including small adjacent earth berming	m	91	150	13,650	
43	Various	3	Shot rock riprap at pipe/culvert ends (10 locations)	m²	30	100	3,000	
44	000 to 728	7	Hydraulic seeding and mulching of field and lawn areas including the 1m	m²	4200	0.50	2,100	

Description								Total Cost
Item	Stations	ISP No.	Description	Unit	Quantity	Unit Price	Cost	
			buffer strip*					
45	Various	12	Straw bale dams or silt fences in new ditch	each	3	250	750	
			Sub Total Part iii)				**101,070**	**$101,070**
iv) Hillsview Road West Branch								
46	000 to 050	1 (1.16 Specific)	Twin runs of 300mm dia. perforated tubing with sock including two 250mm dia. hickenbottoms and including rodent gates	m	100	65	6,500	
			Sub Total Part iv)				**6,500**	**$6,500**
iv) Contingencies								
47		GSP 50	Lump sum contingency allowance (10%)	L.S.	1	39,330	**39,330**	**$39,330**
TOTAL CONSTRUCTION COST ESTIMATE (Total Parts i to iv):								**$434,410**
*Note: Any hydraulic seeding and mulching necessary on River Road South Branch will be measured and paid using Items 14 or 44.								
ENGINEERING COST ESTIMATE:								
			Report Preparation				$60,000	
			Consideration of Report Meeting				1,000	
			Court of Revision Meeting				1,000	
			Construction Phase Services				75,000	
TOTAL ENGINEERING COSTS ESTIMATE:								**$137,000**
SECTION 73 (OTHER) COSTS ESTIMATE (ADMINISTRATION):								
			Printing				$ 500	
			Agency Fees (LSRCA/MECP/MNRF)				500	
			Interest estimate				15,000	
			Unforeseen costs				12,000	
			Net HST (1.76%)				10,000	*
TOTAL SECTION 73 (OTHER) COSTS ESTIMATE:								**$38,000**
TOTAL ESTIMATED COST, EXCLUSIVE OF ALLOWANCES:								**$609,410**
TOTAL ESTIMATE WITH ALLOWANCES:								**$759,910**

15.0 ASSESSMENTS

The Drainage Act requires that the total estimated cost of a Project be assessed to 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/or Special Assessment (Section 26) as applicable. On this project, only assessments for Benefit and Outlet Liability are involved.

15.1 Benefit Assessments

The first step in the assessment calculation is to determine the benefit assessment to the parcels that derive benefit from the drain. The definition of benefit in the Drainage Act is as follows:

> *"the advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages related to the betterment of lands, roads, buildings or other structures."*

Benefit assessments were initially estimated as a percentage of the total project cost (95%± on this project) but were finally evaluated on the basis of better use of the land through improved surface drainage and/or improved subsurface drainage, of increases in market value and/or of facilitated ability to connect other drainage directly to the new drain.

15.2 Outlet Liability Assessments

After deducting benefit assessments, the balance of the cost is then assessed as outlet liability on a per hectare basis to all lands and roads in the watershed. Section 23(1) of the Drainage Act states:

> *"Lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek or watercourse, may be assessed for outlet liability."*

As noted, the hectares affected are adjusted prior to calculating the outlet liability. The basis for this adjustment is 1 hectare of cleared agricultural land contributing both surface and subsurface water to the drain. Areas which generate greater runoff such as roads are increased by a factor (1.5 for gravel roads and 2.0 for paved roads) and areas which generate lesser runoff such as woodlots (bush) and areas that are tiled elsewhere with no provision for change are decreased by a factor of 0.5. These adjustments were used for the calculations in Appendices A and B.

15.3 Schedule A – The Assessment Schedule for Construction

The estimated (and final) cost of the drainage works in this report is to be assessed as shown by Schedule A, Schedule of Assessments for Construction.

In Schedule A each affected parcel of land assessed has been identified by the municipal assessment roll number at the time of the preparation of this report. For convenience only, each parcel is also identified by the owner name(s) from the last revised assessment roll.

The amounts in Schedule A are derived from the cost distribution shown in Appendix A.

After construction is complete and final costs are known, the assessments for the final costs are to be prorata to the assessments for estimated costs as shown on Schedule A.

15.4 Appendix C – Estimated Net Assessments/Assessments of Final/Actual Project Costs

After the construction of the drain is certified complete by the Engineer the municipality will determine the total of incurred costs which will be the final/actual cost of the drain. Final/actual assessments will be determined by prorating/assessing the actual cost of the drain using Schedule A. Appendix C is shows how the assessments in Schedule A will be prorated. Appendix C is a separate attachment and is included for information purposes only. This appendix illustrates the estimated net assessments after deducting allowances and provincial grants, if any, from the total assessments shown in Schedule A. Appendix C will then be of assistance when preparing the final/actual cost bylaw and grant form. Actual assessments as calculated pursuant to Appendix C will be levied to the owner of the identified parcel at the time the Actual Cost Bylaw is passed. Roll numbers are as per the Municipality's last revised assessment roll. Names are included for convenience.

16.0 MAINTENANCE*

16.1 General

Section 74 of the Act requires the Drain, as outlined in this report, to be maintained by the Municipality.

The drain for future maintenance purposes shall consist of all components listed in the cost estimate.

Each component of the River Road Drain shall be maintained using the specifications, plans and profiles as contained in this Report.

16.2 Proportioning Maintenance Costs to Affected Lands and Roads

The cost of maintenance to be assessed to the upstream lands and roads pro rata with the assessments in Schedule B – Schedule of Assessments for Future Maintenance.

In order to establish the Schedule of Assessment for Future Maintenance (Schedule B) which could be both accurate and flexible for the determination of reasonable assessment distributions to the affected lands and roads both within the overall watershed or for select intervals, the River Road Drain is broken down into 4 intervals (one for each component). Schedule B indicates the amount of maintenance costs that each property and road is responsible for in each interval. The percentages shown in Schedule B determine the share of future maintenance to be levied on a property or road. For example, a $1,000 ditch repair will result in a $50 assessment to a property with a 5% maintenance assessment.

* *The words "maintenance" and "maintenance work" are to be deemed to also include repair or repair work, and minor improvements or minor improvement work, all as set out in the Drainage Act.*

If only a portion of any component is maintained, only the dollars and/or percentages for, and upstream of, the area of work shall be used in the appropriate component.

If all components of the drain are maintained at the same time, the percentages in the "total" column is to be used for prorating maintenance costs.

Percentages and/or amounts (values) shown for maintenance are not payable at this time; they are provided to determine the share of future maintenance cost. It will be necessary to determine grant eligibility at the time of maintenance cost levy.

The amounts found in Schedule B for assessing future repair and maintenance costs are derived from the detailed table included as Appendix B. Approximately 10% of the report cost estimates were used to determine the value/cost of each interval. These amounts were then distributed against the lands and roads within each particular component. A determined proportion of the estimated costs are applied as benefit assessments applicable to the affected lands and roads in each of the components. Benefit assessments are based on historical amounts and/or on judged amounts against all lands and roads directly abutting the drain or that benefit from improved drainage including maintenance.

After deducting the benefit assessments from one assumed component cost in Appendix B, the balance of the cost is then assessed as outlet liability on a per hectare basis to all upstream lands and roads.

The amounts in Appendix B were then transferred to Schedule B.

16.3 Specific Maintenance Provisions to this and other Holland Marsh Drains

Wherever, and whenever possible, maintenance occurs on any component of this drain that is along a road (River Road or Hillsview Road), the maintenance is to be done from the roadway.

Maintenance, when done from a roadway, should be done in a dry time of the year to reduce road damages and at a time of year when impact on adjacent agriculture will be minimized.

A right-of-way on the landowner side of each component of the drain exists for the Municipality to maintain the drain should there be a need to use such. The Municipality is only to work on the landowner side when the road cannot be used and when crops are not affected. Advance notice is to be provided and is to be given as early as possible. Damages to fields are to be minimized when used. The existence of a right-of-way was discussed in the Allowances section of this report. The right-of-way shall remain free of obstructions whenever maintenance is necessary from it. The work of/cost for removing obstructions in the right-of-way is the responsibility of the owner.

Any open (ditch) portion of a drain should be reviewed for maintenance (clean out) at a minimum of a 3 year frequency as is being recommended for all open drains within the Holland Marsh Drainage System.

Excavated materials from any maintenance activity are to be hauled to a suitable off-site disposal area unless an owner requests that any excavated peats/organics be left piled on his/her side of the ditch for his/her spreading/reuse. Any areas (road or field) damaged by maintenance are to be restored to conditions existing at the time or to the conditions required by this report, whichever requires the greater extent of restoration.

Pursuant to Section 74 of the Drainage Act, the Town of Bradford West Gwillimbury is always to provide road access to each component of the drain and a working width on the road along the drain for the Drainage Superintendent to undertake any necessary maintenance on any of the components and as described herein.

Any work of cleaning through, work to maintain the structural integrity of, or work to extend or replace any road crossing culvert forming part of the drain and the resulting costs will be the sole responsibility of the road authority. Any material removed from a road culvert is to be disposed of off site (hauled away). In this Report, this provision only applies to the River Road crossing on the Hillsview Road East Branch within the River Road right-of-way.

Any party making a new connection into any of the River Road Drain shall request permission from the Drainage Superintendent to connect to such drain. If the Drainage Superintendent is not notified, this connection may be deemed to be an obstruction under Sections 81 and 82 of the Drainage Act, RSO 1990 and shall be removed at the owner's expense.

The discharge of anything but clean, unpolluted water into a drain is forbidden by other provincial legislation. Materials such as petroleum products, liquid and granular fertilizers, herbicides, insecticides, fungicides, empty containers/boxes, spoiled produce, domestic and industrial garbage and waste, human or animal sewage, grey water sewage, scrap machinery can not be stored or placed adjacent to a ditch and can not be allowed to enter a drain. Any non-compliance will be reported to the appropriate authorities.

All parties affected by the River Road Drain are encouraged to periodically inspect the drain and report any visible or suspected problems to the HMDS Drainage Superintendent. Repeated inspection and maintenance of the drain should allow the drain to provide a service for many years.

16.4 Future Parcel and Land use Changes

To ensure maintenance assessments remain equitable, the maintenance assessments provided in this report should be reapportioned under Section 65 of the Drainage Act if and when future severances or amalgamations occur, or if and when new lands are connected to the Drain or if and when a land-use change occurs that can be accommodated by the existing Drain.

If a future land-use change will cause the drain capacity to be exceeded, a report under Section 4 or 78 may be required to provide increased capacity or to otherwise address any increased runoff.

17.0 GRANT

In accordance with the provisions of Section 85 of the Drainage Act and OMAFRA's ADIP policies, a provincial grant not exceeding 1/3 (33-1/3%) may be available on the total of the assessments against privately owned parcels of land which are used for agricultural purposes and are eligible for the Farm Property Class Tax Rate (F.P.C.T.R.). Section 88 of the Drainage Act directs the Town to make application for this possible grant upon certification of completion of the drain provided for in this report. The Town will then apply the grant prorata to the eligible assessments prior to collecting the final assessments.

If an assessed owner not shown as having the Farm Property Class Tax Rate feels that his or her property should be eligible for this grant calculation, and if the owner can provide proof to the Municipality of this eligibility as noted prior to the final cost levy then the property could have the one-third (33-1/3%) grant applied in the final cost levy against the property. Please be advised that OMAFRA retains the final right to determine eligibility under the grant program, regardless of designation herein.

In accordance with Section 85 of the Drainage Act, a grant not exceeding one third (33-1/3%) may also be available in the future on the assessments against privately owned parcels of land used for agriculture (again as per OMAFRA's ADIP policies), for maintenance and repair, if done on the recommendation and supervision of the Drainage Superintendent and using the same eligibility requirements as outlined above.

18.0 ALIGNMENT OF DRAINS IN RELATION TO PROPERTY LINES

All drains shall be constructed/maintained generally to the alignment as noted on the drawings. In the absence of fences or other properly marked and located legal boundaries, the drains shall be located more or less on the lands as noted in the plans and specific notes without the benefit of a legal survey to confirm property lines.

Construction and maintenance shall follow the location of the existing municipal drain specified on the plan, wherever practicable.

Should landowners desire a more precise location for the drains in relation to their property line or if there is a dispute about the location of any property line, it is recommended that landowners establish their legal property boundaries in advance of construction or maintenance and/or advise the Drainage Superintendent and/or Engineer prior to construction or maintenance, of the concern re the property line location.

19.0 BYLAW

This report including schedules, appendices, drawings and specifications, when adopted by bylaw in accordance with the Drainage Act, RSO 1990, will provide the basis for construction and maintenance of this project.

20.0 CHANGES TO DRAIN AFTER BYLAW IS PASSED AND BEFORE COST IS LEVIED

Should changes to the drain proposed in this report be required after the bylaw is passed and the contract is awarded, there may be some difficulty in attending to such. Since this drain is to be constructed in accordance with a Bylaw of the Town of Bradford West Gwillimbury, changes to the drain cannot be undertaken without a change to the bylaw. An exception would be very minor changes which are approved by the Engineer and the Municipality in accordance with the General Conditions in the report. Such changes must occur before final costs are levied.

If it is desired to make a substantial addition or deletion to the drain proposed in this report, it will be necessary that a revised report be prepared and processed through the Drainage Act, or in some cases, an application to the Ontario Drainage Tribunal may be made under the Drainage Act to obtain approval for a necessary change. The application to the Tribunal must occur before final costs are levied.

If any individual or group of owners require additional work on the proposed drain and are prepared to pay for such, they may make their own arrangements with the contractor to have such work constructed. The Engineer must pre-approve such additions to verify there is no impact on the function or maintenance of the drain as proposed. Even so, the work added would not form part of the drain for the purpose of future maintenance, or be eligible for grant.

All of which is respectfully submitted,

K. SMART ASSOCIATES LTD.

K. A. Smart, P. Eng.

mw

SCHEDULE A - SCHEDULE OF ASSESSMENTS FOR CONSTRUCTION
RIVER ROAD DRAIN
Town of Bradford West Gwillimbury

	Con	Lot	Roll No.	Owner	Affected Area (ha)	Benefit ($)	Outlet ($)	Total ($)
				Lands				
	2	Pt 5	006-01950	X. Chen	0.70	-	223	223
	2	Pt 5	006-02000	X. Zhang	1.80	-	573	573
	2	Pt 5	006-02100	2610392 Ontario Inc.	0.50	-	159	159
	2	Pt 5	006-02300	G. Verkaik	0.37	-	115	115
F	2	Pt 5	006-02400	G. Verkaik	8.40	-	2,676	2,676
	2	Pt 5	006-02601	G. Lote	0.18	-	57	57
F	2	Pt 5	006-02700	J. Devald	11.90	-	3,790	3,790
	2	Pt 5	006-02800	R. Joos	0.73	-	236	236
F	2	Pt 5	006-02900	Hillside Gardens Limited	3.40	27,200	2,166	29,366
	2	Pt 5	006-03100	J. Van Meggelen	0.20	-	64	64
	2	Pt 5	006-03200	N. Petherick	0.22	4,450	140	4,590
F	2	Pt 5	006-03300	Hillside Gardens Limited	3.30	26,400	2,102	28,502
F	1	Pt 5	006-03301	Hillside Gardens Limited	3.36	26,900	2,140	29,040
F	1	Pt 5	006-03302	Hillside Gardens Limited	6.54	52,300	4,166	56,466
F	1	Pt 5	006-03303	Jay-Dee Gardens Ltd.	9.81	78,400	6,249	84,649
	1	Pt 5	006-03304	K. Beckett	0.18	2,310	115	2,425
F	1	Pt 5	006-03305	Carron Farms Limited	16.70	133,600	10,639	144,239
F	2	Pt 6	006-04400	Hillside Gardens Limited	0.00	-	-	-
F	2	Pt 6	006-05500	Korag Farms Limited	0.00	-	-	-
				Sub-total (Lands):	68.29	351,560	35,610	387,170
				Roads				
		Hillsview Road		Town of Bradford West Gwillimbury	0.50	74,000	478	74,478
		River Road		Town of Bradford West Gwillimbury	1.50	296,350	1,912	298,262
				Sub-total (Roads):	2.00	370,350	2,390	372,740
				TOTAL ASSESSMENT RIVER ROAD DRAIN:	70.29	721,910	38,000	759,910

Notes:

1. The above lands marked "F" are currently classified as agricultural according to the OMAFRA and are therefore entitled to a 1/3 grant . Eligibility for the 1/3 grant will be confirmed at the time the final cost is levied.
2. Section 21 of the Drainage Act, RSO 1990 requires that assessments be shown opposite each parcel of land and road affected. The affected parcels of land have been identified using the roll number from the last revised assessment roll for the Township. For convenience only, the owners' names as shown by the last revised assessment roll, has also been included.

SCHEDULE B - SCHEDULE OF ASSESSMENTS
FOR FUTURE MAINTENANCE
RIVER ROAD DRAIN
Town of Bradford West Gwillimbury

Con	Lot	Roll No.	Owner	Hillsview Road East Br. $	Hillsview Road East Br. %	River Road South Br. $	River Road South Br. %	River Road North Br. $	River Road North Br. %	Hillsview Road West Br. $	Hillsview Road West Br. %	TOTAL $	TOTAL %
			Lands										
2	Pt 5	006-01950	X. Chen	22	0.07	0	0	0	0	0	0	22	0.03
2	Pt 5	006-02000	X. Zhang	57	0.18	0	0	0	0	0	0	57	0.08
2	Pt 5	006-02100	2610392 Ontario Inc.	16	0.05	0	0	0	0	0	0	16	0.02
2	Pt 5	006-02300	G. Verkaik	12	0.04	0	0	0	0	0	0	12	0.02
2	Pt 5	006-02400	G. Verkaik	268	0.83	0	0	0	0	0	0	268	0.35
2	Pt 5	006-02601	G. Lote	6	0.02	0	0	0	0	0	0	6	0.01
2	Pt 5	006-02700	J. Devald	379	1.18	0	0	0	0	0	0	379	0.5
2	Pt 5	006-02800	R. Joos	24	0.07	0	0	0	0	0	0	24	0.03
2	Pt 5	006-02900	Hillside Gardens Limited	1,325	4.12	0	0	5,308	23.48	17	3.78	6,650	8.79
2	Pt 5	006-03100	J. Van Meggelen	6	0.02	0	0	0	0	0	0	6	0.01
2	Pt 5	006-03200	N. Petherick	195	0.61	0	0	840	3.72	3	0.67	1,038	1.37
2	Pt 5	006-03300	Hillside Gardens Limited	1,286	4	0	0	5,152	22.8	17	3.78	6,455	8.54
1	Pt 5	006-03301	Hillside Gardens Limited	1,310	4.08	937	4.58	0	0	17	3.78	2,264	2.99
1	Pt 5	006-03302	Hillside Gardens Limited	2,548	7.93	1,821	8.91	0	0	33	7.33	4,402	5.82
1	Pt 5	006-03303	Jay-Dee Gardens Ltd.	3,820	11.89	2,730	13.36	0	0	50	11.11	6,600	8.73
1	Pt 5	006-03304	K. Beckett	106	0.33	80	0.39	0	0	1	0.22	187	0.25
1	Pt 5	006-03305	Carron Farms Limited	6,508	20.26	4,652	22.76	0	0	87	19.33	11,247	14.88
2	Pt 6	006-04400	Hillside Gardens Limited	0	0	0	0	0	0	0	0	0	0
2	Pt 6	006-05500	Korag Farms Limited	0	0	0	0	0	0	0	0	0	0
			Sub-total (Lands):	17,888	55.68	10,220	50.00	11,300	50.00	225	50.00	39,633	52.42
			Roads										
	Hillsview Road		Town of Bradford West Gwillimbury	14,047	43.73	10,220	50	11,300	50	225	50	35,792	47.33
	River Road		Town of Bradford West Gwillimbury	190	0.59	0	0	0	0	0	0	190	0.25
			Sub-total (Roads):	14,237	44.32	10,220	50.00	11,300	50.00	225	50.00	35,982	47.58
			TOTAL ASSESSMENT RIVER ROAD DRAIN:	32,125	100.00	20,440	100.00	22,600	100.00	450	100.00	75,615	100.00

Notes:

1. Section 21 of the Drainage Act, RSO 1990 requires that assessments be shown opposite each parcel of land and road affected. The affected parcels of land have been identified using the roll number from the last revised assessment roll for the Township. For convenience only, the owners' names as shown by the last revised assessment roll, has also been included.
2. All lands shown above are in the Town of Bradford West Gwillimbury
3. See Drawing 1 for location of stations.
4. The dollar amounts shown are not amoutts to be paid at this time. These amounts were used to create the percentages or portion that each parcel (property) and road will pay for any future maintenance repair or maintenance costs.
5. If all components are maintained at the same time, use the "Total" column.

APPENDIX A - CALCULATION OF ASSESSMENTS FOR CONSTRUCTION
RIVER ROAD DRAIN
Town of Bradford West Gwillimbury

									Total	
		COST ESTIMATE								
		Allowances							150,500	
		Construction							434,410	
		Engineering							137,000	
		Administration							28,000	
		Net HST							10,000	
		TOTAL COST ESTIMATE							759,910	
Conc.	**Lot**	**Roll No.**	**Owner**	**Total Ha Affected**	**Total ha Adjusted**		**Benefit**	**Ha Adjusted**	**Outlet**	
			Lands							
2	Pt 5	006-01950	X. Chen	0.70	0.35			0.35	223	
2	Pt 5	006-02000	X. Zhang	1.80	0.90			0.90	573	
2	Pt 5	006-02100	2610392 Ontario Inc.	0.50	0.25			0.25	159	
2	Pt 5	006-02300	G. Verkaik	0.37	0.18			0.18	115	
2	Pt 5	006-02400	G. Verkaik	8.40	4.20			4.20	2,676	
2	Pt 5	006-02601	G. Lote	0.18	0.09			0.09	57	
2	Pt 5	006-02700	J. Devald	11.90	5.95			5.95	3,790	
2	Pt 5	006-02800	R. Joos	0.73	0.37			0.37	236	
2	Pt 5	006-02900	Hillside Gardens Limited	3.40	3.40	*3.4 ha @ 8000/ha*	27,200	3.40	2,166	
2	Pt 5	006-03100	J. Van Meggelen	0.20	0.10			0.10	64	
2	Pt 5	006-03200	N. Petherick	0.22	0.22	*127m @ $35/m*	4,450	0.22	140	
2	Pt 5	006-03300	Hillside Gardens Limited	3.30	3.30	*3.3 ha @ 8000/ha*	26,400	3.30	2,102	
1	Pt 5	006-03301	Hillside Gardens Limited	3.36	3.36	*3.36 ha @ 8000/ha*	26,900	3.36	2,140	
1	Pt 5	006-03302	Hillside Gardens Limited	6.54	6.54	*6.54 ha @ 8000/ha*	52,300	6.54	4,166	
1	Pt 5	006-03303	Jay-Dee Gardens Ltd.	9.81	9.81	*9.81 ha @ 8000/ha*	78,400	9.81	6,249	
1	Pt 5	006-03304	K. Beckett	0.18	0.18	*66m @ $35/m*	2,310	0.18	115	
1	Pt 5	006-03305	Carron Farms Limited	16.70	16.70	*16.7 ha @ 8000/ha*	133,600	16.70	10,639	
2	Pt 6	006-04400	Hillside Gardens Limited	0.00	0.00			0.00	-	
2	Pt 6	006-05500	Korag Farms Limited	0.00	0.00			0.00	-	
			Sub-total (Lands):	68.29	55.90		351,560	55.90	35,610	
			Roads							
	Hillsview Road		Town of Bradford West Gwillimbury	0.50	0.75	*640+100 =740m@100/m*	74,000	0.75	478	
	River Road		Town of Bradford West Gwillimbury	1.50	3.00	1127m @ 250/m + 14,600 for curb	296,350	3.00	1,912	
			Sub-total (Roads):	2.00	3.75		370,350	3.75	2,390	
			TOTAL ASSESSMENT RIVER ROAD DRAIN:	70.29	59.65		721,910	59.65	38,000	(5%±)

Ha's Adjusted as Follows:

- Gravel roads x 1.5 for increased runoff.
- Paved roads x 2.0 for increased runoff
- Bush and/or low areas and/or areas tiled elsewhere with no provision for change x 0.5 for decreased runoff

APPENDIX B - CALCULATION OF ASSESSMENTS FOR FUTURE MAINTENANCE
RIVER ROAD DRAIN
Town of Bradford West Gwillimbury

						Hillsview Road East Branch				River Road South Branch				River Road North Branch				Hillsview Road West Branch					Gross Total
VALUE OF COMPONENT						$ 32,125				$ 20,440				$ 22,600				$ 450					$ 75,615
Conc.	Lot	Roll No.	Owner	Total Ha Affected	Total ha Adjusted	Benefit	Ha Adjusted	Outlet	%	Benefit	Ha Adjusted	Outlet	%	Benefit	Ha Adjusted	Outlet	%	Benefit	Ha Adjusted	Outlet	%	Total Benefits	Total Outlets	Total
			Lands																				
2	Pt 5	006-01950	X. Chen	0.70	0.35		0.35	22	0.07		-	-	-		-	-	-		0.35	-	-	-	22	22
2	Pt 5	006-02000	X. Zhang	1.80	0.90		0.90	57	0.18		-	-	-		-	-	-		0.90	-	-	-	57	57
2	Pt 5	006-02100	2610392 Ontario Inc.	0.50	0.25		0.25	16	0.05		-	-	-		-	-	-		0.25	-	-	-	16	16
2	Pt 5	006-02300	G. Verkaik	0.37	0.18		0.18	12	0.04		-	-	-		-	-	-		0.18	-	-	-	12	12
2	Pt 5	006-02400	G. Verkaik	8.40	4.20		4.20	268	0.83		-	-	-		-	-	-		4.20	-	-	-	268	268
2	Pt 5	006-02601	G. Lote	0.18	0.09		0.09	6	0.02		-	-	-		-	-	-		0.09	-	-	-	6	6
2	Pt 5	006-02700	J. Devald	11.90	5.95		5.95	379	1.18		-	-	-		-	-	-		5.95	-	-	-	379	379
2	Pt 5	006-02800	R. Joos	0.73	0.37		0.37	24	0.07		-	-	-		-	-	-		0.37	-	-	-	24	24
2	Pt 5	006-02900	Hillside Gardens Limited	3.40	3.40	1,108	3.40	217	4.12		-	-	-	5,308	3.40	-	23.48	17	3.40	-	3.78	6,433	217	6650
2	Pt 5	006-03100	J. Van Meggelen	0.20	0.10	-	0.10	6	0.02		-	-	-		0.10	-	-	-	0.10	-	-	-	6	6
2	Pt 5	006-03200	N. Petherick	0.22	0.22	181	0.22	14	0.61		-	-	-	840	0.22	-	3.72	3	0.22	-	0.67	1,024	14	1038
2	Pt 5	006-03300	Hillside Gardens Limited	3.30	3.30	1,076	3.30	210	4.00		-	-	-	5,152	3.30	-	22.80	17	3.30	-	3.78	6,245	210	6455
1	Pt 5	006-03301	Hillside Gardens Limited	3.36	3.36	1,096	3.36	214	4.08	937	3.36	-	4.58		-	-	-	17	3.36	-	3.78	2,050	214	2264
1	Pt 5	006-03302	Hillside Gardens Limited	6.54	6.54	2,131	6.54	417	7.93	1,821	6.54	-	8.91		-	-	-	33	6.54	-	7.33	3,985	417	4402
1	Pt 5	006-03303	Jay-Dee Gardens Ltd.	9.81	9.81	3,195	9.81	625	11.89	2,730	9.81	-	13.36		-	-	-	50	9.81	-	11.11	5,975	625	6600
1	Pt 5	006-03304	K. Beckett	0.18	0.18	94	0.18	12	0.33	80	0.18	-	0.39		-	-	-	1	0.18	-	0.22	175	12	187
1	Pt 5	006-03305	Carron Farms Limited	16.70	16.70	5,444	16.70	1,064	20.26	4,652	16.70	-	22.76		-	-	-	87	16.70	-	19.33	10,183	1,064	11247
2	Pt 6	006-04400	Hillside Gardens Limited	0.00	0.00		-	-	-		-	-	-		-	-	-		-	-	-	-	-	0
2	Pt 6	006-05500	Korag Farms Limited	0.00	0.00		-	-	-		-	-	-		-	-	-		-	-	-	-	-	0
			Sub-total (Lands):	68.29	55.90	14,325	55.90	3,563	55.68	10,220	36.59	-	50.00	11,300	7.02	-	50.00	225	55.90	-	50.00	36,070	3,563	39,633
			Roads																				
	Hillsview Road		Town of Bradford West Gwillimbury	0.50	0.75	14,000	0.75	47	43.73	10,220	-	-	50.00	11,300	-	-	50.00	225	-	-	50.00	35,745	47	35792
	River Road		Town of Bradford West Gwillimbury	1.50	3.00		3.00	190	0.59		-	-	-		-	-	-		-	-	-	-	190	190
			Sub-total (Roads):	2.00	3.75	14,000	3.75	237	44.32	10,220	-	-	50.00	11,300	-	-	50.00	225	-	-	50.00	35,745	237	35,982
			TOTAL ASSESSMENT RIVER ROAD DRAIN:	70.29	59.65	28,325	59.65	3,800	100.00	20,440	36.59	-	100.00	22,600	7.02	-	100.00	450	55.90	-	100.00	71,815	3,800	75,615
			Total Outlets			3,800				-				-				-						
			Ha. Into Interval			59.65				36.59				7.02				55.90						
			Outlet Rate / Ha			63.70				-				-				-						

Ha's Adjusted as Follows:
- Gravel roads x 1.5 for increased runoff.
- Paved roads x 2.0 for increased runoff
- Bush and/or low areas and/or areas tiled elsewhere x 0.50 for decreased runoff

APPENDIX D

OPTIONS PRESENTED FOR MEETINGS ON NOVEMBER 1 AND DECEMBER 3, 2019

October 29, 2019 File No. 19-034

RIVER ROAD DRAINAGE

OPTION 1

- Construct an 80m length of ditch from Central River west to River Road along or near the line between Hillside and Vonk
- Note: a second entrance to the Vonk field would be provided since the 80m of ditch would cut off their access from the existing entrance.
- Then run an 115m± length of 750mm pipe drain to opposite Weber Road below the east shoulder of River Road. (Use elbows/wyes in all closed drains where necessary. Typical all options so culverts/pipes inlet or outlet square to the flow.)
- The 750mm pipe on the east side of River Road would start at elevation 216.4 which is the Central River elevation.
- From opposite Weber, run a 540m± length of 600mm pipe drain to near the south limits of Ellen's lot in the SE quadrant of Hillsview and River below the east shoulder of River Road.
- Cross River Road with the pipe drain and terminate it on the west side.
- The fall in the 750mm to 600mm drain from Hillsview to Weber Road would be 250mm (10").
- Install four 250mm crossings of River Road by drilling or open cut and carry the crossings to the northwest corner of the 4 residential lots on the west side of River Road in this stretch, with 250mm tubing and install hickenbottoms at the ends.
- From head of 600mm drain on the west side of River Road at Hillsview, run a new channel (widen and deepen existing where it exists) north to the south end of Petherick lot (770m length). This ditch would have 300mm (12") of fall and would be 600 to 900mm below field levels
- Across the Petherick lot, construct a new 250mm tubing drain (75m long) with three CB's and small grading to these CB's. There would be 600mm± fall in this 250mm tubing.
- In addition to the 600mm to 750mm drain on the east side of River Road south of Hillsview, there would be a shallow swale with 1.5m to 2m top width and 300mm depth to carry overflow water from the north (water that could not be carried by the 600mm pipe). A separate 600mm culvert would have to parallel the 600mm pipe crossing near Hillsview and a 600mm culvert should go below the lanes serving the Hillside Farms north of the Vonk property.
- A large manhole would be necessary where the 600mm drain crosses the 250/300mm irrigation line that crosses River Road.
- In this manhole the 250/300mm irrigation line could be sleeved with steel pipe and its top would be 200mm± higher than the 600mm drain. However waters from the 600mm drain would pass under and over the irrigation line. The top and side of the manhole could be

insulated to minimize chances of freezing. The manhole would have to be poured in place or specially constructed. The steel sleeve, if needed, would be split pipe welded or coupled together.

- Three other manholes would be necessary on the 600 to 750mm drain.
- A sub-option (Option 1A) would be provided to carry the 750mm pipe and shallow swale further south to the north side of Vonk's buildings (115m) with just a 40m ditch from there to the river.

Cost Estimate

a)	Construction	
	- 80m ditch (5m top, 1m bottom, 1m deep) (Vonk/Hillside Line)	$ 10,000
	- 115m of 750mm pipe drain (east side) incl. 2 wyes	39,100
	- 540m of 600mm pipe drain (east side) incl. 2 wyes	140,400
	- 4 manholes	30,000
	- 770m of ditch (west side of road) (north of Hillsview)	57,750
	- 75m of 250mm tubing and 3 catchbasin on Petherick	12,000
	- 635m of shallow swale (east side) (south of Hillsview)	15,750
	- 20m of second 600mm pipe across River	10,000
	- 4 drill shots or open cut road crossings to outlet hickenbottoms	28,000
	- 150m of 250mm tubing and 4 hickenbottoms	8,000
	- 5,000m² of topsoil and seeding	20,000
	- 5% allowance for miscellaneous (riprap, connections, croc work, new entrance, paving, adjusting Vonk waterline)	20,000
	- 10% contingency allowance	40,000
	TOTAL CONSTRUCTION ESTIMATE:	**$ 431,000**
b)	Engineering & Administration	
	- Report	$ 50,000
	- Construction services (assuming 3 months total incl. tendering and finalization)	100,000
	- Municipal costs	
	- Net HST (580,000 x 0.0176)	10,000
	- Financing (580,000 x 2%)	10,000
	- Miscellaneous Allowance	20,000
	- Approvals Allowance	10,000
	TOTAL ENGINEERING & ADMINISTRATION	**$ 200,000**
c)	Allowances	
	- East Side	
	- Land Total - (2m x 750) / 10,000 x 100,000	$ 15,000
	- ROW – Damages every 3rd year (750 x 3 x 2000) / 10,000 = 500	
	∴ if invest $4000, receive $160 each year @ 4%	4,000
	- Construction Damages - 10 x 750 x (30,000 / 10,000)	21,000 *
	Sub Total	$ 40,000

- West Side		
- Land Total – 3 x 800 x 10	24,000	
- ROW – 800 / 750 x 4,000	Use 4,500	
- Damages – 800 / 750 x 21,000	23,000	*
Sub Total	$ 50,000	
TOTAL ALLOWANCES:	**$ 90,000**	
TOTAL PROJECT COST:	**$721,000**	

* *I have assumed initial ditch/swale construction would be done from the field side.*

Sub Option 1A

- To continue more southerly	
- 135m @ 360	$ 48,600
- 40m less ditch @ 120 (new ditch shorter)	-4,800
	44,000
- Plus 5% Misc. + 10% contingencies	6,800
	$ 50,800
USE	$ 50,000
Plus $5,000 more allowances + 5,000 more engineering & administration	10,000
TOTAL	**$ 60,000**

DISTRIBUTION FOR $721,000 (to be discussed) **

- However:
  - If roads are 50% = $360,000 (maybe roads should be more?)
  - If Hillside is 40% = 290,000 gross, $105,000 net (maybe this should be more?)
  - If others are 10% = 71,000 gross, Net ? (May be too high?)

** *I have not spent a lot of time on how I would recommend the costs should be distributed.*

NOTE: If there were no irrigation line to avoid along River Road, the project could be:

a) Construction		
- 80m ditch (5m top, 1m bottom, 1m deep) (Vonk/Hillside Line)	$ 10,000	
- Double the ditch cost in Option 1 – 57,750 x 2 to provide for continuous ditch (Petherick to Vonk)	115,000	
- 75m of 250mm tubing and 3 catchbasins on Petherick	12,000	
- 4 drill shots or open cut road crossings	28,000	
- 150m of 250mm tubing and 4 hickenbottoms	8,000	
- 5,000m² of topsoil and seeding	20,000	

-	5% allowance for miscellaneous (riprap, connections, croc work, new entrance, paving)	10,000
-	10% contingency allowance	20,000
	TOTAL CONSTRUCTION ESTIMATE:	**USE $ 225,000**

b) Engineering & Administration

-	As in Options 2 and 3 but $10,000 less	160,000
	TOTAL ENGINEERING & ADMINISTRATION	**$ 160,000**

c) Allowances

	TOTAL ALLOWANCES:	**$ 100,000**
	TOTAL PROJECT COST:	**$485,000**

APPENDIX D

OPTION 2

- Construct the same 80m length of ditch from the Central River west to River Road along or near the property line between Hillside and Vonk as in Option 1
- Then run 750mm pipe drain or culvert from here to opposite north limits of Weber Road in east shoulder of River Road as in Option 1.
- Then cross River Road as 750mm pipe close to the existing private 400mm crossing and continue to new ditch line.
- Construct an 1800mm MH and join 400mm and 750mm (with wyes) and let irrigation go through it.
- Then run a new channel from here north on the west side of River Road to Hillsview road allowance
- At the four residential lots traversed, long 750mm culverts would be placed generally below the west shoulder with wyes.
- There would be the same 250mm of fall in this ditch and culvert system from Weber Road to Hillsview Road.
- Then do all work north of Hillsview Road as in Option 1 with the same fall as in Option 1.
- If it was decided to go only with 300mm of fall (vs. 550mm) from south side of Petherick lot to Weber, we could cross over the irrigation line but with minimal clearance.
- Option 2 may have to relocate the 50mm water line that is on the west side of River Road if it is closer than 13 to 14m to the center of River Road. (It was found at two locations (300m and 400m± north of Weber Road) and at these two locations it was more than 18m from the centre of the road. I did not do any costing for watermain work but if we pursue Option 2, it should be located on Beckett's and on the next two lots to the north.)
- Three sub options could be provided for this Option 2.
- Option 2A would carry the 750mm pipe south to near the north edge of Vonk's buildings with the short 40m of ditch from there to the River as in Option 1A.
- Option 2B would run a ditch rather than a 750mm pipe from the River Road crossing to where the ditch comes up from the River between Hillside and Vonk.
- Option 2C would use a ditch on the east side of River Road from the crossing at Weber Road south to where it turns to go as a ditch to the river to the north of Vonk's buildings.

Cost Estimate

a) Construction

-	80m ditch (5m top, 1m bottom, 1m deep)	$ 10,000
-	115m of 750mm pipe drain (east side and across River) incl. 4 wyes	39,100
-	320m of ditch on west side (south of Hillsview)	24,000
-	220m of 750mm pipe at 4 lots and 16 wyes	77,000
-	1 – 1800mm manhole	10,000
-	770m of ditch (west side of road) north of Hillsview	57,750
-	150m of 250mm tubing and hickenbottoms	8,000
-	5,000m² of topsoil and seeding	20,000

-	75m of tubing and catchbasins at Petherick	12,000
-	5% allowance for miscellaneous	12,500
-	10% contingency allowance	27,000
	TOTAL CONSTRUCTION ESTIMATE:	**$ 297,350**

b) Engineering & Administration

-	Report	$ 50,000
-	Construction services	80,000
-	Municipal costs	40,000
	TOTAL ENGINEERING & ADMINISTRATION	**$ 170,000**

c) Allowances

-	East Side		
	-	Land Total	$ 4,500
	-	ROW	1,000
	-	Damages	4,500
		Sub Total	$ 10,000
-	West Side		
	-	Land Total	33,000
	-	ROW	6,000
	-	Damages	31,000
		Sub Total	$ 70,000
-	At the lots		$ 10,000
	TOTAL ALLOWANCES:		**$ 90,000**
	TOTAL PROJECT COST:		**$557,350**

Sub Option 2A

- Increase from Option 2 costs to carry 750mm pipe to north side of Vonk buildings
- As per Option 1A, add $ 60,000

Sub Option 2B

- To use ditch and lane culverts vs. 750mm pipe where drain is on the east side of River Road in Option 2.
  - Delete 85m of 750mm pipe at $340 -$ 28,900
  - Add 30m of 750mm culvert and 55m of ditch +10,200
  - Add allowances +5,000
  - Add Vonk waterline shift +2,000
  - Sub Total - Save -11,700
  - With contingencies, save -13,000
- Note: This could apply to Option 1 also.

APPENDIX D

Sub Option 2C

-	Go to north side of Vonk building with ditch from River Road crossing at Weber	
-	Save 85m of 750mm pipe	-28,900
-	Add 100m net more ditch along Vonk	+7,500
-	Add 30m of 750mm culvert and 55m of ditch on Hillside	+10,200
-	Add Vonk waterline shift	+4,000
-	New allowances to Vonk and Hillside	+15,000
	Net additional cost above the $557,350 would be (32,700 – 28,900)	+7,800

APPENDIX D

OPTION 3

- This option would make use of the existing ditch at the back of Hillside Farms and others that goes south to the River.
- In this option a new channel would be constructed from this rear ditch east to River Road within the unopened Hillsview Road allowance. The new section of ditch would have 200mm of fall from the rear ditch to River Road. Its bottom at River Road would be at or just below the same elevation as the new ditch in Option 1 (216.70±) but there would be 350mm of water in it because of backup from rear ditch (to elevation 217.05). There is actually 600mm of water in the rear ditch where the new ditch would start. (Perhaps if this ditch were fully surveying, incorporated and improved, this water level could be lowered somewhat. However, costs would increase. New lane crossings of this existing ditch may be necessary.)
- In Options 1 and 2, there should be no/minimal backup in any of the new ditches or pipes since Option 1 starts at elevation of Central River (216.40±).
- At the intersection of River Road and Hillsview the work to the north would be constructed as in Option 1 but as said there could be 350mm of standing water in the new ditch.
- At the intersection of Hillsview and River Road, the work to the south would involve ditch and culvert work as in Option 2 but the ditch would be 0 to 500mm shallower since it would drain north rather than south, and the culverts in front of the residential properties could be reduced to 600mm (although 750mm may be better for cleaning, etc.). This ditch and culvert system on the west side of River Road south of Hillsview would be only 200mm (average) below the low areas behind Beckett and the other residential properties and thus only a swale could be constructed to the rear of each of these lots versus a tubing and hickenbottom. The back up from the rear ditch would have water in this new ditch and pipe system close to the elevation of the low ground behind Beckett and others, and thus the spring drainage from these low grounds to the rear of Beckett would be impacted.

Cost Estimate

a) Construction

- 643m of new ditch from rear ditch to River Road along Hillsview Road allowance	$ 50,000
- 320m of ditch west side south of Hillsview	20,000
- 220m of 600mm pipe at houses	60,000
(If 750mm pipe vs. 600mm pipe, add:	*17,000)*
- 150m of swale to rear of 4 lots	5,000
- 770m of ditch to north on west side as in Options 1 & 2	58,000
- 75m of 250mm tubing and catchbasins at Petherick	12,000
- Topsoil and seeding	15,000
- 5% allowances for miscellaneous	11,000
- 10% contingency allowance	23,000
TOTAL CONSTRUCTION ESTIMATE:	**$ 254,000**

APPENDIX D

b)	Engineering and Administration	
	- Report	$ 50,000
	- Construction services	80,000
	- Municipal costs	40,000
	TOTAL ENGINEERING & ADMINISTRATION	**$ 170,000**
c)	Allowances	
	- West side South	10,000
	- West side North	50,000
	- At the lots	10,000
	- Along Hillsview	10,000
	TOTAL ALLOWANCES:	**$ 80,000**
	TOTAL PROJECT COST:	**$504,000**

APPENDIX D

OPTION 4

- This option would involve the outlet starting at the Central River at the intersection with Hillsview and then continuing as a culvert and ditch system west to River Road.
- Then the drain going south on River Road would be the shallow channel and 600mm culverts as in Option 3 and the drain going north would be as in all other options.
- There would be no back water since the outlet would be at the River level.
- The first 180m of drain from the River west along Hillsview would be 750mm pipe down the centre of the road (unless it could be found that the existing open channel on the south lot at the end of Hillsview could be used to reduce the length of pipe work). Then there would be open channel on the south side of Hillsview in front of the west part of Hillside Farm Parcel 006-04100, then a culvert across Hillsview, then an open channel on the north side of Hillsview in front of Hillside Farm Parcel 006-04400, then a culvert in front of the residential lot in the northeast quadrant and continuing across River Road. From there, the ditches and culverts, etc. going north and south on the west side of River Road would be as in Option 3.

Cost Estimate

a)	Construction	
	- 180m of 750mm pipe on Hillsview west of the River	$ 63,000 *
	- 70m of channel in front of 006-04100	5,600
	- 20m of 750mm pipe road crossing	9,500
	- 350m of channel in front of 006-04400	28,000
	- 85m of 750mm pipe in front of lot and across River Road	37,000 *
	- 320m of channel south on west side of River Road	20,000
	- 220m of 600mm pipe by lots	60,000
	- 150m of swale	5,000
	- 770m of ditch to north on west side of River Road	58,000
	- Work on Petherick's	12,000
	- Topsoil and seeding	20,000
	- 5% allowances for miscellaneous	15,000
	- 10% contingency allowance	33,000
	TOTAL CONSTRUCTION ESTIMATE:	**$ 366,100**
b)	Engineering and Administration	
	- Report	$ 50,000
	- Construction services	80,000
	- Municipal Costs	50,000
	TOTAL ENGINEERING & ADMINISTRATION	**$ 180,000**

* *If it were found/thought that more ditch could be done along the south lot on Hillsview just west of the River, and if Korag Farms 006-05500 would allow the ditch on their south limits, and if more ditch rather than pipe could be done on the rented lot in the northeast corner of Hillsview and River Road, maybe construction could be reduced by $50,000 ± to $60,000.*

c) Allowances

- To Parcels 006-04100 and 006-04400 on Hillsview	
- Land 4 @ 420 x 10	17,000
- ROW	6,000
- Damages 420 x 10 x 3	12,500
Sub Total	36,000
- Farms and lots on River Road as previous	70,000
TOTAL ALLOWANCES:	**$ 106,000**
TOTAL PROJECT COST:	**$652,100**

APPENDIX D

December 2019 File No. 19-034

RIVER ROAD DRAINAGE

OPTION 4 (REVISED)

A) On Wong Kong Pure Richard (South Side) to Korag (would be 96m±)

- See the drone aerial
- We would put 6m of 900mm, 12m of 900mm and 58m of 900mm (with 2 wyes)
- We would retain short lengths of ditch on Wong Kong with improvements
- All work should be within or on the edge of the 20m (66') road allowance
- However, we would pay allowances as set out below.

Cost Estimate

a)	Allowances to Wong Kong	
	- ROW and Damages	$ 2,000
	- Existing Drain	1,000
	TOTAL ALLOWANCES:	**$ 3,000**
b)	Construction	
	- Culverts:	
	- 6m of 900mm	2,700
	- 12m of 900mm	5,400
	- 58m of 900mm	27,000
	(would include 20m of ditch at ends)	
	- Asphalt on one drive	3,000
	- Topsoil and hydroseed	900
	- Gravel road – 30m of restoration	9,000
	- 5% allowance for miscellaneous	2,400
	- 10% contingency allowance	5,000
	TOTAL CONSTRUCTION ESTIMATE:	**$ 55,400**
c)	Engineering & Administration	
	- 50%±	
	TOTAL ENGINEERING & ADMINISTRATION	**$ 26,000**
	TOTAL PORTION COST:	**$ 84,400**
	USE:	**$ 85,000**

APPENDIX D

Notes:

1. If we had to go down road instead of on Wong Kong, cost would be:

-	*Pipe – 103m x 450*	*46,350*
-	*Gravel – 70 x 300*	*21,000*
-	*Riprap*	*650*
	Sub Total	*68,000*
-	*Plus 5% unknown + 10% contingency*	*10,500*
	Sub Total	*78,500*
-	*Plus 50% for engineering and administration*	*39,000*
	TOTAL	*$ 117,500*
		vs. 85,000

2. If 750mm pipe used, rate would be $100/m± less.

b) On Korag (150m Length, but 7.5m± is part of the 58m crossing)

- The ditch would be such that:
  a) Its top of north bank is 11m from centreline of road
  b) Could lose 4m of working land but only 1m of his own land
  c) Its bottom is 1.0m and 2:1 side slopes
  d) Top of bank to top of bank average is 4m
  e) All non organics hauled away (he would be given organics)
- 3 – 10m lengths of 750mm provided for field entrances (plus a 20m long culvert at east end)

Cost Estimate

a)	Allowances to Korag	
	- ROW and Damages	$ 5,500
	- Land (3 x 150 x 10)	4,500
	TOTAL ALLOWANCES:	**$ 10,000** *
b)	Construction	
	- Ditch 150 – 50 = 100 x 75	7,500
	- Culverts:	
	- 50m at $350± (or 4 @ $5,000)	20,000
	- 5% allowance for miscellaneous	1,400
	- 10% contingency allowance	2,900
	TOTAL CONSTRUCTION ESTIMATE:	**$ 31,800**
c)	Engineering & Administration	
	- 50%±	
	TOTAL ENGINEERING & ADMINISTRATION	**$ 15,900**
	TOTAL PORTION COST:	**$ 57,700**
	USE:	**$ 60,000**

* Maybe should be higher to also recognize his lost income

c) On Hillside

- New channel would be such that:
  a) It is 0.3 to 0.9m deeper than existing
  b) Where the berm exists, new north top of bank would be 2m further north
  c) New north top of bank would either be at or just inside the road allowance limit and would lose minimal field area.
- We would however give allowances for 5m of damage and 2m of lost land
- Field length is 350m±
- As well, there is a 50m long residential lot
- We would have to talk re how much of this lot length would have to be culvert and how much is ditch (for now assume 30m is culvert)
- One field entrance provided

Cost Estimate

a)	Allowances to Hillside		
	- Land 360 x 2 x 10	$ 7,200	
	- ROW and Damages	7,600	
	TOTAL ALLOWANCES:	**$ 14,800**	
	USE	**$ 15,000**	*
b)	Construction		
	- 350 @ $80	28,000	
	- 1 entrance	5,000	
	- 75m of 750mm at lot and across road	32,000	
	- 5% allowance for miscellaneous	3,000	
	- 10% contingency allowance	7,000	
	TOTAL CONSTRUCTION ESTIMATE:	**$ 74,000**	
c)	Engineering & Administration		
	- 50%		
	TOTAL ENGINEERING & ADMINISTRATION	**$ 37,000**	
	TOTAL PORTION COST:	**$ 126,000**	

* *Realistically may lose greater income and allowances should be higher.*

APPENDIX D

REVISIT POSSIBLE WORK ALONG RIVER ROAD SOUTH ON, OR ALONG, HILLSIDE AND OTHER PROPERTIES SOUTH OF HILLSVIEW

- What I think we should do is use a 600mm pipe and start at the south side of Lot 1206 (Sta. 365) and run north. We should leave a stub to south in case Hillside ever wants to reroute the 400mm drain north. Such rerouting would be flat or have a slight fall. Also call for hickenbottoms back to rear of Lots 1206, 1242, 1254, 1274 and outlet the 600mm pipe on the north side of the entrance that is in the unopened Hillsview Road West right-of-way.
- The north hickenbottom would only be 450mm deep but some additional depth would be available at others. Grades of leads would be flat.
- We could ask if Hillside wants us to go further south.
- The only work on private lands should be to install the offset hickenbottoms.
- If the work on the west side of River Road south of Hillsview is revised as above, the revised cost estimate for this section could be:

Cost Estimate

a)	Allowances	
	- For hickenbottom leads: ROW and Damages	$ 7,000
	TOTAL ALLOWANCES:	**$ 7,000**
b)	Construction	
	- 440m of 600mm pipe below west shoulder of River Road	$ 114,400
	- Five (5) 900 x 1200mm ditch inlet catchbasins	15,000
	- Four 200mm dia. tubing leads with hickenbottoms to the northwest corner of 4 lots (180m of tubing and 4 hickenbottoms)	10,000
	- 5% allowance for miscellaneous	7,000
	- 10% contingency allowance	14,600
	TOTAL CONSTRUCTION ESTIMATE:	**$ 161,000** *
c)	Engineering & Administration	
	TOTAL ENGINEERING & ADMINISTRATION	**$ 80,000**
	TOTAL PORTION COST:	**$248,000**

* *This was $85,000 previously.*

APPENDIX D

REVISIT WORK NORTH OF HILLSVIEW ON WEST SIDE OF RIVER ROAD

- The work would be as initially described with the exception that:
  a) Where parallel parking occurs on the west side of River Road this parking would be removed and the channel would be similar to that north and south
  b) To allow for field access, culverts would be provided.
- For now we will assume an average of 3m of new land beyond road allowance will be taken but it is more likely just 1 to 2m and the 3m is really from "toe of embankments'
- We will assume initial crop damages are over 10m but not likely to happen*.
- Petherick work for now to be similar to that previously costed.

Cost Estimate

a)	Allowances	
	- Hillside	
	- Land, ROW and damages	44,000
	- Petherick	
	- Land, ROW and damages	2,500
	TOTAL ALLOWANCES:	**$ 46,500**
b)	Construction	
	- Petherick work as before	12,000
	- 2 field entrances	10,000
	- 710m of ditch @ 75	53,250
	Sub Total	$ 75,250**
	- 5% allowance for miscellaneous	3,750
	- 10% contingency allowance	7,900
	TOTAL CONSTRUCTION ESTIMATE:	**$ 86,900**
c)	Engineering & Administration	
	TOTAL ENGINEERING & ADMINISTRATION	**$ 43,500**
	TOTAL PORTION COST:	**$ 176,900**

* *a) Kenn to confirm this*
b) Also have to see how many entrances needed
c) Verify work where they park parallel to road
d) Look at photos/street view re entrances to field

** *This is $78,675 in Alternative 5*

APPENDIX D

SUM OF OPTION 4 REVISED (WITH SOME ADJUSTMENTS)

Construction (including 5% and 10%)

-	On Hillsview	55,400	
		31,800	
		74,000	
-	On River South	161,000	
-	On River North	90,900	(4000 more as per Alt 5)
	Sub Total	413,100	

Allowances

-	Hillsview	5,000	(Increased)
		15,000	(Increated)
		15,000	
-	River South	7,000	
-	River North	46,500	
	Sub Total	88,500	

Engineering and Administration	100,000	*
Plus Seeding	21,500	(see Alt 5)
TOTAL OPTION COST	**$ 623,100**	** (should be $703,100)

Possible Variations in Construction Associated with Hillsview Component

a) Variation if on road by Wong Kong (using 900mm)

-	Construction	$78,500	vs. 55,400
-	Increase	23,100	
-	No allowances	- 5,000	
		NET 18,100	more

b) Variation if 98m (instead of 48m) of pipe on Korag (using 900mm)

-	Using 98m of pie instead of 48m, plus ditch	44,800	
-	Previous	- 31,800	
		NET 13,000	more

c) Variation if 20m pipe vs ditch on Hillside NET 5,500 more

* *This is wrong. I put engineering and administration at $100,000 and it should have been $180,000 as done back on November 1 (my mistake was related to not carrying the $80,000 of engineering and administration on Hillsview)*

** *With the missed $80,000, would be $703,100*

APPENDIX D

d)	Variation if we use 150m of pipe on Korag	
	- Change is 52 x (350 – 75) x 1.05 x 1.1	16,500
	- Eliminate allowances	-10,000
		NET 6,500
e)	Total possible increase for a), b) and d):	6,500
		5,500
		18,100
	TOTAL	30,100
f)	If 750mm vs. 900mm pipe is used	
	- Save $100/m x 266m* =	26,600
	- So $30,100 becomes	3,500

Note:

*	*Wong Kong area*	*96*
	Korag area	*150*
	Hillside area	*20*
		266

APPENDIX D

NEW OPTION 5

- This option is like original Option 1 where we use west side of River north of Hillsview and east side of River south of Hillsview
- But we use ditch throughout and relocate irrigation to west side of road with leads and culverts back but to east side
- East of River Road we also change irrigation line from pumphouse so it comes up to road just north of two property lines, shift the lane 3 to 4m to south, and then put ditch outlet on north side of lane and keep it north of pumphouse
- We would put in 420m± of 300mm and 210m± of 250mm of new irrigation line
- Approximate irrigation costs used would be:

		250mm	300mm	
-	Material/m	70	90	
-	Labour/m	100	140	
-	Plus add 5 drills @ 7,000			
-	Assume the 5% and 10% covers tees and flanges			
-	420m @ $230			96,900
-	210m @ $170			35,700
-	Drills			35,000
				167,600
-	5% and 10%			26,000
				Total 193,600
				Let's use 200,000
-	Damage allowances on west side 370 x 5 x 3			6,000

- My idea would be to either allow Hillside 200,000 and they do it or we do it as part of drain @ $300,000 (including engineering and administration) and Hillside pays 100,000 (50% less grant)

NEW OPTION 5 COST ESTIMATE

Construction

a) Work South of Hillsview
Construction (Starting North and Going South)

-	42m of ditch	3,150
-	20m of culvert (Hillsview)	8,000
-	20m of 600mm pipe road crossing	12,000
-	575m of ditch	43,125
-	45m of culvert	18,000
-	25m² of riprap	2,500
-	100m± of ditch	7,500
-	30m of Vonk water line	3,000
-	120m of 300mm irrigation to existing junction @ 230	27,600
-	300m of 300mm @ 230	69,000
-	210m of 250mm @ 170	48,300
-	9 offsets and risers @ 500	4,500

-	5 new irrigation road crossings @ 7,000	35,000
-	5 new lanes with culverts for irrigation leads on east side	25,000
-	255m of hickenbottom leads	10,200
	Sub Total	316,875
	X 1.05 =	332,720 ±
	X 1.10 =	**366,000 ±**

b)	Work North of Hillsview	
-	709m of ditch	53,175
-	15m of 600mm culvert	4,500
-	3 – 6m of 600mm at poles	5,400
-	1 – 12m field	3,600
-	Work at Petherick (as before)	12,000
	Sub Total	78,675
	X 1.05 =	82,600
	X 1.10 =	**90,900**

c)	Seeding and topsoil	**21,500**
	TOTAL CONSTRUCTION	**478,400 ±**

Allowances

-	River South		
	a)	East Side	
		Land taken	
		i) 90 x 6 x 10	5,400
		ii) 575 x 3 x 10	17,250
		ROW and Damages	23,350
	b)	West Side for Hickenbottoms	
		ROW and damages	5,150
		Sub Total	51,150
		Use	51,200
-	River North Side (see previous estimate)		
		Hillside	44,000
		Petherick	2,500
		TOTAL ALLOWANCES	**97,700**

Engineering and Administration	**200,000 ****
TOTAL OPTION COST:	**$ 776,100**

** *This assumes we do not oversee irrigation work*

APPENDIX E

SPECIFICATIONS FOR

RIVER ROAD DRAIN

TOWN OF BRADFORD WEST GWILLIMBURY

SEPTEMBER 18, 2020

The Specifications are to consist of:

A) Extent of Work

B) Supplemental Conditions (SC's)

C) General Special Provisions (GSP's)

D) Item Special Provisions (ISP's)

Contents

SPECIFICATIONS FOR

RIVER ROAD DRAIN

A) EXTENT OF WORK

- The work is to be carried out in accordance with the drawings and these specifications. The finished grades are to be determined from the Bench Marks, the positions of which are indicated on the watershed plan and profiles.

Stations	Description
i) Hillsview Road East Branch	
Hillsview Road (Town of Bradford West Gwillimbury)	
0+005	- At the outlet of this project, the bank of the Central River is to be excavated and the new 750mm pipe will commence. - The bank is to be recessed to allow for the placement of riprap at the new outlet. - The new outlet will be close to the fall/winter water levels and will be 200mm± below the high summer levels. - The pipe is to have a rodent gate at its end and is to be laid just to the north of a retaining wall that exists along the west bank of the river currently.
0+005 to 0+070	- 65m of 750mm dia. pipe - The first portion of the new drain is to be laid below the travelled portion of Hillsview Road and is to angle across the road at a light skew. - The new pipe will intersect a 100mm plastic private drain and such drain is either to be relaid above the new pipe or is be carried to a new outlet on the north side of the new pipe. - Full granular backfill will be necessary for the new pipe below the road. - The top portion of granular will be Granular A. - Typical for all portions of the pipe: All bedding and backfill for the pipe will be crushed limestone. - Typical for all portions of the project: Excavation for any pipe or culvert is to extend to the bottom of the peat which is expected to be very close to the 150mm bedding depth below the pipe in most cases. - This culvert will be recessed approximately 50mm below the channel bottom. - All pipe on this project is to be smooth wall high density pipe.

0+070	- A 1500mm diameter concrete manhole is to be constructed. This manhole will be just off of the road allowance and to the southwest of a tree that exists close and just northwest of a signpost. - The pipe will have a small bend at this location.
0+070 to 0+095	- The 750mm dia. pipe will continue west within the boulevard of the road with similar bedding and pipe backfill and will be 25m in length. The upper portion of the backfill is to match existing conditions.
0+095 to 0+111	- This 16m of 750mm dia. is to be placed below a new field entrance into the Korag Farms property. - The end of the pipe at Stn. 0+111 will be approximately 0.5m south of the property line. - The field entrance is to be constructed such that it has similar bedding and pipe backfill with the balance of the backfill to be granular/crushed limestone with a Granular A surface to constitute a field entrance. - The end of the field entrance will be approximately 2 to 2.5m north of the property line. - This culvert will be recessed approximately 50mm below the channel bottom. - Typical for all ends of pipes, a small amount of riprap is to be placed at the end of the pipe to protect the bank slopes.
0+111 to 0+234	- 123m of new open channel is to be constructed. - The centerline will be 1.0m south of the property line. - The north bank will be approximately 1.5m north of the property line. - There will be a 1m maintenance strip north of the north bank. - The excavation is expected to be almost fully in peat. The owner will be offered any peat that is removed. Any material that the owner does not wish is to be loaded and hauled away. - The new channel is to have a 1.0m bottom and 2:1 side slopes - The channel and 1m maintenance strip are to be hydroseeded upon completion. - A low grow Dutch clover is to be used for the hydroseeding.
0+234 to 0+249	- A new 15m length of 750mm dia. pipe field entrance is to be constructed that is to jointly serve the Korag Farms and the Hillside Gardens property similar to the existing laneway.

- The construction of the lane is to be as described for the laneway at the easterly edge of the Korag property and thus will have a granular surface as described.
- Typical for all pipe areas, some recessing of the pipe below the channel bottom is to be done. This culvert will be recessed approximately 50mm below the channel bottom.

0+249 to 0+575

- The open channel work will continue as described in front of the Korag Farms property (Sta. 0+111 to 0+234) and will be 326m in length.
- There is an existing shallow channel and the new channel will generally be adjacent to but north of the existing channel.
- The new north top of bank of the channel will be approximately 1.0 to 1.5m north of the property line and a 1m maintenance strip will be north of that.
- This channel will be approximately 0.5 to 1.0m deep with respect to field levels, and will be hydroseeded as on the Korag property.
- This disposal of materials is to be similar as described for the Korag property also.
- In this interval a 25mm (1") plastic waterline exists to the north of the new channel. This waterline will be crossed at 2 locations. Where it is crossed, the work will be to either find sufficient slack in the line that it can be lowered to give approximately 500mm of cover below the channel, or the line will have to be cut and a new section spliced into it so as to be below the new channel.
- Insulation is to be placed above the pipe and below the channel regardless of whether it is a lowered existing pipe or a new pipe.
- If a section of new pipe is installed, pressure testing will be necessary to ensure no leaks exist and also disinfection will have to be undertaken to provide a minimum chlorine residual at the location of the supply.

0+575 to 0+590

- 750mm dia. pipe culvert work will recommence.
- The first section is to constitute a new 15m wide field entrance with similar construction to the previously described field entrances.

0+590 to 0+650±

- This 750mm pipe will continue but it will be placed below an existing grassed residential property and will be 60m in length.
- The bedding and backfill for the pipe will be similar but the surface restoration will consist of native non-organics and then either salvaged topsoil or new topsoil plus hydroseeding. This hydroseeding will be a residential lawn mix as opposed to a low grow Dutch clover.

- The new pipe will come close to tree roots in 2 locations. Special care will be necessary to cut the tree roots to minimize damage to the trees.
- There is an existing roadside swale in this interval. It exists to the south of the new pipe location. This swale is to be maintained and is to be carried across the new pipe near Stn. 0+590 so that it continues to discharge to the north.

River Road (Town of Bradford West Gwillimbury)

0+650 to 0+673

- This will be a further 23m length of 750mm pipe. It will be installed below a paved road.
- The bedding and backfill will be similar to the work below Hillsview Road to the east in that granular is to continue to road surface. The upper most granular will be Granular A. This section of road is then to be paved.
- The documents require two lifts of asphalt and the specifications are set up that the second lift may not be approved for installation until after one year of consolidation of the first lift.
- The base asphalt is to consist of 50mm of either SP 19 or HL8, and the upper is to consist of 50mm of either HL3 or SP 12.5.

0+673

- At this location, a further 1500mm diameter concrete manhole is to be constructed. This will allow for the joining of the River Road South Branch plus for the upper most length of the Hillsview Road East Branch.
- This manhole will be constructed generally along the roadside slope of River Road.

0+673 to 0+679

- This interval is to consist of 6m of 600mm diameter pipe.
- The end of this pipe will be into the open channel component of the River Road North Branch.
- Riprap is to be installed at the end of this pipe.

ii) River Road South Branch

River Road (Town of Bradford West Gwillimbury)

0+000 to 0+432

- General:
- The full River Road South Branch is to consist of 432m of 525mm dia. smooth wall high density polyethylene pipe and it is to be installed below the west shoulder of River Road, so that it is approximately midway between the edge of asphalt and the pole line that exists to the west of the travelled portion of the road.

- The pipe will be installed so that it is approximately 2m below the elevation of the road shoulder. Again this will put the pipe invert with its bedding very close to the base of the peat that exists. In any case, the bedding for the pipe is to extend to peat if it's deeper.
- All excavated materials are to be loaded and hauled away.
- All bedding and pipe backfill is to be crushed limestone.
- Granular is to continue to the road surface so that the total road shoulder will be a granular material. Where lawn areas abut the road, the shoulder width will be narrower.
- There are actually four locations where the pipe will pass below a developed lot on the west side of River Road and in these instances where a portion of the lot is grassed, the upper part of the backfill will be topsoil and hydroseed to match the existing conditions and where the existing conditions consist of granular, the uppermost surface of the backfill will be a Granular A material.
- Even where the pipe is within a portion of a grassed area, a minimum of 1 metre granular shoulder is to be constructed.
- There will be one laneway what will be crossed that is asphalt and similar asphalt work will be necessary at that location as required for a roadway.

0+074, 0+177,0+273 0+364 & 0+432

- At these locations, a 900 x 1200mm rectangular concrete catchbasin is to be constructed to serve as a manhole.
- Each catchbasin is to be constructed so that its top concrete is flush with ground level, and a 100 to 150mm high steel bar birdcage grate is to be constructed on the catchbasin.
- At each of the catchbasin locations (Sta. 0+074, 0+177, 0+273 & 0+364), a 200mm diameter hickenbottom branch drain is to be constructed west out of the catchbasin.
- The invert of the 200mm piping is to be at the invert elevation of the 525mm piping in each catchbasin so that the maximum cover is available at the top end of the 200mm piping. These branch drains are called the hickenbottom branch drains (HB 1 to HB 4).
- These hickenbottom branch drains are to consist of 200mm slotted plastic tubing wrapped with geotextile, and are to continue westerly to the northwest corner of the lots that they are to be constructed adjacent to and are to include a 200mm dia. hickenbottom at the end of each branch. Generally the tubing itself will be constructed very close to the edge of the developed portion of the lot and the hickenbottom itself will be constructed as close as possible to the line between the developed portion of the lot and the field.
- Each of the hickenbottom branch drains is to be constructed with similar bedding and backfill as other drain but the surface backfill and restoration is to match existing field conditions and the existing peats are to be saved and replaced so that field restoration is equivalent to existing conditions.

- At each of the hickenbottom locations, a small pyramid of stone is to be placed to support the hickenbottoms. The hickenbottoms are generally to be in the magnitude of 500 to 600mm above grade and are to be wrapped with a filter fabric prior to the installation of the stone cone around it.
- This River Road South Branch will cross three 300mm diameter corrugated steel pipe culverts that are used to sleeve irrigation pipes that pass below the road.
- These pipe culverts are either to be supported when the new drain passes below or are to be removed and reset after trench construction.
- At the top end of this project, a stub is to be placed south out of the last catchbasin manhole so that the landowner may join a pumped tile system that exists further to the south.
- There will be in the magnitude of 150mm to 200mm of fall available to make the connection to the south.
- There is an underground Bell line to the west of the new drain and it will be away from any trench construction but will be crossed by the hickenbottom branches.

iii) River Road North Branch

River Road (Town of Bradford West Gwillimbury) / Hillside Farms Ltd.

0+000 to 0+695

- This 695m length will be an open channel with four culverts in it. It will follow along the west edge of the road allowance.
- The first 200m± will have the centre of the ditch 0.5m on the road side of the property line.
- The middle 200m will have the ditch centerline 0.5m on the outside of the property line.
- The top 200m will have the centre of the ditch on the property line.
- The ditch will be a 1m wide bottom with 2:1 side slopes.
- Its bottom will be approximately 0.4 to 0.8m below field level.
- There is an existing ditch in portions of this length and the new channel will be 0.2 to 0.4m lower than the existing channel.
- The west top of bank will be 1 to 2m into the property owned by Hillside Farms and then there will be a 1m maintenance strip on the west side of the channel.
- Excavation except at the very top end should be fully in peat. At the top end, peat thickness is less and channel excavation will be into the underlying silt soils.
- As in other open channels any peat that the owner wishes is to be made available to them and the balance of material is to be hauled away.

- Three of the four crossings will be at hydro brace pole locations and the fourth will be at an irrigation croc system owned by Hillside Farms. Each crossing will be 600mm dia. pipe.
- The culverts at the brace poles will be approximately 6m in length and will have grading above to mirror a laneway construction but such that the guy wire to the brace can be set in the pipe backfill.
- The hydro poles will require support during construction and work will be necessary to ensure that the guy posts are installed into rigid material.
- The culvert at the crocs owned by Hillside Farms will be 12m in length and will intercept a 250mm pipe that is to be cut and sealed where it is crossed.
- Just north of this culvert installation, there are abandoned concrete light standard poles and stone areas that are used for bank stability as areas of riprap. The poles are to be removed and disposed of and the riprap is to be reused if possible or is otherwise to be disposed of.
- All work is to be done so as to minimize damage to River Road. Any track equipment that operates on the asphalt is to be operated if possible on wood mats or gravel fill.

0+695 to 0+704

- At the end of this 695m of ditch work there is an existing 450mm lane culvert below a field entrance into Hillside Gardens and this culvert is to be removed and replaced with a new 9m length of 600mm pipe.

0+695 to 0+727

- Carrying on from the top end of the ditch, onto or adjacent to the Petherick property, there is to be a 15m length of 300mm pipe that runs from the head of the ditch to a new 600 x 600mm concrete catchbasin location at Sta. 0+712 and then from this catchbasin location there is to be a 17m length of 300mm pipe running up to the Petherick driveway.
- Out of the new catchbasin to the west, there is to be a 9m± length of 150mm plastic tubing to an existing well. This well presently has an artesian overflow into the ditch running west on the Hillside property. This overflow is to be re-directed to the new 150mm tubing.
- As well, there is a 100mm tubing around the well casing and this tubing wrap is also to be joined up to the 150mm lead.

0+713 to 0+804

- From the catchbasin north to the intersection of River Road and Canal Road and then for a short length west on Canal Road, there is to be a new asphalt curb and gutter constructed along the west edge of pavement on River Road and the south edge of pavement of Canal Road. This curb and gutter is to be approximately 800mm in width and will have approximately 100mm gutter depth from the high wall.
- This curb and gutter is to outlet to a riprap apron at the catchbasin from Sta. 0+712 to 0+713 and consists of 6m² of riprap.

- The excavation for the curb and gutter is to be used to create a small mound on the back side of the curb and gutter.
- Some brushing will be necessary at the intersection of Canal Road and River Road to allow the construction of the curb and gutter.

iv) Hillsview Road West Branch

Hillsview Road (Unopened) (Town of Bradford West Gwillimbury)

0+000 to 0+050

- This Branch will be a short length (50m±) of twin runs of 300mm diameter perforated tubing. It will commence where the River Road North Branch discharges into the 600mm pipe of the Hillsview Road East Branch.
- This tubing will be installed primarily on the road allowance which is worked by the landowners to the north and south and the first portion will parallel a field entrance off River Road.
- At the top end of the 50m length, which is in the low portion of this unopened road allowance, 250mm diameter hickenbottoms are to be constructed on each run similar to the hickenbottoms on the hickenbottom branches in the River Road South Branch.
- The final location and configuration of this short branch will have to be confirmed with the landowner at the time of construction due to the existence of the field entrance. It may be desirable to use a swale west of the entrance and keep the hickenbottoms at the edge of the entrance. If the drain is placed under the entrance, a change to 300mm dia. HDPE piping may be made for the east portion of the branch.

B) SUPPLEMENTAL CONDITIONS

SC 1.0 General Terms

1.01 Standard Conditions
The General Conditions of this contract are OPSS MUNI Form 100 – MTO General Conditions of Contract. Such apply except where amended or replaced by these Supplemental Conditions or by any of the General Special Provisions.

1.02 No Indemnities from the Owner
Notwithstanding anything else in the Contract, any express or implied reference to the Owner providing an indemnity or any other form of indebtedness or contingent liability that would directly or indirectly increase the indebtedness or contingent liabilities of the Owner beyond the obligation to pay the Contract Price in respect of Deliverables accepted by the Owner, whether at the time of entering into the Contract or at any time during the Contract, shall be void and of no legal effect.

1.03 Entire Contract
The Contract embodies the entire agreement between the parties with regard to the provision of the Deliverables and supersedes any prior understanding or agreement, collateral, oral or otherwise with respect to the provision of the Deliverables, existing between the parties at the commencement of the Contract.

1.04 Severability
If any term or condition of the Contract, or the application thereof to the parties or to any Persons or circumstances, is to any extent invalid or unenforceable, the remainder of the Contract, and the application of such term or condition to the parties, Persons or circumstances other than those to which it is held invalid or unenforceable, shall not be affected thereby.

1.05 Failure to Enforce Not a Waiver
Any failure by the Owner to insist in one or more instances upon strict performance by the Contractor of any of the terms or conditions of the Contract shall not be construed as a waiver by the Owner of its right to require strict performance of any such terms or conditions, and the obligations of the Contractor with respect to such performance shall continue in full force and effect.

1.06 Changes by Written Amendment Only
Any changes to the Contract shall be by written amendment signed by the parties. No changes shall be effective or shall be carried out in the absence of such an amendment. Any such written changes shall be included in the definition of Contract.

1.07 Force Majeure
Neither party shall be liable for damages caused by delay or failure to perform its obligations under the Contract where such delay or failure is caused by an event beyond its reasonable control. The parties agree that an event shall not be considered beyond one's reasonable control if a reasonable business person applying due diligence in the same or similar circumstances under the same or

similar obligations as those contained in the Contract would have put in place contingency plans to either materially mitigate or negate the effects of such event. Without limiting the generality of the foregoing, the parties agree that force majeure events shall include natural disasters and acts of war, insurrection and terrorism but shall not include shortages or delays relating to supplies or services. If a party seeks to excuse itself from its obligations under this Contract due to a force majeure event, that party shall immediately notify the other party of the delay or non-performance, the reason for such delay or non-performance and the anticipated period of delay or non-performance. If the anticipated or actual delay or non-performance exceeds fifteen (15) Business Days, the other party may immediately terminate the Contract by giving notice of termination and such termination shall be in addition to the other rights and remedies of the terminating party under the Contract, at law or in equity.

1.08 Notices by Prescribed Means

Notices shall be in writing and shall be delivered by postage-prepaid envelope, personal delivery or email and shall be addressed to, respectively, the Contract Administrator and the Contractor Representative. Notices shall be deemed to have been given: (a) in the case of postage-prepaid envelope, five (5) Business Days after such notice is mailed; or (b) in the case of personal delivery or email one (1) Business Day after such notice is received by the other party. In the event of a postal disruption, notices must be given by personal delivery or by email. Unless the parties expressly agree in writing to additional methods of notice, notices may only be provided by the methods contemplated in this paragraph.

1.09 Governing Law

The Contract shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein.

SC 2.0 Nature of Relationship

2.01 Contractor's Power to Contract

The Contractor represents and warrants that it has the full right and power to enter into the Contract and there is no agreement with any other Person which would in any way interfere with the rights of the Owner under this Contract.

2.02 Representatives May Bind the Parties

The parties represent that their respective representatives have the authority to legally bind them to the extent permissible by the Requirements of Law.

2.03 Not a Partner, Agent or Employee

The Contractor shall have no power or authority to bind the Owner or to assume or create any obligation or responsibility, express or implied, on behalf of the Owner. The Contractor shall not hold itself out as an agent, partner or employee of the Owner. Nothing in the Contract shall have the effect of creating an employment, partnership or agency relationship between the Owner and the Contractor (or any of the Contractor's directors, officers, employees, agents, partners, affiliates, volunteers or subcontractors).

The Contractor acknowledges and agrees that the Owner is not hiring an employee(s) to perform the Deliverables under the Contract. As such, the Owner reserves the right to terminate the Contract if all appeals have been

exhausted and the Contractor is determined by any board, court or tribunal of competent jurisdiction to be an employee.

Any and all monies paid to the Contractor shall be returned regardless of the extent of work that has been completed to that point, and all material and documents associated with the Contract, as well as Owner property, shall be returned to the Owner. The Contractor acknowledges and agrees that any work completed to the date when the appeal process has been completed, and an unfavourable determination is made, will be provided to the Owner for free and without any expectation of compensation. The risk associated with completing any work while there is an appeal process underway is entirely born by the Contractor.

2.04 Responsibility of Contractor

The Contractor agrees that it is liable for the acts and omissions of its directors, officers, employees, agents, partners, affiliates, volunteers and subcontractors. This paragraph is in addition to any and all of the Contractor's liabilities under the Contract and under the general application of law. The Contractor shall advise these individuals and entities of their obligations under the Contract and shall ensure their compliance with the applicable terms of the Contract. In addition to any other liabilities of the Contractor pursuant to the Contract or otherwise at law or in equity, the Contractor shall be liable for all damages, costs, expenses, losses, claims or actions arising from any breach of the Contract resulting from the actions of the above mentioned individuals and entities This paragraph shall survive the termination or expiry of this Contract.

2.05 Subcontracting or Assignment

Unless provided for in the Contract, the Contractor shall not subcontract or assign the whole or any part of the Contract or any monies due under it without the prior written consent of the Owner. Such consent shall be in the sole discretion of the Owner and subject to the terms and conditions that may be imposed by the Owner.

Every Contract entered into by the Contractor with a subcontractor shall adopt all of the terms and conditions of this Contract as far as applicable to those parts of the Deliverables provided by the subcontractor.

The Contractor agrees that to the extent that specific subcontractors are named in the Contract as being responsible for the provision of the Deliverables, only those subcontractors shall provide the Deliverables under the Contract. The Contractor shall not replace or substitute any of the subcontractors named in the Contract without the prior written approval of the Owner, which may not arbitrarily or unreasonably be withheld. Should the Contractor require the substitution or replacement of any of the subcontractors named in the Contract, it is understood and agreed that any proposed replacement must possess similar or greater qualifications than the subcontractor named in the Contract. The Contractor shall not claim fees for any replacement subcontractor greater than the Contract Price established under the Contract.

Nothing contained in the Contract shall create a Contractual relationship between any subcontractor or its directors, officers, employees, agents, partners, affiliates or volunteers and the Owner.

2.06 Duty to Disclose Change of Control
In the event that the Contractor undergoes a change in control the Contractor shall immediately disclose such change in control to the Owner and shall comply with any terms and conditions subsequently prescribed by the Owner resulting from the disclosure.

2.07 Conflict of Interest
The Contractor shall: (a) avoid any Conflict of Interest in the performance of its Contractual obligations; (b) disclose to the Owner without delay any actual or potential Conflict of Interest that arises during the performance of its Contractual obligations; and (c) comply with any requirements prescribed by the Owner to resolve any Conflict of Interest. In addition to all other Contractual rights or rights available at law or in equity, the Owner may immediately terminate the Contract upon giving notice to the Contractor where: (a) the Contractor fails to disclose an actual or potential Conflict of Interest; (b) the Contractor fails to comply with any requirements prescribed by the Owner to resolve a Conflict of Interest; or (c) the Contractor's Conflict of Interest cannot be resolved to the satisfaction of the Owner. This paragraph shall survive any termination or expiry of the Contract.

2.08 Contract Binding
The Contract can be enforced by and is binding upon the parties and their successors, executors, administrators and their permitted assigns.

SC 3.0 Performance by Contractor

3.01 Commencement of Performance
The Contractor shall commence performance upon receipt of written instructions from the Owner.

3.02 Contractor's Warranty
The Contractor hereby represents and warrants that the Deliverables (i) shall be provided fully and diligently in a professional and competent manner by persons qualified and skilled in their occupations; and (ii) shall be free from defects in material, workmanship and design, suitable for the purposes intended, in compliance with all applicable specifications and free from liens or encumbrance on title; and furthermore that all Deliverables shall be provided in accordance with: (a) the Contract; (b) Industry Standards; and (c) Requirements of Law. If any of the Deliverables, in the opinion of the Owner, are inadequately provided or require corrections, the Contractor shall forthwith make the necessary corrections at its own expense as specified by the Owner in a rectification notice.

3.03 Guaranteed Maintenance and Warranty
Upon completion of the Deliverables, the Contractor shall maintain these Deliverables for a warranty period of twenty-four (24) months after the date of the substantial completion to the satisfaction of the Owner.

The Contractor shall correct any imperfections due to material or Workmanship following issuance of any Substantial Completion. The decision of the Owner as to the nature and cause of any imperfections and the necessity for the type of repair shall be final. If the Contractor fails to comply with the direction from the Owner within five (5) Calendar Days or immediately in the case of an emergency the Owner may proceed under the bonding provided or if it is

holding a Letter of Credit, Money Order, Certified Cheque, or Bank Draft/Cheque, it may draw upon it and complete the required Deliverables at the Contractor's expense.

The warranty given pursuant to this section shall not limit extended warranties on any items of equipment or material called for elsewhere in the Contract. The Contractor shall, to the extent permitted by the manufacturer and/or supplier, assign to the Owner the benefit of any warranty by any manufacturers and/or suppliers in addition to the warranty as mentioned above.

3.04 Occupational Health and Safety

The Contractor shall:

(a) be the designated "constructor", as defined in the *Occupational Health and Safety Act* ("OHSA"), for the work site and shall fulfill the responsibilities of the position under the OHSA, related statutes and regulations;

(b) comply with the OHSA and ensure that all persons assigned to perform the Deliverables under the Contract adhere to the OHSA and all applicable statutes and regulations; and

(c) give immediate notice by telephone or personal communication to the Owner as to any damage or injury, or threat of damage or injury, to persons or property during the performance of the services contemplated by this Contract.

The Contractor's failure to comply with any of the above requirements shall be cause for either immediate termination or suspension of the Contract until the deficiency, in the opinion of the Owner and/or Workplace Safety and Insurance Board ("WSIB") is rectified at no cost to the Owner.

The Contractor acknowledges and agrees that any damages or fines that may be assessed against the Owner by reason of a breach or breaches of the OHSA by the Contractor or any of its subcontractors shall entitle the Owner to set off the damages so assessed against any monies that the Owner may from time to time owe the Contractor under this Contract or any other Contract whatsoever.

3.05 Hazardous Materials

The Contractor shall provide a list of all controlled hazardous materials or products containing hazardous materials, all physical agents or devices or equipment producing or omitting physical agent and any substance, compound, product or physical agent that is deemed to be or contains a designated substance in accordance with the Workplace Hazardous Materials Information System 2015 (WHMIS 2015) as defined under the Occupational Health and Safety Act and shall provide appropriate Material Health and Safety Data Sheets for these substances used for the performance of the required Deliverables, all prior to the performance of said Deliverables.
The Contractor shall follow Workplace Hazardous Materials Information Systems 2015 (WHMIS 2015) requirements and ensure all employees are given required training and support.

The Contractor shall have a clearly defined safety plan/rescue plan for its workers involved in hazardous activities. This plan shall include, but not be limited to, procedures for entering a confined space on the work site.

The Contractor shall have a Health & Safety Policy including a written Lock-out procedure.

3.06 Designated Personnel

Prior to commencing the Deliverables, the Contractor shall identify to the Owner the designated work site supervisor, the designated health and safety representative, any subcontractors, and any additional personnel representing the Contractor, along with their respective roles and responsibilities in the performance of the Deliverables.

3.07 Protection of Deliverables and Property

The Contractor shall observe all of the Owner's procedures with regard to the security of the facility where the Deliverables is performed and shall adequately protect the Deliverables, property, and premises of the Owner. The Contractor shall be responsible for any damages due to any act or omission of the Contractor's employees, agents, Contractors, subcontractors and those others for whom the Contractor is responsible.

3.08 Risk of Loss or Damage

The Contractor shall bear all risk of loss or damage from any cause, which may occur to any part or portion of the Deliverables, until the Deliverables have been completely accepted by the Owner in writing. If any loss or damage occurs to the Deliverables before the Owner accepts the Deliverables in writing, the Contractor shall immediately repair or re-execute any damaged part of the Deliverables at the Contractor's expense.

3.09 Licenses and Permits

The Contractor shall obtain and hold throughout the term of the Contract any and all permits, approvals, and licenses required by any municipal, provincial, or federal government or authority having jurisdiction over the whole, or any part of, the Deliverables to be performed by the Contractor pursuant to the Contract. The Contractor shall provide the Owner with copies upon request.

3.10 Licensed Trades

The Contractor shall employ and shall ensure that all subcontractors are employ licensed trades in good standing with the Ontario College of Trades, where applicable and required.

3.11 Contractor's Obligations to Subcontractors

The Contractor shall comply with the *Construction Lien Act* and other applicable statute and regulation, and discharge its lawful obligations to its subcontractors. The Contractor shall satisfy any claims against the Contractor or the Owner by its subcontractors. The issuance of the final payment shall not be construed as a representation that the Owner has made any examination to ascertain:

(a) how and for what purpose the Contractor has used the monies paid to the Contractor in accordance with the terms of the Contract; or

(b) whether the Contractor has discharged the obligations imposed on the Contractor by the *Construction Lien Act*, the *Occupational Health and Safety Act,* or other applicable statute or regulation, noncompliance with which may render the Owner personally liable for the Contractor's default.

3.12 Co-operation of the Contractor

The Owner may perform, or retain or permit others to perform other work on or near the work site and may permit public utility companies and others to do work on or near the work site during the Contractor's performance of the Deliverables. The Contractor shall conduct and schedule the performance of the Deliverables and co-operate with those other parties so as to cause as little interference as possible with any such other work being carried out.

The Contractor shall allow access to the work site on demand to representatives of the Owner.

3.13 Specifications and Materials

The Contractor shall carefully study and compare all specifications, Drawings, and other instructions relating to the performance of the Deliverables and comply with the requirements of the Contract. The Contractor shall not substitute any supplies or materials where a specific brand or model has been specified in the Contract without first obtaining written approval from the Owner.

3.14 Condition of Site

The Contractor shall confine all work to the site. The Contractor shall keep the site free from accumulations of waste material or rubbish caused by the Contractor's activities during the performance of the Deliverables and shall remove all rubbish from the site and the vicinity upon the completion of the Deliverables.

3.15 Accessibility for Ontarians with Disabilities (AODA)

The Contractor shall comply with the provisions of the *Accessibility for Ontarians with Disabilities Act*, 2005 and all of its regulations, as amended. The Contractor shall ensure that its employees, agents, volunteers and representatives receive any applicable training as required on the AODA and its regulations

3.16 Shipment of Goods

To the extent that the Deliverables includes the shipment of goods to the Owner, all such goods shall be Delivered Duty Paid (DDP) (Incoterms 2010) to the Owner's place of business or such other location as may be specified in the Contract. No transportation or delivery charges of any kind, including, without limitation, packing, boxing, storage, cartage or customs brokerage charges, shall be paid by the Owner, unless specifically agreed by the Owner in writing. The goods will be suitably packed in such a manner as will ensure their safe transportation undamaged to their destination. The goods will remain at the risk of the Contractor until the goods are received by the Owner. Receipt of the goods at the Owner's location does not constitute acceptance of the goods by the Owner. The goods are subject to the Owner's inspection and acceptance within a reasonable period of time after delivery. If any of the goods, in the opinion of the Owner, are inadequately provided or require corrections, the

Contractor shall make the necessary corrections at its own expense as specified by the Owner in a rectification notice.

3.17 Use and Access Restrictions
The Contractor acknowledges that unless it obtains specific written preauthorization from the Owner, any access to or use of the Owner property, technology or information that is not necessary for the performance of its Contractual obligations with the Owner is strictly prohibited. The Contractor further acknowledges that the Owner may monitor the Contractor to ensure compliance with this paragraph. This paragraph is in addition to and shall not limit any other obligation or restriction placed upon the Contractor.

3.18 Notification by Contractor to the Owner
The Contractor shall advise the Owner promptly of: (a) any contradictions, discrepancies or errors found or noted in the Contract; (b) supplementary details, instructions or directions that do not correspond with those contained in the Contract; and (c) any omissions or other faults that become evident and should be corrected in order to perform the Deliverables in accordance with the Contract and Requirements of Law.

3.19 Performance Monitoring
The Contractor understands that its performance shall be monitored and that their overall performance shall be a major consideration for future Contracts with the Owner. The frequency and detail of ongoing performance monitoring shall be dependent upon the nature of the Deliverables.

3.20 Lost Production Days
The Owner shall review all claims of lost production prior to the Contractor ceasing Deliverables. Expenditures claimed under lost production shall be per OPS 127 and shall not include any overhead and profit. In the event of a dispute between the Owner and Contractor, the process shall follow the Owner's Alternative Dispute Resolution.

3.21 Time
Time is of the essence.

3.22 Rights and Obligations Not Limited
The express rights and remedies of the Owner and obligations of the Contractor set out in the Contract are in addition to and shall not limit any other rights and remedies available to the Owner or any other obligations of the Contractor at law or in equity.

SC 4.0 Payment and Audit

4.01 Payment According to Contract Price
The Owner shall, subject to the Contractor's compliance with the provisions of the Contract, pay the Contractor for the Deliverables provided at the Contract Price established under the Contract.

4.02 Estimated Quantities and Provisional Items
The Owner reserves the right to increase or decrease the estimated quantities set out in the RFT and will adjust the Contract amount accordingly based on the

unit price or lump sum price, whichever is applicable. The Owner will only pay the Contractor for the actual quantity used based on the unit price or lump sum price. The Contractor acknowledges that this may result in the payment being less than their Total Bid Price for the Contract and the Contractor shall not claim extra payment for loss of anticipated profits.

4.03 Owner's Payment Terms

Unless the parties expressly set out an alternative billing and payment process, the following process shall govern:

a) All payments shall be made in net 30 days.

b) All payments shall be made in Canadian funds.

c) The Contractor shall provide the Owner with a monthly billing statement no later than ten (10) Business Days after the end of each month and that billing statement shall include: (i) the reference number assigned to this Contractor by the Owner; (ii) a brief description of the work provided for the relevant month; and (iii) taxes, if payable by the Owner, identified as separate items.

d) Each billing statement is subject to the approval of the Owner before any payment is released and payment shall be made within thirty (30) Business Days of such approval.

e) Payment shall be by electronic fund transfer and the Contractor shall provide the Owner with the necessary banking information to enable electronic fund transfer payments.

f) Where the work is subject to the Construction Lien Act all payments under this Contract shall be subject to the holdback and other provisions of the Construction Lien Act.

g) The work is also subject to a 2% Maintenance Security Hold Back.

No payment by the Owner shall constitute an acceptance of any portion of the Deliverables which is not in accordance with the requirements of this Contract.

4.04 Construction Lien Act Hold Back

In accordance with the Construction Lien Act prior to release of the hold back the Contractor shall submit to the Owner the following documents:

a) Workplace Safety and Insurance Board Certificate of Clearance dated after the commencement of the 45-day Lien period;
b) a Standard Statutory Declaration; and
c) proof of publication of certification of substantial performance of Contract under Section 32 of the Construction Lien Act, R.S.O., 1990 C., 30, (as amended).

Upon receipt of the above documents, expiration of the 45-day lien period and confirmation that the Contract is free of liens or unsettled claims, the 10% lien hold back shall be released.

Notwithstanding the above, the Owner may retain a portion of the hold back as assurance for the rectification of any outstanding deficiencies.

4.05 Maintenance Security Hold Back Release

The 2% maintenance security shall be reduced at the end of the warranty period, provided that there are no outstanding maintenance and warranty issues.

4.06 Payment of Taxes and Duties

Unless otherwise stated, the Contractor shall pay all applicable taxes, including excise taxes incurred by or on the Contractor's behalf with respect to the Contract.

4.07 Withholding Tax

The Owner shall withhold any applicable withholding tax from amounts due and owing to the Contractor under the Contract and shall remit it to the appropriate government in accordance with applicable tax laws. This paragraph shall survive any termination or expiry of the Contract.

4.08 Interest on Late Payment

If a payment is in arrears through no fault of the Contractor, the interest charged by the Contractor, if any, for any late payment shall not exceed the Bank of Canada's prime rate, in effect on the date that the payment went into arrears.

4.09 Release of Bid Securities (if any)

Bid securities of all bidders will be released upon the execution of the Form of Agreement with the successful bidder.

4.10 Release of Contract Securities

a) Where the contract security is a certified cheque, Bank Draft/Cheque or irrevocable letter of credit, the security will be reduced to a value of $50,000 during the maintenance period. This will be in addition to the statutory 2% maintenance warranty holdback.

b) Contract securities in the form of bonds will be released at the end of the warranty period.

4.11 Document Retention and Audit

For seven (7) years after the completion or termination of the Contract, the Contractor shall maintain all necessary records to substantiate (a) all charges and payments under the Contract and (b) that the Deliverables was provided in accordance with the Contract and with Requirements of Law. During the Contract, and for seven (7) years after the expiration or termination of the Contract, the Contractor shall permit and assist the Owner in conducting audits of the operations of the Contractor to verify (a) and (b) above. The Owner shall provide the Contractor with at least ten (10) Business Days prior notice of its requirement for such audit. The Contractor's obligations under this paragraph shall survive any termination or expiry of the Contract.

SC 5.0 Confidentiality

5.01 Confidentiality and Promotion Restrictions
Any publicity or publications related to the Contract shall be at the sole discretion of the Owner. The Owner may, in its sole discretion, acknowledge the Deliverables provided by the Contractor in any such publicity or publication. The Contractor shall not make use of its association with the Owner without the prior written consent of the Owner. Without limiting the generality of this paragraph, the Contractor shall not, among other things, at any time directly or indirectly communicate with the media in relation to the Contract unless it has first obtained the express written authorization to do so by the Owner.

5.02 Owner Confidential Information
During and following the term of the Contract, the Contractor shall: (a) keep all Owner Confidential Information confidential and secure; (b) limit the disclosure of Owner Confidential Information to only those of its directors, officers, employees, agents, partners, affiliates, volunteers or subcontractors who have a need to know it for the purpose of providing the Deliverables and who have been specifically authorized to have such disclosure; (c) not directly or indirectly disclose, destroy, exploit or use any Owner Confidential Information (except for the purpose of providing the Deliverables, or except if required by order of a court or tribunal), without first obtaining: (i) the written consent of the Owner and (ii) in respect of any Owner Confidential Information about any third-party, the written consent of such third-party; (d) provide Owner Confidential Information to the Owner on demand; and (e) return all Owner Confidential Information to the Owner before the expiration or termination of the Contract, with no copy or portion kept by the Contractor.

5.03 Restrictions on Copying
The Contractor shall not copy any Owner Confidential Information, in whole or in part, unless copying is essential for the provision of the Deliverables. On each copy made by the Contractor, the Contractor must reproduce all notices which appear on the original.

5.04 Notice of Breach
The Contractor shall notify the Owner promptly upon the discovery of loss, unauthorized disclosure, unauthorized access or unauthorized use of Owner Confidential Information.

5.05 Injunctive and Other Relief
The Contractor acknowledges that breach of any provisions of this Article may cause irreparable harm to the Owner or to any third-party to whom the Owner owes a duty of confidence, and that the injury to the Owner or to any third-party may be difficult to calculate and inadequately compensable in damages. The Contractor agrees that the Owner is entitled to obtain injunctive relief (without proving any damage sustained by it or by any third-party) or any other remedy against any actual or potential breach of the provisions of this Article.

5.06 Notice and Protective Order
If the Contractor or any of its directors, officers, employees, agents, partners, affiliates, volunteers or subcontractors become legally compelled to disclose any Owner Confidential Information, the Contractor will provide the Owner with prompt notice to that effect in order to allow the Owner to seek one or more

protective orders or other appropriate remedies to prevent or limit such disclosure, and it shall co-operate with the Owner and its legal counsel to the fullest extent. If such protective orders or other remedies are not obtained, the Contractor will disclose only that portion of Owner Confidential Information which the Contractor is legally compelled to disclose, only to such person or persons to which the Contractor is legally compelled to disclose, and the Contractor shall provide notice to each such recipient (in co-operation with legal counsel for the Owner) that such Owner Confidential Information is confidential and subject to non-disclosure on terms and conditions equal to those contained in the Contract and, if possible, shall obtain each recipient's written agreement to receive and use such Owner Confidential Information subject to those terms and conditions.

5.07 MFIPPA Records and Compliance

The Contractor and the Owner acknowledge and agree that MFIPPA applies to and governs all Records and may require the disclosure of such Records to third parties. Furthermore, the Contractor agrees (a) to keep Records secure; (b) to provide Records to the Owner within seven (7) Calendar Days of being directed to do so by the Owner for any reason including an access request or privacy issue; (c) not to access any Personal Information unless the Owner determines, in its sole discretion, that access is permitted under MFIPPA and is necessary in order to provide the Deliverables; (d) not to directly or indirectly use, collect, disclose or destroy any Personal Information for any purposes that are not authorized by the Owner; (e) to ensure the security and integrity of Personal Information and keep it in a physically secure and separate location safe from loss, alteration, destruction or intermingling with other records and databases and to implement, use and maintain the most appropriate products, tools, measures and procedures to do so; (f) to restrict access to Personal Information to those of its directors, officers, employees, agents, partners, affiliates, volunteers or subcontractors who have a need to know it for the purpose of providing the Deliverables and who have been specifically authorized by an Owner representative to have such access for the purpose of providing the Deliverables; (g) to implement other specific security measures that in the reasonable opinion of the Owner would improve the adequacy and effectiveness of the Contractor's measures to ensure the security and integrity of Personal Information and Records generally; and (h) that any confidential information supplied to the Owner may be disclosed by the Owner where it is obligated to do so under MFIPPA, by an order of a court or tribunal or pursuant to a legal proceeding and the provisions of this paragraph shall prevail over any inconsistent provisions in the Contract.

5.08 Survival

The provisions of this section shall survive any termination or expiry of the Contract.

SC 6.0 Intellectual Property

6.01 Owner Intellectual Property
The Contractor agrees that all Intellectual Property and every other right, title and interest in and to all concepts, techniques, ideas, information and materials, however recorded, (including images and data) provided by the Owner to the Contractor shall remain the sole property of the Owner at all times.

6.02 No Use of the Owner Insignia
The Contractor shall not use any insignia or logo of the Owner except where required to provide the Deliverables, and only if it has received the prior written permission of the Owner to do so.

6.03 Ownership of Intellectual Property
The Owner shall be the sole Owner of any Newly Created Intellectual Property. The Contractor irrevocably assigns to and in favour of the Owner and the Owner accepts every right, title and interest in and to all Newly Created Intellectual Property in the Deliverables, immediately following the creation thereof, for all time and irrevocably waives in favour of the Owner all rights of integrity and other moral rights to all Newly Created Intellectual Property in the Deliverables, immediately following the creation thereof, for all time. To the extent that any of the Deliverables include, in whole or in part, the Contractor's Intellectual Property, the Contractor grants to the Owner a licence to use that Contractor Intellectual Property in the manner contemplated in this Article, the total consideration for which shall be payment of the Contract Price to the Contractor by the Owner.

6.04 Contractor's Grant of License
For those parts of the Deliverables that are Contractor Intellectual Property, the Contractor grants to the Owner a perpetual, world-wide, non-exclusive, irrevocable, transferable, royalty free, fully paid up right and license: (a) to use, modify, reproduce and distribute, in any form, those Deliverables; and (b) to authorize other Persons, including agents, Contractors or sub-Contractors, to do any of the former on behalf of the Owner.

6.05 No Restrictive Material in Deliverables
The Contractor shall not incorporate into any Deliverables anything that would restrict the right of the Owner to modify, further develop or otherwise use the Deliverables in any way that the Owner deems necessary, or that would prevent the Owner from entering into any Contract with any Contractor other than the Contractor for the modification, further development of or other use of the Deliverables.

6.06 Third-Party Intellectual Property
The Contractor represents and warrants that the provision of the Deliverables shall not infringe or induce the infringement of any Third-Party Intellectual Property rights. The Contractor further represents and warrants that it has obtained assurances with respect to any Contractor Intellectual Property and Third-Party Intellectual Property that any rights of integrity or any other moral rights associated therewith have been waived.

6.07 Survival
The obligations contained in this section shall survive the termination or expiry of the Contract.

SC 7.0 Indemnities and Insurance

7.01 Contractor Indemnity
The Contractor hereby agrees to indemnify and hold harmless the Indemnified Parties from and against any and all liability, loss, costs, damages and expenses (including legal, expert and Contractor fees), causes of action, actions, claims, demands, lawsuits or other proceedings, (collectively, "Claims"), by whomever made, sustained, incurred, brought or prosecuted, including for breaches of confidentiality or privacy or Intellectual Property rights or for third party bodily injury (including death), personal injury and property damage, in any way based upon, occasioned by or attributable to anything done or omitted to be done by the Contractor, its subcontractors or their respective directors, officers, agents, employees, partners, affiliates, volunteers or independent Contractors in the course of performance of the Contractor's obligations under, or otherwise in connection with, the Contract. The Contractor further agrees to indemnify and hold harmless the Indemnified Parties for any incidental, indirect, special or consequential damages, or any loss of use, revenue or profit, by any person, entity or organization, including, without limitation, the Owner, claimed or resulting from such Claims. The obligations contained in this paragraph shall survive the termination or expiry of the Contract.

7.02 Third Party Claims
When the Contractor is contacted about, presented with or forwarded a Notice of Claim received by the Owner from a third party who claims to have been injured or suffered property damage within the construction zone or resulting from the Contractor's maintenance of the construction zone or as a result of work performed under the Contract ("Claimant"), the Contractor and/or their insurance representative shall:

a) deal with the Claim in a prompt, courteous and efficient manner;
b) correspond with the Claimant, their legal representative and/or insurance company directly; and
c) forward an acknowledgement of receipt to the Claimant within ten (10) working days as well as forward a copy to the Contract Administrator and Insurance Claims Coordinator.

The Contractor and/or their insurer are requested to provide a final response to a Claim for property damage within four (4) weeks of receiving a notice of claim. In the event that the Claim is denied, the Contractor and /or their insurer are requested to copy the Owner's Contract Administrator and Insurance Claims Coordinator in the denial letter with full explanation of the denial.

If the Contractor and/or the Owner is named and served with a Statement of Claim, the Contractor and/or their insurer shall assume the defense of any such action, including the Owner's defense, and ensure that the Owner is kept apprised of the status of the legal proceedings in any such action by copying

the Owner's Contract Administrator and Insurance Claims Coordinator on all correspondence in this matter.

For any Claims, which the Contractor is ultimately deemed liable, the Contractor will reimburse the Owner for any costs incurred by the Owner in the investigation and handling of the Claim.

The Contractor must resolve and/or attend all Claims within thirty (30) Calendar Days from the date of notice to the satisfaction of the Owner's Director of Corporate Services. Prior to releasing a holdback reduction or final payment, the Director of Corporate Services will be contacted to ensure that all outstanding claims have been resolved and/or attended to.

7.03 Insurance

The Contractor hereby agrees to put in effect and maintain insurance for the duration of the Contract, at its own cost and expense, with insurers licensed to do business in the province of Ontario and having a secure A.M. Best rating of B + or greater, or the equivalent, all the necessary and appropriate insurance that a prudent person in the business of the Contractor would maintain including, but not limited to, the following:

a) Commercial General Liability Insurance on an occurrence basis for third party bodily injury, personal injury and property damage, to an inclusive limit of not less than **$5,000,000** per occurrence and including products and completed operations liability. The policy is to include the following:

- the Owner, Town of Bradford West Gwillimbury and K. Smart Associates Limited as additional named insureds with respect to liability arising in the course of performance of the Contractor's obligations under, or otherwise in connection with, the Contract
- blanket contractual liability coverage
- cross-liability and severability of interests clause
- premises and all operations liability coverage
- products and completed operations coverage
- employers liability coverage
- Owner's and Contractor's protective coverage
- 30 day written notice of cancellation, termination or material change
- tenants legal liability coverage (if applicable and with suitable sub-limits)
- non-owned automobile coverage with blanket contractual coverage for hired automobiles
- a maximum deductible of five thousand dollars ($5,000), the cost of which shall be the entire responsibility of the Contractor

b) Automobile Insurance for all licensed vehicles that have access to the site or vehicles which are employed in the execution of the Deliverables in accordance with the applicable provincial statutes as they relate to vehicles licensed for public highways with liability limits subject to limits of not less than **$2,000,000** per occurrence combined bodily injury and property damage.

c) Contractor's Pollution Liability Insurance subject to limits of not less than **$5,000,000** inclusive per claim.

The Owner reserves the right to request such higher limits of insurance or other types of policies appropriate to work as the Owner may reasonable require.

The Contractor shall use reasonable efforts to require that its subcontractors obtain appropriate coverage applicable to the portion of the Deliverables that they perform

7.04 Proof of Insurance

The Contractor shall provide the Owner with proof of the insurance required by this Contract in the form of valid certificates of insurance that reference this Contract and confirm the required coverage. The Contractor shall provide the Owner with renewal replacements on or before the expiry of any such insurance. Upon the request of the Owner, a copy of each insurance policy shall be made available to it.

7.05 Workplace Safety and Insurance

The Contractor warrants and agrees that it has complied and will comply with all applicable workplace safety and insurance laws and regulations and, if the Contractor is subject to the *Workplace Safety and Insurance Act*, will provide proof of valid coverage by means of a current Workplace Safety and Insurance Board ("WSIB") clearance certificate to the Owner upon request. The Contractor covenants and agrees to pay when due, and to ensure that each of its subcontractors pays when due, all amounts required to be paid by it and its subcontractors under the *Workplace Safety and Insurance Act* throughout the duration of the Contract. The Contractor further agrees to indemnify the Owner for any and all liability, loss, costs, damages and expenses (including legal fees) or other charges in connection with the Contractor's failure to comply with any applicable workplace safety and insurance laws or related to the Contractor's status with the WSIB.

Effective January 1, 2013**,** Bill 119 legislates that all Contractors and Sub-Contractors categorized under Class G: Construction, shall have a WSIB account and clearance coverage prior to commencing any Contract. Alternatively, if the Contractor is an Independent Operator and is not categorized under Class G: Construction, the Contractor shall submit a letter from the WSIB confirming that s/he has Independent Operator Status under the WSIB Act. If the Contractor does not have Independent Operator Status, the Contractor shall;

a) Complete an Independent Operator Status Questionnaire upon being awarded the Contract; and

b) fund all costs associated with any appeal of a determination by WSIB that the Contractor is not an Independent Operator; and

c) provide proof of Employer's Liability Insurance (provided either by WSIB or the Contractor's insurance provider with a limited of not less than $2,000,000**.**

7.06 Subcontractor's Insurance

The Contractor shall ensure that each of its subcontractors obtains all the necessary and appropriate insurance that a prudent person in the business of the subcontractor would maintain and that the Owner and Indemnified Parties are named as additional insured with respect to any liability arising in the course of performance of the subcontractor's obligations under the subcontract for the provision of the Deliverables. If the Contractor intends to engage any subcontractor whose insurance coverage is less than the requirements stated in paragraph 7.03, the Contractor shall first obtain the Owner's written consent to use such subcontractor for a portion of the Deliverables on the Contract.

The Contractor shall be responsible to ensure all subcontractors have a current WSIB clearance certificate and a valid insurance certificate prior to commencement of any work under this Contract. The Owner reserves the right to request copies of these certificates at any time.

SC 8.0 Termination

8.01 Immediate Termination of Contract

The Owner may immediately terminate the Contract upon giving notice to the Contractor where:

a) the Contractor is adjudged bankrupt, makes a general assignment for the benefit of its creditors or a receiver is appointed on account of the Contractor's insolvency;

b) the Contractor breaches any provision in paragraph 5.0 Confidentiality;

c) the Contractor breaches the Conflict of Interest paragraph in paragraph 2.0 Nature of Relationship;

d) the Contractor, prior to or after entering into the Contract, makes a material misrepresentation or omission or provides materially inaccurate information to the Owner;

e) the Contractor undergoes a change in control which adversely affects the Contractor's ability to satisfy some or all of its obligations under the Contract;

f) the Contractor subcontracts for the provision of part or all of the Deliverables or assigns the Contract without first obtaining the written approval of the Owner; or

g) the Contractor's acts or omissions constitute a substantial failure of performance and the above rights of termination are in addition to all other rights of termination available at law, or events of termination by operation of law.

8.02 Rectification Notice

Subject to the above paragraph, where the Contractor fails to comply with any of its obligations under the Contract, the Owner may issue a rectification notice to the Contractor setting out the manner and timeframe for rectification. Within seven (7) Business Days of receipt of that notice, the Contractor shall either: (a) comply with that rectification notice; or (b) provide a rectification plan satisfactory to the Owner. If the Contractor fails to either comply with that rectification notice or provide a satisfactory rectification plan, the Owner may immediately terminate the Contract. Where the Contractor has been given a prior rectification notice, the same subsequent type of non-compliance by the Contractor shall allow the Owner to immediately terminate the Contract.

8.03 Termination on Notice

The Owner reserves the right to terminate the Contract, without cause, upon thirty (30) Calendar Days prior notice to the Contractor.

8.04 Contractor's Obligations on Termination

On termination of the Contract, the Contractor shall, in addition to its other obligations under the Contract and at law (a) at the request of the Owner, provide the Owner with any completed or partially completed Deliverables; (b) provide the Owner with a report detailing: (i) the current state of the provision of Deliverables by the Contractor at the date of termination; and (ii) any other information requested by the Owner pertaining to the provision of the Deliverables and performance of the Contract; (c) execute such documentation as may be required by the Owner to give effect to the termination of the Contract; and (d) comply with any other instructions provided by the Owner, including but not limited to instructions for facilitating the transfer of its obligations to another Person. This paragraph shall survive any termination of the Contract.

8.05 Contractor's Payment Upon Termination

On termination of the Contract, the Owner shall only be responsible for the payment of the Deliverables provided under the Contract up to and including the effective date of any termination. Termination shall not relieve the Contractor of its warranties and other responsibilities relating to the Deliverables performed or money paid. In addition to its other rights of hold back or set off, the Owner may hold back payment or set off against any payments owed if the Contractor fails to comply with its obligations on termination.

8.06 Termination in Addition to Other Rights

The express rights of termination in the Contract are in addition to and shall in no way limit any rights or remedies of the Owner under the Contract, at law or in equity.

8.07 Suspension of Contractor's Performance

The Owner may in its sole discretion at any time upon written notice to the Contractor suspend the performance of the Deliverables, in whole or in part, for a specified or unspecified time. Upon receiving notice of the suspension, the Contractor shall immediately suspend all operations concerning that identified portion of the Deliverables except such Deliverables as is necessary in the opinion of the Owner to care for, preserve and protect the Deliverables. During the period of suspension, the Contractor shall only be entitled to be reimbursed for its reasonable, proper and actual expenses in caring for, preserving and protecting the Deliverables. Should the period of suspension last longer than

thirty (30) consecutive days or such longer period as the parties may agree upon in writing, either party to the Contract may consider the Contract to be terminated by mutual agreement without further liability.

8.08 Alternative Dispute Resolution

Differences between the parties as to the interpretation, application or administration of the Contract or any failure to agree where agreement between the parties is called for, herein collectively called “disputes”, shall be settled in accordance with the Owner’s Alternative Dispute Resolution Procedure, as found on the Town of Bradford West Gwillimbury’s website: http://www.townofbwg.com/twnsrv/finance/purchasing

C) GENERAL SPECIAL PROVISIONS

GSP 1.0 Access to Site

1.01 General

Access roads/routes are required as part of the Contract to facilitate construction operations, delivery and unloading of equipment and materials, mobility and operation of construction equipment and advancement of work operations.

Access for the deliverables of this Contract shall be obtained from existing roads.

The Contractor shall be responsible for all re-grading of existing roads, landscaping and access routes used for purposes of site access. He shall also be responsible for the restoration of all existing roads and landscaping to preconstruction conditions or better. Any damage to trees or other property caused by the Contractor's site access shall be corrected to the Contract Administrator's satisfaction at the Contractor's expense.

Unlicensed vehicles and construction equipment shall not unnecessarily block, interfere with or disturb an unprotected lane or pathway or field entrance except where prior authorization is received from the Board.

The Contractor shall plan and schedule the routes of construction and delivery vehicles to, from and within the job site, so that vehicular movements are accommodated with minimal interference and interruption to public traffic. Access routes shall be established to allow vehicles to merge with public traffic and to avoid crossing traffic lanes.

The Contractor shall obtain the Contract Administrator's prior approval for the location of any other construction access not described by these Special Provisions. The Contract Administrator reserves the right to alter, reject or close same as considered necessary. The Contractor shall notify suppliers of materials and equipment of the location and proper use of the access points.

1.02 Additional Provisions for Road Allowance Access

- Attend to utility locates
- Provide traffic control during use as required
- Provide temporary access ramp and culverts in any ditch if required
- Culverts to be a minimum of 600mm dia. in any temporary access
- Remove any temporary access at end of project and restore lands, road boulevards or channels by grading and seeding, if required.
- Haul away any vegetation removed
- Provide mud and dust control as necessary
- Prepare any previous green area ready for seeding and then seed.

1.03 Payment

There will be no separate payment for access provisions.
Works to provide (as required), maintain and restore access routes are to be considered general work with no separate payment.

GSP 2.0 As-Built Drawings/Information

The Contractor shall document and mark all field changes including, but not limited to, changes to invert levels, elevations/grades, alignment, and pipe sizes etc., carried out during the performance of the Contract, on the Contract Drawings. The Contractor shall submit three (3) sets of redlined marked up Contract Drawings and one electronic version, containing all information, to the Contract Administrator to their satisfaction, prior to the issuance of the Substantial Completion Payment Certificate per GC 8.02.03.05. One redlined hard copy to be provided to the Owner. If no changes are made to the work shown on a drawing, the drawing is to be included as shown by this RFT.

GSP 3.0 Changes in Deliverables

The Owner shall have the right at any time to order changes in the Deliverables in accordance with the terms and conditions detailed herein. Any such change shall be made pursuant to a written change order form executed by the Contractor and Owner, prior to the undertaking of the additional Deliverables ("Change Order").

Except as stated in the Change Order, the Deliverables shall remain unaltered and the rights and obligations of the parties shall remain unaltered and in full force and effect. Each Change Order shall set out the change in the Deliverables, the reason for the change and the cost of such change. Unless indicated on the Change Order, the additional Deliverables shall not impact the schedule.

Each Contract Change Order, unless otherwise specified, shall be deemed to incorporate the terms and conditions of the Contract and shall be deemed to be part thereof.

The Owner and Contractor shall have the right to change, amend or modify the form or content of a Contract document in regard to matters, which do not affect the nature of Work, by Contract amendment, which shall be executed by the Owner and Contractor. Contract documents, except to the extent stated in the Contract amendment, shall remain unaltered and in full force and effect.

GSP 4.0 Clearing

There will be minimal to no clearing necessary on this project, and where any is necessary, it will be deemed to be part of the listed work items.

Clearing includes brushing and grubbing wherever necessary.

OPSS 201 will also apply to any clearing work.

Any clearing work, if required, is to be undertaken by power brushing or by excavation and off-site disposal of the brush and/or trees and/or roots.

In a power brushing procedure, generally trees may be ground from the top down, may be felled and then ground by either excavator mounted grinders or by grinders that are self-propelled or towed. The work is to be undertaken so that the chippings are confined to the construction zone. Chippings will be allowed to fall in canals to be backfilled or outside of the working limits only if use of normal care and operation by equipment, in the Engineer's opinion, has been exercised and pre-approval is given. Any chippings that fall on a roadway must be removed by brushing or sweeping or equivalent.

Buildings are to be recognized by power brushing so that the spray of chips is directed away from buildings.

Where chainsawing and off-site disposal occurs, the Contractor will be required to locate disposal sites.

All roots are to be separately excavated and disposed of at an off-site location.

GSP 5.0 Construction Dates of Substantial and Final Completion

5.01 Dates of Substantial Performance/Completion

Substantial performance shall be by _____ with total completion being achieved no later than _____.

Substantial performance shall be determined as outlined in the *Construction Lien Act.*

The Contractor shall be deemed to have met total completion when all required surface asphalt is complete and all Deliverables have passed inspection and testing requirements, the Contractor has rectified all deficiencies in the Deliverables and all other obligations under the Contract have been fulfilled.

The General Special Provision ***GSP 70.0*** with respect to Time for Substantial Completion shall also apply.

An application by the Contractor for an extension of time once Deliverables has commenced shall be made to the Owner, in writing, within five (5) Working Days of the occurrence of the incidence causing the delay.

If the time for substantial completion of the Contract is affected by additional work, the Owner shall extend the applicable date of completion to compensate for such work.

GSP 6.0 Construction Timing/Constraints

6.01 General

At the time of the pre-construction meeting, the Contractor must submit his Progress Schedule to show how work will be completed by the Contract Time and how it will implement the considerations listed below.

6.02 Additional

a) No in-water canal or ditch work can occur from April 1 to June 15 unless permitted otherwise by the Project Manager or Engineer where work in accordance with General Special Provision ***GSP 31.0*** re In-Water Work has been authorized and is undertaken.

b) Work is to occur to minimize the closure of River Road, Hillsview Road or Canal Road during planting season (April 15 to June 1) and harvesting season (September 15 to November 15).

GSP 7.0 Construction Yard / Staging / Stockpile Area

One construction yard (minimum) is to be developed for equipment and materials storage and staging.

The Contractor may undertake private negotiations with any landowner for lands to be used as a construction yard. Any agreements or understandings for such will be between the Contractor and the landowner.

The Engineer's responsibility will be only to ensure that environmental and traffic concerns are recognized in any construction yard.

For any yard used, the Contractor is to ensure that such is maintained and restored to original condition upon completion of activities.

Agricultural activities cannot be impeded by the development and use of a construction yard/staging area.

Sanitary and garbage matters are to be provided and attended to on each site.

The Contractor is to construct a suitable access (6m minimum width) to any construction yard/staging and/or stockpile area and with compacted subgrade, 250mm of compacted Granular B and 150mm of compacted Granular A or approved equal. A culvert deemed in good condition and at the required grade shall be constructed below the access with a size as provided by the Engineer. The location of the access is also to be approved by the Engineer.

The construction yard shall be a minimum of 15m from any watercourse (unless otherwise approved), and shall be constructed so as to maintain drainage.

Wherever the site consists of topsoils, stripping and windrowing of the topsoils is required. Upon completion of use of the site, topsoils are to be replaced and graded. Wherever the site consists of a granular surface, additional Granular A materials are to be supplied and applied as part of this item.

Where the site is to be used as a temporary stockpile site, once the stockpiled materials are removed and hauled to their final location and this site is no longer used, the area is to be regraded.

The full perimeter of a stockpile is to be enclosed by silt fencing if required by the Contract Administrator and with payment as per the Provisional Item Special Provision ***ISP 18.0*** for silt fences.

Silt fencing is to be removed upon completion of use.

External drainage to any stockpile site is to be collected by interceptor ditches and carried around the boundary of the site and then upon abandonment of the site, the intercepting ditches are to be regraded to their prior condition or as directed by the Engineer.

Should any fuel spills or other environmental damage occur, the site shall be cleaned and restored as directed by the Contract Administrator and/or by the MECP.

Sign-off letters from all private landowners whose properties may be used as a construction yard/stockpile/staging area are required upon completion.

The Contractor is to provide sufficient parking area and space on the yard for use by the Engineer and Project Manager.

No separate measurement for payment for attending to the work of any construction yard or staging/ stockpile area will be made, since such work is to be included as general work and thus be part of other items tendered. Silt fencing if required will be paid as part of the provisional item.

GSP 8.0 Contract Drawings

A full list of the contract drawings pertaining to this RFT is enclosed with ***Appendix E***.

GSP 9.0 Contractor's Signing Authority

The Contractor shall submit to the Contract Administrator, prior to commencement of the Deliverables, a list showing names and specimen signatures of its designated staff, who will have the authority, on the Contractor's behalf, to sign, and receive the following during the term of the Contract:

a. Owner's Daily Inspection Report;
b. Daily Work Record;
c. Instruction Notice(s); and
d. Change Order(s)

The Contractor shall inform in writing to the Contract Administrator as and when any changes to its designated staff are made.

GSP 10.0 Coordination / Cooperation with Others Required

10.01 For GPS Surveys by Engineer

The Contractor is to ensure that the Engineer's staff is notified of all construction that requires surveys by the Engineer, and the Contractor is to co-operate to allow the Engineer's staff to GPS all such construction. (GPS – Global Positioning System)

Also the Engineer will GPS all exposed irrigation, drain and well line work and the Contractor is to ensure that the Engineer is advised of, and given the opportunity, to do such prior to backfill and that the Engineer has access to the site to do such.

10.02 For Ontario Land Surveyor, Environmental and Geotechnical Consultants, Building Condition Inspectors, Irrigation Specialists

If an Ontario Land Surveyor is on the site at any time to survey, reference and/or replace survey bars that are known and/or found and that will be damaged/removed by the work, the Contractor is required to allow the Ontario Land Surveyor to attend to his required work with reasonable un-interruption.

Similarly the Contractor is to co-ordinate and co-operate with the Environmental or Geotechnical Consultant who may be on site from time to time to take soils, sediment and water samples and to attend to other surveys as required for geotechnical or environmental purposes.

This coordination and operation also applies to those retained, if any, to inspect nearby buildings and those retained to assist in maintenance of irrigation work.

10.03 For Utility Work

The Contractor will be required to coordinate his work with, and cooperate with, the work of others as necessary and as involved with utility work, as described by General Special Provision ***GSP 74.0*** herein.

10.04 General

There will be no separate payment for coordinating and cooperating with others. Such is to be deemed to be part of other items tendered.

GSP 11.0 COVID-19 Safety Policy

The Contractor shall provide a copy of their COVID-19 specific health and safety policy. Government guidelines for the construction sector are available at: https://news.ontario.ca/opo/en/2020/04/health-and-safety-association-guidance-documents-for-workplaces-during-the-covid-19-outbreak.htm and https://www.ihsa.ca/Urgent-Notices/COVID-19-Links-Resources.aspx.

As applicable, the Contractor's policies and procedures should address communication, project meetings, site access for visitors, transfer of documents, physical distancing, personal hygiene, personal protective equipment, portable restrooms, site cleaning, worksite monitoring and worker self–assessment. It is the responsibility of the Contractor to communicate this policy to subcontractors and all other persons on site.

The Contractor may be required to update its COVID-19 safety policy during the contract if the government policies and recommendations due to COVID-19 change.

At all construction meetings; everyone must be 2m apart and no documents can be transferred.

GSP 12.0 Depth of Excavation and Trench Stabilization

The Contractor shall provide, at all times, sheeting, shoring, bracing, draining, pumping, and dewatering equipment as required for maintaining any trench or open cut, in a dry, straight and stable condition. Unless specifically included in the Schedule I: Items and Prices, the cost for the above shall be included in the tendered unit price for channel, culvert or maintenance hole work. No separate payment shall be made for the equipment, labour, and materials necessary to perform this work.

The Contractor shall schedule the work so that there will be no open excavation adjacent to a lane carrying traffic overnight and on non-working days except when approved by the Contract Administrator. Excavations within three (3) metres of any travelled lane shall be protected with pre-cast temporary concrete barriers (TCB`s). Excavations within 1.5m of the travelled lane shall be backfilled to profile grade at the end of each day's work. No separate payment shall be made for the equipment, labour, and materials necessary to perform this work.

GSP 13.0 Designated Dump/Disposal/Stockpile Sites

13.01 For Surplus Excavated Materials

There are no designated dump sites and the Contractor is to locate his own disposal site at no additional cost to the owner.

13.02 For Imported or Salvaged Earth and Granular Fill

The construction yard is to be used if any site outside the construction zone is required for temporary storage of earth or granular fill (whether excavated or imported) and whether later to be disposed of off site or incorporated into the work.

GSP 14.0 Dewatering Excavations

All deliverables shall be provided under a dry condition. The Contractor shall make all provisions necessary to prevent flow of water into any excavation and shall provide and keep in operation in each section of the Deliverables when and where necessary, dewatering systems of sufficient capacity to keep the bottom of any excavation or trench dry and free from water at all times until the section of Deliverables has been completed. The Contractor shall provide for the disposal of the water removed from the excavation so that it shall not be injurious to public health, private property or to any operation of the Deliverables completed or under construction by the Contractor or others.

Daily pumping of seepage or rainfall waters is expected to be minor, i.e. much less than 50,000 litres per day, based on experience with previous and recent similar adjacent work, and as evident from geotechnical investigations and trench work for exposures during the design period.

However, it is to be noted that should it be necessary for any reason to draw waters from an existing water body for backfill or restoration purposes in excess of 50,000 litres per day, or to pump ground waters from a trench in excess of 50,000 litres per day, or to pump from a trench normal storm runoff waters (seepage) in excess of 400,000 litres per day, or to pump a combination of ground waters and normal runoff waters in excess of 400,000 litres per day, registration pursuant to the Environmental Activity and Sectors Registry or a permit to take water (a PTTW)will be necessary and it will be the Contractor's obligation to apply for and obtain successful registration and/or the permit. The Board can make available previous application and permit data with respect to PTTW's. Pumping of storm waters from extreme storms is not subject to this section.

The Contractor shall provide Drawings of any dewatering system if needed and proposed for use to dewater, for review and approval by the Engineer.

Should the Engineer determine that the needed dewatering is of such significance that a Dewatering Specialist with approved qualifications is necessary, the Contractor shall retain such a Dewatering Specialist to prepare a dewatering plan.

The Contractor shall take all necessary precautions to prevent damage to any Deliverables during and after any needed dewatering construction, and shall be responsible for the repair thereof.

Dewatering shall conform to OPSS 517, OPSS 518 and SSP 517.f.01.

Any generators used by the Contractor for dewatering shall include protective noise shields and mufflers. In addition, any generators required to operate beyond core working hours must have an enclosure to reduce noise to an acceptable level and as such, comply with the Towns Noise By-Law.

The Contractor shall be solely responsible for all the cost of installation, operation, maintenance and removal of any dewatering system necessary to accomplish the Deliverables.

GSP 15.0 Disposal of Surplus Excavated Material and Removals

The Contractor shall dispose of, all surplus excavated materials, removals, grindings, and all other debris, in accordance with the appropriate Provincial Ministry (OPSS 180) and other applicable legislations / regulations. The Contractor shall be responsible to make arrangements for this disposal.

The Contractor shall assume full Ownership of the surplus excavated material and shall be solely responsible for its removal and disposal. The Contractor shall indemnify and hold the Owner harmless against all claims, demands, actions, suits or proceeding which may arise in connection with the excavated material and the handling and disposal thereof.

Stockpiling of excavated excess material within the Owner's road allowance is not permitted. The Contractor shall dispose of all excess excavated material off site immediately upon removal or shall stockpile such on any construction yards/stockpile site secured by the Contractor in accordance with the General Special Provision ***GSP 7.0*** re Construction Yard/Staging/Stockpile Area. No additional payment will be made for costs incurred as a result of this requirement.

GSP 16.0 Dust Control

Dust Controls shall conform to the requirements outlined in General Special Provision *GSP 20.07*, Environmental Obligations.

The Contractor will be responsible for dust control at all times during construction by watering and calcium application, every day and on Saturdays (if worked) and as directed by the Contract Administrator. No separate payment will be made for calcium and water. This shall be considered part of the General Work of the Contract.

The Contractor shall make provision for maintenance of the "open" municipal roadway during weekends and other non-working days, including grading, and street cleaning.

GSP 17.0 Duties and Authorities of Owners' Representatives

Definitions for the Contract Administrator, the Project Manager and the Engineer are included in the Instructions to Bidders section. Each may have assistants or inspectors or survey staff to assist them.

In these Special Provisions, the words "Contract Administrator" or "Engineer" and/or "Project Manager" are used randomly, but not incorrectly, due to the incorporation of previously prepared specification/provisions that have referred to one or the other. However, the Contractor shall consider that either the Project Manager or the Engineer may fulfill any of the duties, responsibilities referred to the Contract Administrator.

Should the Contractor disagree with the instructions, orders, decisions, advice from either the Project Manager or the Engineer, he may request that the two discuss and confirm the instructions, orders, decisions or advice.

On this project, both the Project Manager and Engineer will be on site at irregular times during construction.

The Holland Marsh Drainage System Joint Municipal Services Board (exclusive of the Project Manager who acts as an agent of the Board and who will be on site frequently), and the Town of Bradford West Gwillimbury may have representative staff on site at various times. If any requests, orders or directions are received from these representatives, the Contractor is to immediately refer the representatives to the Project Manager and/or Engineer for further direction to the Contractor with respect to such communication.

GSP 18.0 Emergency Telephone Numbers of the Contractor

Prior to commencing the Work, the Contractor shall provide the Owner with the name(s) and telephone number(s) of his/her representative(s) who can be contacted on a 24-hour basis in case of an emergency during the term of the Contract.

GSP 19.0 Emergency Work Due to Flooding and Accidents

19.01 Emergency and Maintenance Measures – General

Whenever the construction site is unattended by the general superintendent, the name, address and telephone number of a responsible official of the contracting firm shall be given to the Contract Administrator. This official shall be available at all times and have the necessary authority to mobilize workmen and machinery and to take any action directed by the Contract Administrator in case emergency or maintenance measures are required regardless whether the emergency or requirement for maintenance was caused by the Contractor's negligence, Act of God, or any cause whatsoever.

Should the Contractor be unable to carry out immediate remedial measures required, the Board will carry out the necessary repairs, the costs for which shall be charged to the Contractor.

19.02 Emergency Measures Due to High Flows/Flooding

High rainfall events forecast by Environment Canada may result in the Engineer directing the Contractor to implement emergency provisions.

Upon passage of flows causing the emergency and when and as designated by the engineer, the Contractor may resume the normal work. Work may have to be done to reconstruct works already constructed.

The payment for emergency work would be on a time and material basis using realistic unit prices for the equipment in use and with a payment of realistic invoices for materials at a markup of 10%.

Similarly, realistic hourly labour costs would be paid. The costs would be paid both for the removal of added features and for the reconstruction of any previous work. There would be no payment made for standby time while the flood event occurs.

19.03 Emergency Measures For Project Accidents and Malfunctions

The Contractor is to provide for the following to minimize accidents and malfunctions related to work done:

- Monitor as-constructed work for possible signs of erosion and sloughing.
- Continuously inspect equipment for damaged fuel lines and possible spill occurrences
- Inspect road embankments continuously for signs of failure

- Have ample supply of pylons and signs to cordon off any accident site
- Have on site traffic control signs for traffic movement in accident areas
- Have emergency contact numbers available at all work locations

19.04 Emergency Measures for Non-Project Accidents

The Contractor is to attend to the following provisions for other and non-work related accidents:

- If a traffic accident should occur on a road adjacent to the work activity, all works must temporarily cease.
- The Contractor is to assist in mitigating the immediate situation, is to supply and place pylons that he has available and is to provide traffic control.
- These provisions will apply regardless of whether the accident is due to the Contractor's activities or is unrelated but in the area of the Contractor's work.
- The Contractor is to notify the Contract Administrator and Spills Response personnel should a spill occur. (Refer to Contact List in General Special Provision ***GSP 32.0)***.
- Payment for such measures due to accidents by others will only be made when the Engineer feels such are justified and will be made using reasonable hours and rates and on a time and materials basis.

GSP 20.0 Environmental Obligations

20.01 General

It is intended that the Deliverables be executed in such a manner that to the fullest extent possible, minimizes any adverse effects on the natural environment of the project area.

The environmental conditions of the Contract stated herein must be complied with in all respects. It is the responsibility of the Contractor that all their personnel be sufficiently instructed so that the Deliverables is carried out in a manner consistent with minimizing environmental impacts. The Owner may, in its sole discretion, assign a site inspector whose responsibility will be to ensure compliance with environmental objectives.

The Contractor shall comply with applicable Federal and Provincial and Municipal laws, orders and regulations concerning the control and abatement of water pollution. The Board will have obtained any required permits for approvals from the Conservation Authority and from Fisheries and Oceans Canada (DFO) for the work listed herein.

For general environmental compliances, the Contractor shall:

a) Confine operations to limits of the construction zone described.
b) Provide access roads to the construction zone and on the site in locations acceptable to the Contract Administrator.
c) Make adequate protection for, and take precautions at times of, inclement weather.
d) Maintain ditches and watercourses for surface water drainage of site and external properties during construction, and bear the responsibility for damage that may result by reason of not doing so.
e) In general, restore the site to condition equal to or better than existing conditions.
f) Restore lands outside of the limits of the working area but which are disturbed by the work, to their original condition in addition to complying with any related specific provisions as contained herein.

Details of specific environmental obligations follow.

20.02 Noise Regulations

The Contractor shall comply with all local municipal bylaws and, if required, will be responsible for obtaining any exemption from the bylaw. In addition, the Contractor shall ensure the following:

a) Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to proper muffler systems, properly secured components, and the lubrication of all moving parts. Idling of equipment shall be restricted to the minimum necessary for the proper performance of the specified Deliverables.

b) Heavy breaking, grinding and use of pneumatic equipment will not be permitted during night time hours from 7:00 p.m. through to 7:00 a.m., Monday to Friday and from 7:00 p.m. Friday night until 9:00 a.m. Saturday morning. No heavy breaking, grinding and use of pneumatic equipment will be permitted on Sunday and Statutory Holidays.

c) Adjacent residential owners are to be notified 48 hours in advance of any permitted activities that may occur from 7:00 p.m. to 7:00 a.m.

20.03 Archaeological Finds/Heritage Resources

In the event that deeply buried archaeological, historical artifacts or human remains are uncovered, work in the immediate area shall be terminated immediately, and the Contract Administrator and the appropriate Provincial Ministry shall be notified immediately.

20.04 First Nations Excavation and Disclosure of Findings

Should any site excavation unearth bones, remains or other such archaeological evidence of a native burial site, as obligated under the Cemeteries Act, the Contractor will notify the Owner's Contract Administrator, who will in turn arrange contact with the nearest First Nations group. The Contractor shall cease all work that would jeopardize the sanctity of the site until direction is provided by the Owner.

If any new, undisclosed or unforeseen issues should arise that have the potential for anticipated negative environmental impacts, anticipated impacts on a First Nations treaty and/or other protected rights, the Contractor shall notify the Owner's Contract Administrator.

20.05 Erosion and Sediment Control

The Contractor must prepare and submit a detailed description and drawing of their proposed Erosion and Sediment Control Plan (ESCP) to the Contract Administrator and receive approval for such plan prior to commencing the work. The specifically required erosion and sediment measures as outlined in the drawings shall be included in the ESCP to be prepared. The ESCP elements must be installed to the satisfaction of the Contract Administrator, in a staged manner, prior to the commencement of the work. This program must be in accordance with Ontario Guidelines on Erosion and Sediment Control for Urban Construction Sites (May 1997 or latest revision) and OPSS 577.

In the event that the Contract Administrator determines that the Contractor is not working in accordance with the Contract or other environmental regulations, policies or guidelines, the Contractor shall cease those operations, as identified by the Contract Administrator, which are causing contamination of the environment. Such operations shall remain suspended until otherwise directed by the Contract Administrator.

20.06 Spill Reporting

Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the

Contract Administrator and to the MECP Spills Action Centre (see ***GSP 32.0***). Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1990.

All spills or discharges of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps, and liquid type transformers under the control of the Contractor, and all spills or discharges from this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCBs and shall forthwith be reported to the Contract Administrator.

This reporting will not relieve the Contractor of their legislated responsibilities regarding such spills or discharges.

At the conclusion of the Contract work, a thorough clean-up of the construction site shall be undertaken by the Contractor to the complete satisfaction of the Contract Administrator as part of this Contract. No separate payment will be made for any expense to the Contractor as a result of this clean up.

The provision of OPSS Provincial Form 100, Environmental Incidents (Section 7.13) shall also be regarded with respect to spills.

20.07 Dust and Mud Control

If the construction site is close to homes, commercial and office space then close control must be employed to keep dust from forming and blowing.

a) The Contractor shall be responsible for the prompt and complete cleanup of all dirt and mud deposited on the traveled portion of the roadway as a result of their operation on this Contract. In the event the Contractor fails in their obligation the Contract Administrator may proceed with the necessary cleanup and charge all costs associated with the cleanup to the Contractor.
b) The Contractor shall employ only wet type equipment for saw cutting, concrete grinding to control dust nuisance
c) All trenches and disturbed areas by construction works that will produce dust shall be maintained dust free by an application of calcium chloride liquid 35% (min) at the Contract Administrators orders.

No separate measurement for payment will be made for any additional expense to the Contractor as a result of complying with the requirements and carrying out the Deliverables described under this Environmental Obligations provision.

GSP 21.0 Encountered Environmental Features Eligible for Payment

21.01 Species at Risk

Where the Contractor is required to suspend his activities due to the finding of a Species at Risk and where unable to move to an adjacent area for work immediately, stand-by payments will be made.

If the Contractor is able to move easily to an adjacent area, no additional payments will be provided.

If the work must be altered due to the finds, the Engineer will negotiate payment for such modifications on a pre-agreed amount or on a time and materials basis.

21.02 First Nations Artifacts and Burial Sites and Other Archeological Concerns

If any artifact or burial or other archeological site is encountered, similar provisions with respect to encountering a species at risk site will be applied for reimbursement.

GSP 22.0 Fencing

22.01 General

No fence work is to be expected on this FRT.

22.02 If Unexpected Fence Work is Encountered

Should an existing fence that is not noted be encountered, it is to be noted prior to work, and is to be pre-discussed with the Contract Administrator.

Existing fences, if encountered, are to be moved and replaced wherever materials are suitable for salvage and reuse and where movement is required/reasonable.

Where materials are not suitable, new materials are to be provided and payment will be made as per the supplier's invoices with a 10% mark-up.

If farm fences are encountered and have to be removed to allow work, the landowner is to be pre-notified so he can provide temporary fencing where necessary for access or animal control.

Upon completion of work, fences are to be re-erected to equal or better condition.

Any new farm fence is to be comparable in style or type to existing unless landowner agrees to pay the Contractor directly for upgrade

Where any transverse fence may terminate at the edge of work, the Contractor may be required to supply a new end panel with connections in accordance with OPSD 971.101 and with no additional payment.

A sign off letter from any affected landowner re satisfaction of farm fence work is to be requested. Where the landowner refuses to sign off, the Engineer will determine what, if any, further work is necessary.

Should unexpected privately or publically owned fence work be encountered requiring unexpected work, payment will be made as per the contract change order work provisions of this RFT.

22.03 Fencing for Barricades

Snow fence or temporary concrete barricades shall be erected in areas where there exists, in the opinion of the Contract Administrator, a danger to pedestrian or vehicular traffic as per the Occupational Health and Safety Act (OHSA). Open cut areas that are not backfilled prior to the weekend and holidays shall have concrete barriers as well as amber flashing lights installed prior to closing down the operations.

If the Contractor refuses to comply with the request from the Contract Administrator to install the snow fence or temporary concrete barricades as requested, the Owner reserves the right to install the fence or temporary concrete barricades and will apply the costs against the Contractors next payment.

There will be no separate payment for Fencing for Barricades.

GSP 23.0 Field Office/Site Office (for Contract Administrator)

A separate field office or site office is not required for the Contract Administrator. However, if the Contractor should provide a field/site office for his own use, such field/site office is to be available for use by the Contract Administrator when needed.

GSP 24.0 Frozen Ground Conditions

No compensation will be made to the Contractor for frozen ground conditions. Frozen excavated material shall not be placed into the trench as backfill.

GSP 25.0 General Work

25.01 General

All general work items on this contract are to be deemed to be included as part of contract items. There will be no separate measurement for general work items. The items that could be considered as general work could include:

Access – Providing, Maintaining, Restoring, Removing
Attendance at meetings
Clearing
Collecting and disposing of debris from the site
Construction yards/Staging Areas
Coordinating & cooperating with others
Daily Mail Delivery Provisions
Dewatering (where not part of a payment item)
Environmental Obligations
Fencing (other than encountered and unexpected fencing)
Initial Construction Activities/Site Preparation
Landowner Garbage Collection Provisions
Mobilization/Demobilization
Moving/Disposal of Debris
Municipal Road Signage (Existing)
Providing and maintaining sanitary facilities for workers
Providing and maintaining on-site garbage containers
Public Convenience and Safety
Quality Control of Material (by Contractor)
Restoration
Safety and Labour Certificates
Securities and Insurance
Sharing any Contractor Field office
Site Drainage
Soils Investigations
Survey Layout
Surveyor's Stakes and Monument Protection
Temporary Power
Traffic Control
Utility Work
Weather Related Provisions
Working Area

25.02 Work

Components of general work to be done are discussed elsewhere in these General Special Provisions sections or in the Supplemental General Conditions.

25.03 Payment

The tendered amounts for all other items will be payment in full for all labour, equipment and materials for all work that may be encountered of a general nature.
The Contractor shall make his own determination of all the items that should be considered as general work.

GSP 26.0 Granular A

This General Special Provision applies to the preparation and proof rolling of any subgrade or Granular B surface to the satisfaction of the Contract Administrator prior to placement of Granular A, and then the supplying, placing, fine grading and compacting of specified depth of Granular A to 100% of the material's Standard Proctor Maximum Dry Density (SPMDD).

Granular A materials are to have 0% asphalt coated particles derived from RAP, and 0% of blast furnace slag material.

Salvaged, reclaimed, previously used Granular A materials will not be accepted.

Granular A for driveways and for road crossings will be subject to this Special Provision.

Granular A supplied for other purposes such as for pipe bedding or backfill to pipes, manholes and concrete construction is to be included with the item applicable.

Should shouldering be necessary as per a provisional item, this General Special Provision shall apply to such.

The Contractor shall identify the source of the Granular A material ten (10) working days prior to placement if required by the Contract Administrator.

The sources of the Granular A must be a recognized source and acceptable to the Contract Administrator.

Work is to be in accordance with OPSS 314, OPSS 1001 and OPSS 1010.

Granular A that becomes contaminated due to Contractor's activity, shall be removed and replaced at no extra cost to the Contract.

Water and/or calcium chloride shall be supplied as required for compaction and/or dust control.

Where required to do so by the Contract Administrator, the Contractor shall perform QC testing at the discretion of the Contract Administrator. Written test results for the gradation must be received by the Contract Administrator within 4 hours of when the sample was taken.

The Contract Administrator may also have the Geotechnical Consultant perform random testing of all material for compliance with specifications. If any granular material fails on a gradation analysis, the faulty material shall be replaced at the Contractor's sole cost.

The Project Administrator's Geotechnical Consultant will attend to compaction testing as per ***GSP 's 30.0*** and ***52.0*** and OPSS 501.

With respect to surface tolerances, for a finished Granular 'A' surface on which hot mix asphalt is to be placed, the finished granular surface shall not deviate more than 10mm from the required grade and cross section and the surface shall not deviate more than 10mm at any place as measured in any direction with a 3m straight-edge.

There will be no separate measurement of or payment for Granular A except when used as shouldering material or where directed by the Contract Administrator. Elsewhere the work re Granular A is to be deemed to be part of another specific contract item.

GSP 27.0 Granular B Type II

This General Special Provision applies to the preparation and proof rolling of the excavated subgrade and/or of the Select Subgrade Material surface to the satisfaction of the Contract Administrator prior to placement of Granular B Type II and then to the supply, placing, fine grading and compacting of specified depth of Granular B Type II to 100% of the material's Standard Proctor Maximum Dry Density (SPMDD).

Granular B Type II material is not to include any blast furnace slag on this project.

Type I material will be accepted provided the percentages of asphalt coated particles derived from reclaimed asphalt pavement (RAP) and/or blast furnace slag is 0% for either.

Salvaged, reclaimed, previously used Granular B materials will not be accepted.

Granular B for driveways and for asphalt areas will be subject to this Special Provision.

Granular B supplied for other purposes such as for bedding or backfill to pipes, manholes or cast-in-place building slabs is to be included with the item applicable to the pipes, manholes or cast-in-place concrete construction.

The Contractor shall identify the source of the Granular B material ten (10) working days prior to placement if required by the Contract Administrator.

The sources of the Granular B must be a recognized source and acceptable to the Contract Administrator.

Work is to be in accordance with OPSS 314, OPSS 1001 and OPSS 1010.

Granular B that becomes contaminated due to Contractor's activity, shall be removed and replaced at no extra cost to the Contract.

Water and/or calcium chloride shall be supplied as required for compaction and/or dust control.

Where required to do so by the Contract Administrator, the Contractor shall perform QC testing at the discretion of the Contract Administrator. Written test results for the gradation must be received by the Contract Administrator within 4 hours of when the sample was taken.

The Contract Administrator may also have the Geotechnical Consultant perform random testing of all material for compliance with specifications. If any granular material fails on a gradation analysis, the faulty material shall be replaced at the Contractor's sole cost.

The Geotechnical Consultant will attend to compaction testing as per ***GSP's 30.0*** and ***52.0*** and OPSS 501.

There will be no separate measurement of or payment for Granular B. The work re Granular B is to be deemed to be part of another specific contract item.

GSP 28.0 Haul Roads

Where roads are not specially identified in the Contract as haul roads, there shall be no restriction on roads to be used as haul roads.

If any public road to be used as a haul road is damaged by construction traffic, the Contractor shall perform such Deliverables on the haul road, as necessary to provide safe passage and control of traffic thereon and shall on completion of the hauling operation, place such material

and perform such Deliverables as ordered by the Owner to restore the road to its original condition without delay.

The Contractor shall consider access for the delivery of materials, equipment and the movement of such equipment in the preparation of unit or lump sum prices for the Deliverables. No claim or request by the Contractor for additional monies in this regard shall be considered.

GSP 29.0 Initial Construction Activities / Site Preparation

Prior to any construction work, the required pre-construction site meeting shall be implemented.

The first item of construction work is to be the erection of construction signage, if any, as per the requirements of General Special Provision ***GSP 72.0***.

Then the environmental items shall be addressed, i.e. straw bale dams, temporary sediment traps.

Prior to commencement of excavation, any fences encountered shall be addressed, any necessary brush and scrub removal is to be attended to and any movement of junk, debris, etc. is to be addressed.

Also prior to excavation, the Contractor and the Contract Administrator shall inventory any municipal signs located within the contract limits; the Contractor shall remove the signs and posts as they impede his operation all the while remaining cognizant of his responsibility to control traffic; and the Contractor shall deliver the removed signs and posts to a site designated by the Contract Administrator. The provisions of ***GSP 39.0*** also apply re existing Municipal Road Signage.

All work described herein shall be deemed to be general work with no separate payment.

GSP 30.0 Inspection and Testing

The inspection and testing of all Deliverables shall be carried out by the Contractor, Owner and/or the Contract Administrator in accordance with ***GSP 52.0*** and the applicable Item ***ISP's*** and General ***GSP's*** to determine whether or not all Deliverables meet the requirements of the Contract.

Any material or Workmanship which fails in any way to meet the terms of the RFT is subject to rejection or to be purchased on an adjusted price basis. The decision of the Owner shall be final.

All cost associated with the inspection or testing of any service/material that does not meet the Owner's specification, shall be charged to the Contractor.

The Contractor shall give the required days or hours of notice of any operation that requires either inspection or measurements by the Contract Administrator and/or Geotechnical Consultant as set out in the applicable ***GSP's*** and/or ***ISP's***. If no time is set out, the minimum notice to be given is to be forty-eight (48) hours.

GSP 31.0 In-Water Works

In-water work cannot occur in the period of April 1 to June 15 unless specifically authorized by the Contract Administrator

GSP 32.0 Landowners/Agencies Emergency Contacts

Telephone numbers of landowners will be provided at the time of project start up. Each landowner shall be notified prior to work as required by the Contract Administrator.

Emergency use telephone numbers of other contacts of interest are as follows:

Agency	Phone No.
HMDSJMSB (The Board)	905-778-4321
HMDSJMSB (Drainage Supt – Frank Jonkman)	905-775-5366, ext. 2501
Hydro One	1-888-664-9376*
Bell Canada	1-866-301-1942
Enbridge Gas	1-877-362-7434
Ministry of Environment, Conservation & Parks (MECP) - Spills Action Centre	1-800-268-6060
DFO	1-800-565-1633
MNRF Aurora	905-713-7400
LSRCA	1-800-465-0437
Town of Bradford West Gwillimbury	905-775-5366
K. Smart Associates Limited	519-748-1199
(Geotechnical Consultant)	To be provided at start up

* *See other data in* ***GSP 74.0.***

GSP 33.0 Landowner Garbage Collection Provisions

During construction the Contractor shall coordinate with the garbage/recycling collection agencies and homeowners to ensure that residential garbage and recycling containers are transferred from lots to a suitable location for pick-up.

GSP 34.0 Liquidated Damages

(a) Liquidated Damages for all work except Surface Asphalt

It is agreed by the parties to the Contract that in case all work other than defined under the Contract for Surface Asphalt is not substantially finished or substantially completed by the substantial completion date as set forth in Section ***GSP 5.0*** herein, damage will be sustained by the Owner due to the failure of the Owner to ensure the work of this project is substantially complete by the date to have such work done, and that it is, and will be, impracticable and extremely difficult to ascertain and determine the actual damage which the Owner will sustain in the event of, and by reason of, such delay and the parties hereto agree that the Contractor will pay to the Owner the sum of five thousand dollars ($5,000.00) for the liquidated damages for each and every calendar days' delay in substantially or completely finishing the work as required in year 20____ in excess of the substantial completion date prescribed and it is agreed that this amount is an estimate of the actual damage to the excess of the prescribed time of substantial completion in year 20____ as set out in Section ***GSP 5.0*** hereto.

The Owner may deduct any amount due under this paragraph from any monies that may be due or payable to the Contractor on any account whatsoever. The liquidated

damages payable under this paragraph are in addition to and without prejudice to any other remedy, action, or other alternative that may be available to the Owner.

If the time available for the substantial completion of the work is increased or decreased because of an overrun or under run of a major item in the Contract, the Owner may revise the completion date by adding or subtracting days there from, as the case may be, the number of days calculated on the average daily production of the most productive 50% of the working time shown on the Contractors Schedule, divided into the difference between the actual quantity and the estimated Tender quantity, provided that this basis for calculation may not be used where in the opinion of the Owner, all or any of the relevant major items are carried out concurrently.

The major items in this contract for purposes of Liquidated Damages are defined as any item comprising more than 25% of the total contract value.

(b) Liquidated Damages for Surface Asphalt
It is agreed by the parties to the Contract that in case the Surface Asphalt required by the applicable ISP of this Contract is not substantially finished or substantially completed within one year of the substantial completion date as set forth in Section ***GSP 5.0*** herein for all other work, damage will be sustained by the Owner due to the failure of the Owner to ensure the surface asphalt work of this project is substantially complete, and that it is, and will be, impracticable and extremely difficult to ascertain and determine the actual damage which the Owner will sustain in the event of, and by reason of, such delay and the parties hereto agree that the Contractor will pay to the Owner the sum of five thousand dollars ($5,000.00) for the liquidated damages for each and every calendar days' delay in substantially or completely finishing the surface asphalt work as required in excess of the substantial completion date prescribed and it is agreed that this amount is an estimate of the actual damage to the excess of the prescribed time of substantial completion for surface asphalt as set out herein.

The Owner may deduct any amount due under this paragraph from any monies that may be due or payable to the Contractor on any account whatsoever. The liquidated damages payable under this paragraph are in addition to and without prejudice to any other remedy, action, or other alternative that may be available to the Owner.

(c) It is possible liquidated damages on this project could be applicable in two separate years.

GSP 35.0 Material and Equipment Movements

The Contractor should be careful to choose and operate their equipment to avoid any damages. Any asphalt, entrances, shoulders or grass areas which are damaged by the Contractor due to their operation will be replaced by the Contractor to the satisfaction of the Contract Administrator at the Contractor's expense.

The Contractor is responsible for providing all necessary flag person(s), temporary accesses, barricades and detour signs, as per OPSS General Conditions (GC 1.05). All costs for flag person(s), accesses, barricades, and signs shall be the Contractor's responsibility. The Owner will not entertain any extra claim for these Deliverables.

The Contractor shall utilize the appropriate equipment to ensure that all construction activities take place within the road allowance.

Trespassing onto private properties shall not be allowed.

GSP 36.0 Meetings – Pre-Construction, Progress, Post-Construction

The Contractor's representative(s), as requested by the Owner, shall attend all meetings required prior to and or during the project. This shall include the preconstruction meeting, regular bi-weekly progress meetings, pre-pave meeting(s), co-ordination meeting(s), emergency meeting(s), and the post construction meeting.

Prior to commencement of the Work, the Contractor shall attend a pre-construction meeting with the Owner's representatives to establish site protocols and emergency contacts. The Contractor shall prepare and submit at the pre-construction meeting, a detailed construction schedule showing the tasks/activities start and completion dates, milestones and critical activities to meet the specified Substantial Completion Dates. Data re subcontractors and emergency contacts is also to be provided. Such schedule shall be reviewed by the Owner's representative and, when accepted, shall form the baseline for monthly tracking of the Work progress.

Selected landowners, municipal representatives and affected utilities and agencies may be invited to meetings.

The Contractor's representative(s) attending meetings shall be thoroughly versed and knowledgeable with respect to the proposed topics of discussion and shall have the authority to make the necessary decisions and commitments with respect to matters agreed upon at the meetings.

The pre-construction meeting is to occur seven (7) days before construction start up. The Contract Administrator will organize and convene the pre-construction meeting.

The post-construction meeting is to occur just prior to the issuance of Substantial Completion/ Performance for all work other than Surface Asphalt.

GSP 37.0 Mobilization/Demobilization

The moving in and the moving out of all plant and equipment including necessary moves during construction is to be considered as general work. No separate measurement for payment for mobilization/demobilization will be made, since such work is to be considered as general work and be included as part of other items tendered.

GSP 38.0 Moving/Disposal of Debris

Wherever any small structures, appliances, old vehicles or debris piles, etc. or similar exist in an area of existing canal or in an area of excavation for relocation, the landowner will be advised by the Contract Administrator that such structure, vehicle, equipment, etc. is to be removed beyond the work area. If the landowner does not move such, the Contractor is to relocate such outside of the area to be used for leveling, for any windrow stockpile area or for clearing or excavation for new canal work.

The relocation shall be made to minimize damage to the item(s) being moved but shall be consistent with the type of equipment available on site to move such and as a result if damage should result after reasonable care has been given, such will be tolerated.

No additional payment will be made.

GSP 39.0 Municipal Road Signage

Existing municipal signage which must be removed to complete the work is to be replaced as found in approximately the same location as found.

Stop signs that must be removed to complete the work must be temporarily relocated so they are visible at all times and are to be replaced as found in the same location as found.

Existing municipal signage to remain visible at all times for emergency vehicles.

Temporary measures may be required. Existing municipal signage which becomes redundant by the works will be transported to the Township's Public Works yard.

GSP 40.0 New Materials

All materials that are to be manufactured or fabricated for use as Deliverables on this project are to be new materials/products. Used, reclaimed or refurbished materials, items or components are not to form part of any manufactured or fabricated component of this project, unless specifically authorized.

GSP 41.0 Non-Assignment

Neither this Contract nor any Work to be performed under this Contract or any part hereof may be assigned by the Contractor without the prior written consent of the Owner. Such written consent however shall not under any circumstances relieve the Contractor of his/her liabilities and obligations under this Contract and shall be within the sole and unfettered discretion of the Owner.

GSP 42.0 Non-Use of Excavated On-Site Material

Excavated on-site organic or peat materials from any construction are not to be used as fill for any component of work unless approved for use as topsoil as per other provisions of this RFT. All excavated materials are to be disposed of off site and at the full cost of the Contractor.

GSP 43.0 Non-Waiver

No condoning, excusing or overlooking by the Owner of any default, breach or non-observance by the Contractor at any time or times in respect of any provision herein contained shall operate as a waiver of the Owner's right hereunder in respect of any continuing or subsequent default, breach or non-observance or so as to defeat or affect in any way the rights of the Owner herein in respect of any such continuing or subsequent default or breach, and no waiver shall be inferred from or implied by anything done or omitted by the Owner save only an express waiver in writing. Any Work completed by the Owner required by this agreement to be done by the Contractor shall not relieve the Contractor of his/her obligations to do that Work.

GSP 44.0 Notification of Project Manager, Engineer & Landowners and Release Letters

At the time of the pre-construction meeting, contact data will be supplied to the Contractor for the Project Manager, Engineer and landowners.

The Contractor shall ensure that any landowner abutting the canal corridor and affected is contacted by the Project Manager prior to starting work to verify work that may extend onto his lands beyond the new canal and dyke as applicable.

As well, at the end of construction, the Project Manager will attempt to obtain from each such landowner a statement in the form of a letter or email indicating that any such work on the landowner's property has been performed to the landowner's satisfaction.

If the Project Manager has tried but is unable to get such letter/email from the landowner, the Project Manager and the Engineer will determine if and what further work is required by the Contractor prior to releasing the Contractor from the work without the landowner's letter/email. At least two weeks' notice should be given to each landowner re the two times of contact.

GSP 45.0 Original Ground Acceptance

Prior to the start of any Deliverables on the work site, the Contractor shall review the original ground elevation data provided by the Owner and provide in writing that he accepts the original ground data as correct and accurate. This original ground acceptance shall be completed within two (2) weeks from the date of Execution of Form of Agreement. If the Contractor commences with any earth works on site prior to issuing said acceptance letter or does not provide the acceptance letter within the time frame allotted, then the original ground data provided by the Owner will be taken as accepted by the Contractor. The Contractor will not be compensated for any additional costs based on acceptance of the Owner's original ground data.

Should the Contractor not accept the Owner's original ground elevation data, the following information/data shall be submitted along with a rejection letter. Failure to submit all supporting data with the rejection letter shall mean that the Contractor has accepted the Owner's original ground elevation data. All the following data shall be submitted to support the Contractor's claim:

a. Geo-referenced CAD file of the Contractor's original ground survey showing all shots taken, showing the triangulated surface, showing contours (1.0M –major & 0.25M – minor).
b. Contractor's original ground cross-sections super-imposed on the Owner's cross-section which was provided to the Contractor at the project initiation meeting.
c. The input survey file used to create the triangulated original ground surface CAD file in item #1 above.
d. The raw survey file(s) from the survey data collectors

GSP 46.0 Private Driveways

The Contractor shall at no time use any private driveway for the purpose of turning or storing of any trucks, cars, equipment or any vehicles used by his/her employees or sub-Contractors' employees.

The Contractor shall notify (in writing), with 24 hour advance notice, all residents that will have their respective driveways affected by the construction works. No driveway shall be out of service for a period longer than one working day. All driveways shall be reinstated for weekends and holidays. The Contractor shall maintain vehicular access to driveways and entrances, at all times except as noted by General Special Provision ***GSP 72.0***.

GSP 47.0 Project Information Signs

Not required on this contract.

GSP 48.0 Providing and Maintaining Sanitary Facilities for Workers

In carrying out the Deliverables, or any portion thereof, sanitary facilities for workers must exist on-site at all times.

The work will, as a minimum, involve providing one “Port-a-Potty” or equivalent in an easily accessible, well drained and level location. The facility must include hand sanitizer.

The facility must have tie-down provisions to guard against wind damage.

A maintenance and removal contract must be executed between the supplier of the facility and the Contractor.

A record of maintenance must be posted and updated as applicable at the site of the facility.

The facility is to be placed within the construction zone but not on a road allowance at the time serving the public.

The work with respect to provision and maintenance of the sanitary facilities is deemed part of the General Work Item.

GSP 49.0 Providing and Maintaining On-Site Garbage Container

In carrying out the Deliverables, or any portion thereof, an on-site garbage facility for domestic type of garbage containment and disposal must exist at all times.

The work will, as a minimum, involve providing one metal garbage container, with an easily opened and closed metal lid and with a latch to prevent animal tampering.

The facility must have tie-down provisions to guard against wind damage.

A maintenance and removal contract must be executed between the supplier of the container, if applicable, and the Contractor. Weekly removal of the garbage is to be provided by the Contractor.

The facility is to be placed within the construction zone but not on a road allowance at the time serving the public.

The work with respect to provision and maintenance of the on-site garbage container is deemed part of the General Work Item.

GSP 50.0 Provisional / Contingency Items

Provisional/Contingency Items, including a Lump Sum Contingency Allowance, have been/will be identified in this RFT. Payment would only be made under these items if the work is required, authorized and applicable. However where the work is directed to be done, the Schedule of Items and Prices will apply for payment. Each Provisional/Contingency Item may

be discussed in the Item Special Provisions Section that follows. To allow Provisional/ Contingency unit prices to be tendered, provisional quantities are established herein. These quantities are hypothetical and are not intended to imply the extent of Contingency work that may or may not be necessary. The lump sum contingency item will not be an amount that is paid. Approved change orders are monies that the lump sum contingency item is intended to offset in whole or in part.

GSP 51.0 Public Convenience and Safety

In carrying out the Deliverables, or any portion thereof, the convenience of the public must always be considered and provided for by the Contractor. The Contractor shall not obstruct any road, pedestrian access or field access, longer or to any greater extent than is absolutely necessary. He shall in no case tear up or open up more of any road, pedestrian or field access than is required or sanctioned by the Contract Administrator.

The Contractor at all times shall provide perfectly safe, ample and convenient means of approach and entrance to adjoining lanes, driveways, buildings and field property, both for vehicles and farm equipment. In order to comply with the foregoing the Contractor if necessary shall construct and maintain, in good and serviceable condition, suitable and convenient platforms, approaches, structures, bridges, crossings or other Deliverables.

The Contractor during the progress of the Deliverables shall keep the site in as tidy a condition as practicable. He shall not deposit any material on any portion of road, pedestrian access or field access, or other of the Owner's property without the permission of the Contract Administrator. He shall remove any material without delay when directed by the Contract Administrator. Upon completion of the Deliverables, he shall remove all false Deliverables, plant or surplus materials, as well as any rubbish accumulated due to their operations, and shall leave the site in a condition satisfactory to the Contract Administrator.

All surplus material, or plant, rubbish, false Deliverables, etc. shall be removed from time to time, when and as directed by the Contract Administrator. If this requirement is not complied with the Contract Administrator will proceed to do whatever is necessary to restore the site to an acceptable condition, and charge the cost thereof to the Contractor. Whenever and wherever any work is finished, suspended or stopped for the winter, all equipment and material of every description must be removed from the site.

The Contractor shall, at their own expense provide, erect and maintain all requisite barriers, fences, warning flashing lights and any other protection including watchmen, as may be necessary or as ordered by the Contract Administrator. Should the Contractor neglect to carry out the above requirement, the Contract Administrator shall place such watchmen, lights, barriers, etc., as required, and charge the cost to the Contractor, without relieving the Contractor of any claims for damages or accident.

The Contractor shall, where it is practicable in the opinion of the Contract Administrator, keep any roadway open for travel for the use of the public, for such width as the Contract Administrator may direct. The Contractor shall also provide a sufficient number of "No Thoroughfare" or other proper signage, which shall be placed in conspicuous places whenever any roadway, field or pedestrian access is too dangerous to be used. The Contractor shall maintain this signage in good order as long as the conditions remain unsafe or unfinished.

No separate measurement or payment will be made for any additional expense the Contractor may incur as a result of complying with the above requirements.

GSP 52.0 Quality Control of Materials

The Contractor shall submit samples of Granular materials, any select sub grade materials and any imported clay or top soil, and the mix designs of asphalt within six weeks after award of the Contract or sooner if and as required by a specific ***GSP*** or ***ISP*** for approval by the Contract Administrator.

Required testing/sampling results of granulars, select subgrade materials and imported topsoil to be used shall also be submitted for approval to the Contract Administrator within the six (6) weeks or sooner as required by specific ***GSP's*** or ***ISP's***. The Geotechnical Consultant may also be notified so he/she may attend at the material source on site for sampling and testing two weeks prior to bringing any of these materials on site.

No material shall be delivered to the site and/or placed until approved.

Routine tests on materials will be carried out by the Owner at no cost to the Contractor. When routine tests by the Owner indicate materials do not meet specification the Contract Administrator may require documentary evidence to the effect that materials supplied by the Contractor comply with the terms of the Specifications. Such evidence must be provided by the Contractor in the form of a certified copy of a laboratory report from a recognized testing company acceptable to the Contract Administrator. The Contractor shall pay for the entire cost of such laboratory report of samples.

All cost associated with the inspection or testing of any service/material that does not meet the Owner's specification, shall be charged to the Contractor. Any costs of replacement of materials or deliverables that do not meet the Owner's specifications will also be a cost to the Contractor.

The Contractor shall give forty eight (48) hours' minimum notice of any operation that shall require either inspection or measurements by the Contract Administrator and/or Geotechnical Consultant. Additional notice is to be given if and as required by a specific ***GSP*** or ***ISP***.

With respect to on-site compaction testing, the Contract Administrator shall provide compaction test results to confirm that fill materials are compacted to the specified density. At least one set (four holes) of test results may be taken from each compaction operation. The Contract Administrator shall determine the location of the test holes. If the compaction does not meet the specification, the material shall be re-compacted and a new set of compaction tests will be taken.

With respect to asphalt, the Contractor will be required to submit asphalt mix designs to the Contract Administrator for approval. Material approvals/pre-approvals/quality control for asphalt cement and for the hot mix asphalt shall be in accordance with OPSS 310 and shall be performed by the Contractor where required or by a recognized testing company acceptable to the Contract Administrator on the Contractor's behalf. The cost of any asphalt quality control described and required by the Contractor shall be borne by the Contractor and shall be deemed to be included in the applicable unit prices. The Owner shall also have off-site and on-site sampling and testing undertaken as required and as per the Item Special Provisions.

Sampling and inspection required for any applicable materials is further discussed in the General or Item Special Provisions for the applicable material.

GSP 53.0 Restoration

In general, the Contractor shall restore all features damaged or destroyed during the construction of the services under this Contract to the satisfaction of the Owner and at no cost to the Owner.

When completing work under this contract, restoration of existing facilities outside of the construction zone such as roadways, road allowances, dykes, driveways, and green areas if disturbed by the Contractor's operations shall be restored like other items of work as described in this General Special Provision.

All restoration work must be carried out simultaneously with the contract progress as directed by the Contract Administrator.

In the event that the Contractor fails or neglects to make satisfactory progress in the execution of any restoration work within forty-eight (48) hours of the receipt of written notice from the Contract Administrator, the Contract Administrator may remove or cause to be removed any surplus material or to re-grade any area or perform any work which he deems necessary to leave the site in an approved condition and the cost of any such work shall be charged to the Contractor and shall be deducted from any monies due or to become due him.

Roadways, entrance driveways, or other surfaces subject to vehicle or farm traffic shall be reinstated with a minimum of delay and inconvenience to the general public and shall be maintained in a satisfactory condition until completion and final acceptance of the works by the Contract Administrator.

Failure to maintain the roadways, driveways and walkways in an acceptable condition, shall result in the work being undertaken directly by the Contract Administrator with the costs to be deducted from any monies due the Contractor by the Board.

Where established lawns or other landscaped areas within or adjacent to the construction zone, or elsewhere if damaged by the Contractor, are excavated or otherwise damaged, these areas shall be restored by grading, topsoiling and seeding according to the Contract Administrator's satisfaction. Watering of seed will be necessary.

Should it be determined that any septic beds intrude into the construction zone and that such are accidentally damaged by the Contractor, corrective measures will be attended to by the Board. There will be no separate payment to the Contractor for any delay, inconvenience, or need of cooperation caused by the occurrence of a septic bid, unless the Contract Administrator directs the Contractor to attend to the corrections. In such case, the work will be paid as Change Order work.

GSP 54.0 Salvaging of Structures/Material

There will be no requirement to salvage structures including any posts and anchors, any metal pipes, etc. other than the requirement to salvage existing municipal road signage. The Contractor shall have full rights to all other removed materials and must dispose of them.

The Contractor shall locate his own disposal sites for all removed materials.

GSP 55.0 Securities and Insurance

All costs to supply and maintain the necessary bonds, irrevocable letters of credit, certified cheques, bank drafts/cheques and/or money orders and insurance that are used as surety and insurance throughout this contract including the maintenance period are to be considered as general work.

Refer also to _____.

No separate payment for attending to the securities and insurance will be made, since such are to be considered as general work and are to be included as part of other items tendered.

GSP 56.0 Select Subgrade Material

Where any select subgrade material is applied and placed the following provisions will apply.

- The provisions of ***GSP 30.0*** and ***GSP 52.0*** apply with respect to sampling and testing.
- The SSM shall be supplied, placed, fine graded and compacted to 100% of the material's Standard Proctor Maximum Dry Density (SPMDD).
- Work is to be in accordance with OPSS 314, OPSS 1001 and OPSS 1010 (MUNI).
- The Contractor shall supply a sample of the SSM for testing by the Geotechnical Consultant ten (10) working days prior to placement.
- Water and/or calcium chloride shall be used as necessary for compaction and/or dust control but no additional payment will be made for the supply and placement of the water and/or calcium chloride required.
- The Geotechnical Consultant may advise on methods of placing, lift thicknesses and compaction methods. The Consultant also will attend to compaction testing as per ***GSP 30.0*** and ***GSP 52.0*** and OPSS 501 and any material that fails the compaction testing will not be accepted until compaction is adequate.
- No separate measurement for payment for attending to select subgrade work will be made, since such work is to be part included as part of other items tendered.

GSP 57.0 Shop Drawings and Working Drawings

At this time shop drawings should not be necessary for any item. However, should shop drawings be required, the following shall apply.

For the portions of the work to be completed under this Contract where detail drawings are to be supplied by the Contractor, one (1) electronic copy, in an unrestricted PDF format and four (4) paper copies of same, together with specifications plus such additional copies as the Contractor and their subcontractors may require, plus design calculations where specified, shall be submitted to the Contract Administrator for review.

The Contractor or their subcontractor shall check and initial all shop drawings before submission to the Contract Administrator so as to intercept and correct any major errors or omissions. Shop drawings will not be reviewed by the Contract Administrator unless they have been previously checked by the Contractor. Work which relates to the shop drawings shall not be carried out before the Contract Administrator's review of the shop drawings is complete. The Contractor shall provide the shop drawing submissions with the overall project schedule in mind and allowing sufficient time for the review, approval, manufacturing/fabrication and installation.

The review of the Contract Administrator is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the Contract Administrator approves the detail design inherent in the shop drawings, responsibility for which shall remain

with the Contractor submitting same, and such review shall not relieve the Contractor of their responsibility for errors or omissions in the shop drawings or of their responsibility for meeting all requirements of the Contract Documents.

The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub trades.

GSP 58.0 Shot Rock

Shot rock is to be used on this RFT as riprap protection at culverts and/or elsewhere, as rock protection material.

Shot rock is to be graded crushed rock (quarry/bedrock) with a minimum stone size of 150mm and a maximum stone size of 400mm. Sufficient fines are to be included with the materials to completely fill voids. Some clay materials (up to 10%) may be mixed in, on site, with the shot rock materials.

The provisions of OPSS 511 and 1004 are to be considered where applicable.

Materials are to be placed to a 500mm thickness where used as slope and/or culvert riprap/protection and should be placed on a 2:1 slope or flatter. Use on a steeper slope is to be only if directly approved by the Engineer. Where specifically noted, shot rock thicknesses may be reduced to 300mm thickness. A reduction in maximum size particle to 200mm is to be made in 300mm thicknesses.

The materials are to be placed on a geotextile fabric unless specifically deleted.

Geotextile Filter Fabric satisfying OPSS 511 and equal to Terrafix 270R/400R is to be used. No addition in payment will be made for adding filter fabric.

Shot rock on slopes is to be placed such that the toe of the material is placed to a minimum width and depth of 1m, and the material is to be placed to a 1m minimum width at the top of the riprap area, and to a 0.5m thickness.

All shot rock is to be counter-sunk/recessed into the surface of the slope.

Shot rock shall be tamped /rolled in placed to ensure voids are minimized and to maximize density of shot rock. Preapproval of the Contractor's method of placing and tamping/rolling is required and reviews will be made of shot rock placed to determine if sufficient tamping/rolling is provided to minimize voids and to maximize density of shot rock

The Contractor will be required to obtain pre-approval of the source(s) of the shot rock material.

The Engineer may require samples of the shot rock placed so that analyses can be made to confirm compliance with composition requirements of this specification.

The Geotechnical Consultant may be requested to attend at source to review and comment on the material to be used and may attend on site during placement to sample and comment on materials used and methods of placement to minimize voids.

Shot rock may also be required at outlets of surface water routes into ditch work.

There will be separate measurement for payment for shot rock required as per this RFT except where any item specifically states the shot rock is not to be separately paid. The payment for the contract item for shot rock shall be payment in full for any shot rock required by the drawings or by the Contract Administrator, and is to include excavation, materials, filter, placement and grading.

GSP 59.0 Site Drainage

The Contractor shall be responsible for maintaining site drainage until the project is complete.

GSP 60.0 Smog Alert Days/Suspension or Restricted Work

In the event of a Smog Alert issued by Environment Canada, the Contractor shall take all precautionary measures to ensure the safety of their employees. Procedures should be put in place to ensure that environmental conditions are considered, such as:

- Schedule the use of gas powered equipment to the morning hours.
- Re-fuel equipment before 8:30 a.m. and after 3:00 p.m.
- Reschedule jobs that require the use of oil based paints, solvents and other organic based compounds. This also includes the use of cleaning solvents during daylight hours.
- Reschedule road resurfacing.
- Avoid unnecessary idling of vehicle engines.
- Reschedule any welding activities.
- Reduce the use of gas-powered lawn mowers, generators, power washers, hedge trimmers, concrete saws, etc.

GSP 61.0 Soils Investigations

No specific geotechnical investigation or report has been prepared as part of the work associated with this RFT. However, exploratory holes have been excavated by the Engineer at various locations during the design period for the purposes of locating existing irrigation and waterlines.

The soil conditions encountered are typical of most locations within the Holland Marsh polder. The typical condition is the existence of 600 to 900mm± depth of peat soils overlaying soft to stiff clayey soils. The peat soils contain scattered remnants of wooded areas – roots, trunks – and some work will be necessary re removal of encountered buried roots, trunk remnants. No groundwater seepage was noted.

In any new pipe or culvert or catchbasin/maintenance hole work, the encountered peat is to be excavated out and disposed of until the clayey silts are encountered. Then a crushed limestone granular bedding is to be placed.

Where any adjacent landowner wishes any excavated peat material to be left for his/her salvage/reuse the contractor shall provide for such.

Photographs of trial trenches for pipe work for a project nearby in the Holland Marsh polder on Wist Road (approximately 2 km east of this site) are enclosed with other drawings since the conditions are deemed similar.

The information given here is for guidance only and is not guaranteed by the Owner. It shall remain the Contractor's responsibility to interpret, review and confirm existing ground conditions and/or recommendations as may be outlined herein.

Each Contractor should visit the site of the work before submitting their Bid and satisfy themselves by personal examination as to the local conditions to be met during construction (including peat depths, ground water seepage) and as to their own estimate of the facilities and difficulties to be encountered during construction including the nature of the subsurface materials and conditions. The Contractor shall not claim, at any time after submission of this RFT that there was any misunderstanding of the terms and conditions of the Contract relating to site conditions. No extra payments or claims will be considered by the Owner related to peat and/or groundwater seepage or control, pumping, or dewatering whether it be by sump pumps or deep wells or any other method required to install the works in this Contract.

GSP 62.0 Standard Specifications and Standard Drawings

62.01 General Specifications and Standard Drawings

Subject to the requirements of the Supplemental Conditions, the General Special Provisions and the Item Special Provisions, the Deliverables on this Contract shall be performed in accordance with the latest revisions of the Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD). Those applicable Standard Specifications and Standard Drawings of the Owner, if any, shall also form part of this Contract.

62.02 Precedence of Standard Specifications and Drawings

Standard Drawings and Specifications of the Owner, Supplemental Conditions, and Item and General Special Provisions included in this RFT shall, when in conflict, take precedence over the Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD).

62.03 Standard Specifications and Standard Drawings

A list of the OPSS and OPSD and Owner Standard Drawings and Specifications, if any relevant to this RFT is set out herewith. The list is prepared for reference only and should not be considered as an exhaustive list of all the specifications and standards that are applicable to this Contract. Any errors or omissions shall not be used as grounds for any claims whatsoever.

Applicable OPSS

MUNI			MUNICIPAL AND PROVINCIAL		
			102	Oct. 1992	Weighing of Materials
			127	Apr. 2016	Schedule of Rental Rates for Construction Equipment Incl. Model & Specification Reference
			128	Apr. 2006	General Specification for Supply of Pre-Qualified Materials and Products
			180	Nov. 2011	Management of Excess Materials
182	Nov. 2012	Environmental Protection For Construction in Waterbodies and on Waterbody Banks	182	Nov. 2012	Environmental Protection for Construction in Waterbodies and on Waterbody Banks
			201	Nov. 2011	Clearing, Close Cut Clearing, Grubbing, and Removal of Surface and Piled Boulders
206	Nov. 2013	Grading	206	Nov. 2013	Grading
212	Nov. 2013	Borrow	212	Nov. 2013	Borrow

MUNI			MUNICIPAL AND PROVINCIAL		
220	Nov. 2014	Wick Drain Installation			
			308	April 2012	Tack Coat
310	Nov. 2017	Hot Mix Asphalt	310	Nov. 2012	Hot Mix Asphalt
			311	Nov. 2009	Asphalt Sidewalk, Driveway
314	Nov. 2015	Untreated Subbase, Base, Surface, Shoulder, Selected Subgrade, & Stockpiling	314	Nov. 2015	Untreated Subbase, Base, Surface, Shoulder, Selected Subgrade, & Stockpiling
			316	Apr. 2008	Construction Specification for Extruded Expanded Polystyrene Frost Heave Treatment
353	Nov. 2019	Concrete Curb and Gutter Systems	353	Nov. 2019	Concrete Curb and Gutter Systems
401	Nov. 2015	Trenching, Backfilling and Compacting	401	Nov. 2015	Trenching, Backfilling and Compacting
			402	Nov. 2013	Excavating, Backfilling and Compacting for Maintenance Holes, Catch Basins, Ditch Inlets and Valve Chambers
			404	Nov. 2010	Support Systems
			407	Nov. 2015	Maintenance Hole, Catch Basin, Ditch Inlet and Valve Chamber Installation
421	Nov. 2015	Pipe Culvert Installation In Open Cut	421	Nov. 2015	Pipe Culvert Installation in Open Cut
			450	Nov. 2012	Pipeline and Utility Installation in Soil by Horizontal Directional Drilling
501	Nov. 2014	Compacting	501	Nov. 2014	Compacting
			506	Nov. 2013	Dust Suppressants
510	Nov. 2014	Removal	510	Nov. 2014	Removal
			511	Nov. 2013	Rip-Rap, Rock Protection and Granular Sheeting
			517	Nov. 2010	Dewatering of Pipeline, Utility, and Associated Structure Excavation
			518	Nov. 2011	Control of Water from Dewatering Operations
539	Nov. 2014	Temporary Protection Systems			
			703	Nov. 2014	Permanent Small Signs and Support Systems
			706	Nov. 2010	Traffic Control Signing
771	Nov. 2014	Standard Highway Fence	771	Nov. 2014	Standard Highway Fence
			801	Nov. 2010	The Protection of Trees
			802	Nov. 2010	Topsoil
804	Nov. 2014	Seed and Cover	804	Nov. 2014	Seed and Cover
			805	Nov. 2015	Temporary Erosion and Sediment Control Measures
904	Nov. 2014	Concrete Structures	904	Nov. 2014	Concrete Structures
1004	Nov. 2012	Material Specification for Aggregate, Miscellaneous			

MUNI			MUNICIPAL AND PROVINCIAL		
1010	April 2013	Aggregates - Base, Subbase, Select Subgrade, and Backfill Material			
1350	Nov. 2008	Material Specification for Concrete – Materials and Production			

Applicable OPSD (Some of which have been included with the drawings of this RFT)

Municipal and Provincial

200.010	Nov. 2009	Earth/Shale Grading, Undivided Rural
206.010	Nov. 2009	Granular Courses, Undivided Rural
206.050	Nov. 2008	Subdrain Pipe, Connection and Outlet, Rural
207.041	Nov. 2008	Subdrain Pipe, Open Graded Drainage Layer, Hot Mix Asphalt, Concrete, or Composite Pavement
219.110	Nov. 2015	Light-Duty Silt Fence Barrier
219.180	Nov. 2015	Straw Bale Flow Check Dam
304.010	Nov. 2009	Shoulder Treatment, Sideroad Intersections
400.100	Nov. 2013	Cast Iron, Square Frame With Square Flat Grate For Catch Basins, Perforated Openings
400.120	Nov. 2018	Cast Iron, Square Frame with Birdcage Grate for Catchbasins
600.030	Nov. 2012	Concrete Mountable Curb with Wide Gutter
601.010	Nov. 2013	Asphalt Curb and Asphalt Curb with Gutter
605.020	Nov. 2013	30° and 45° Asphalt Outlets for Asphalt Curb with Gutter
705.010	Nov. 2014	Precast Concrete Catch Basin, 600 x 600mm
705.030	Nov. 2014	Precast Concrete Ditch Inlet Catch Basin, 600 x 600mm
708.020	Nov. 2011	Support for Pipe at Catch Basin or Maintenance Hole
802.010	Nov. 2015	Flexible Pipe Embedment and Backfill, Earth Excavation
810.010	Nov. 2013	General Rip-Rap Layout for Sewer and Culvert Outlets
1006.010	Nov. 2011	Sewer Service Connections for Rigid Main Pipe Sewer
1006.020	Nov. 2011	Sewer Service Connections for Flexible Main Pipe Sewer

GSP 63.0 Subcontractors

Bidders shall submit a list of their subcontractors at the time of the pre-construction meeting

Bidders shall ensure that all subcontractors selected and named have experience in the subcontract work described, and that they shall execute their work with competence and within the required time frame.

Bidders shall ensure that all subcontractors submitting bids shall be actively engaged in work of the type described and shall be able to show proof upon request by the Board of previous work of similar nature performed by them.

The Contract Administrator reserves the right to reject a subcontractor for reasonable cause (eg. in litigation with the Board and/or Town). Upon such rejection, the Contractor shall be required to propose an alternate subcontractor without resulting change to the Bid.

All subcontractors shall have a current WSIB clearance certificate and a valid insurance certificate prior to commencement of any work under this Contract. The Contract Administrator reserves the right to request copies of these certificates at any time.

The successful Bidder shall be responsible to ensure all subcontractors are employing licensed trades in good standing with the Ontario College of Trades, where applicable and required.

GSP 64.0 Supervision

The Contractor shall provide skilled and qualified supervisory staff on the project at all times to ensure proper execution of the Deliverables. The Contractor shall provide a qualified full time superintendent capable of communicating by both written and oral means to ensure that the Deliverables proceeds in a proper and efficient manner.

If, in the opinion of the Contract Administrator, the assigned superintendent is not competent to carry out appropriate direction of the work, the Contractor shall replace the superintendent immediately upon written request of the Contract Administrator.

All supervisory personnel who will be assigned to this project must be entirely familiar with the terms, conditions and details of the Contract and related documents.

GSP 65.0 Survey Layout

The Contractor shall be responsible for the survey layout. The Item Special Provisions may indicate the further services to be provided, if any, by the Engineer with respect to the provision of data for survey layout.

The Owner shall at any time during construction have the right to check the construction layout for accuracy. If at any time during the progress of the Deliverables any error shall appear or arise in the positions, levels, dimensions or alignment of any part of the Deliverables, the Contractor shall, at his own expense, rectify such error to the satisfaction of the Contract Administrator. The checking of the setting out of any line or level by the Contract Administrator shall not in any way relieve the Contract of his responsibility for the correctness of the Deliverables.

No separate measurement for payment of survey layout will be made, since such work is to be considered general work and is to be included as part of other items tendered.

GSP 66.0 Surveyor's Stakes or Monuments Protection

The area in which the Deliverables is being performed will have marker stakes placed to identify known legal survey stakes and monuments/bars. It shall be the duty of the Contractor and his/her employees to ascertain the location of these stakes and/or monuments and to protect them. Any identified legal stakes or monuments denoting lot or road limits which may become moved or disturbed by the Contractor's operations shall be reset and their location again certified by an Ontario Land Surveyor and at the Contractor's expense.

If the Contractor’s work extends past the defined construction zone and encounters and disturbs unidentified legal survey stakes, monuments or bars, the resetting of such will also be the Contractor’s responsibility. Should the Contractor fail to have these stakes reset promptly, the Owner may hire an Ontario Land Surveyor to do so. All costs in connection therewith shall be paid by the Contractor into the Owner’s Treasury before the final payment is made under this Contract or in the alternative, said cost may be deducted from the Contractor's (progress) payments.

Should unidentified survey stakes, monuments or bars be encountered and disturbed within the construction zone, the cost of replacement of such bars, etc. will be borne by the Owner.

GSP 67.0 Suspension of Work

The owner may in its sole discretion at any time upon notice to the Contractor in writing suspend the performance of the Work, in whole or in part, for a specified or unspecified time.

Upon receiving notice of the suspension, the Contractor shall immediately suspend all operations concerning that identified portion of the Work except such Work as is necessary in the opinion of the Owner to care for, preserve and protect the Work.

During the period of suspension, the Contractor shall only be entitled to be reimbursed for its reasonable, proper and actual expenses in caring for, preserving and protecting the Work.

Should the period of suspension of the Work, in whole or in part, last longer than thirty (30) days consecutive days or such longer period as the parties may agree upon in writing, either party to the contract may consider the contract to be terminated by mutual agreement without further liability.

GSP 68.0 Tack Coat

This General Special Provision applies to the work to supply and place SS1 tack coat on base course asphalt surface from an approved supplier prior to placement of surface course asphalt.

The work is to include cleaning, removal of dirt debris and sweeping of base course asphalt surface, and then the placement of the tack coat.

If a street sweeper is not employed, the materials are to be removed using whatever means are necessary.

Work is to be in accordance with OPSS 308.

The Contractor shall identify, five days prior to use, the supplier and method of application for review by the Contract Administrator and perhaps by the Geotechnical Consultant.

Tack coat application work may also be reviewed by the Geotechnical Consultant, including a review of preparation, conditions, methods, application rates and materials.

Should on-site samples be determined necessary by the Geotechnical Consultant, the Contractor shall assist in providing the samples for testing.

There will be no separate measurement or payment of tack coat. The work re tack coat shall be deemed to be part of the asphalt item.

GSP 69.0 Temporary Water and Power

The Contractor shall make their own arrangements for the supply of temporary water and power. No separate payment will be made for the provision of temporary water and power. This shall be considered part of the General Work Item.

GSP 70.0 Time for Substantial Completion

The Contractor shall complete the Work by the Date of Substantial Completion as specified in General Special Provision ***GSP 5.01*** of the Contract.

The Contractor is deemed to have thoroughly understood the requirements for completing the Work within the specified time for completion and allowed for any additional and/or augmented daylight shifts in his Bid should it be in his/her opinion that there may not be sufficient time for completion by him/her Working a normal number of hours each day or week on a single daylight shift basis. Any additional costs occasioned by compliance with these provisions shall be considered to be included in the prices Bid and no additional compensation shall be allowed therefore.

If the Contractor is delayed in the completion of the Work:

a. By any negligent act of the Owner or any Owner employee;
b. By other utility Contractors such as - Telephone, Cable, Gas, Hydro Contractors unless otherwise stated; other than delay caused by timing of Contractor request for Work to be done by the utilities.
c. For any cause beyond the reasonable control of the Contractor or by acts of God or of the Public Enemy Acts of the Province or of any foreign state, fire, flood, epidemics, quarantine restrictions, embargoes or delays of sub-contractors due to such causes.

Then the time for completion shall be extended in writing at any time on such terms and for such period as shall be determined by the Owner, notwithstanding such extensions, time shall continue to be deemed of the essence of this Contract.

An application by the Contractor for an extension of time once the Work has been commenced shall be made to the Owner in writing within five (5) Working Days of the occurrence of the incidence causing the delay. In the event such application is approved by the Owner, all bonds or other Contract surety furnished to the Owner by the Contractor shall be amended where necessary at the expense of the Contractor to provide coverage beyond the date of any extension of time granted and the Contractor shall furnish the Owner with evidence of such amendment of the surety.

If the time for completion of the Contract is affected by additional Work, the Owner shall amend the date for Substantial Completion established in General Special Provision ***GSP 5.01*** to compensate for such Work. Commencement date of liquidated damages will similarly be amended.

GSP 71.0 Topsoil

This General Special Provision applies to the supply and placement of all topsoil required by the Contract Drawings and/or as directed by the Contract Administrator.

All channel swale work, non-riprapped culvert banks and other disturbed road boulevards shall be topsoiled if not excavated in peat materials (except where noted not to be topsoiled).

All other existing green areas that are to be restored with seed or sod will require a lift of imported topsoil as part of the restoration.

The Contractor shall identify the source of any imported topsoil material ten (10) working days prior to placement if required by the Contract Administrator.

The source of the topsoil must be a recognized south and acceptable to the Contract Administrator

Topsoil used in the area of the Holland Marsh is scrutinized with respect to harmful seeds, plants or weeds, to avoid negative impacts on marsh agriculture.

Topsoil work shall consist of fine grading the sub-grade, and supply, placing and grading of a 150mm depth of imported screened topsoil or approved salvaged topsoil.

Topsoil used shall be from areas which have not had herbicide applied within the last 3 years.

All topsoil is to be pulverized and free of roots, rock, debris, weeds and plant particles.

Work is to be in accordance with OPSS 802.

All topsoil placed during the Contract that becomes contaminated due to the Contractor's activities shall be removed and replaced at no extra cost to the Contract.

The Geotechnical Consultant may review topsoil as placed and test for quality as required by the Contract Administrator.

Where existing on-site topsoils can/may be salvaged and re-used with the approval of the Contract Administrator, imported topsoils will not be required.

However in this RFT, the bidder should base his bid on importing topsoils throughout when required.

There will be no separate measurement for or payment of topsoil. Such work is to be deemed to be part of other items to this contract.

GSP 72.0 Traffic Control and Pedestrian and Vehicular Access

72.01 General

Prior to commencement of the Deliverables, the Contractor shall, if required, prepare and submit to the Owner at the pre-construction meeting for approval a traffic management plan to ensure that vehicular and farm traffic is maintained/controlled in a safe and orderly manner and in accordance with the Contract requirements and Regulations.

The Contractor shall maintain at all-times safe pedestrian, farm and vehicular access to properties, businesses and residences for the duration of the Contract subject to other provisions in these Special Provisions.

Where two lanes of traffic can be maintained but work is adjacent to the road, sufficient signing to notify the travelling public of construction ahead and then pylons or other delineators along the work area will be necessary in accordance with Book 7 or as designated by the Contract Administrator.

Where the operations are such that one lane of traffic must be closed, sufficient signing must be posted ahead to indicate that such is occurring, and then sufficient flagmen, delineators or portable traffic lights are required to protect the lane closed. This work is to be fully done by the Contractor and is to conform to Book 7.

The provisions of Section 72.03 herein regarding access to the Hillside commercial buildings and the Petherick and Beckett residential properties also apply where any one lane closure would affect access to the properties.

When the day's Deliverables are completed, ALL traffic lanes in each direction shall be resumed unless the road is closed in accordance with the provisions of this RFT.

The safe control of traffic through the project shall be the sole responsibility of the Contractor and shall be in accordance with the Ontario Traffic Manual (OTM).

The Contractor shall maintain open local roads through the duration of the Contract free of mud, dust, debris, potholes, and/or obstruction etc. caused by the Deliverables.

All Deliverables necessary to ensure required vehicular, farm and pedestrian access through the project and to the residences and farming operations in the construction zone shall be the responsibility of the Contractor at no additional cost to the Owner.

72.02 Specific

The Contractor is to ensure at all times there is sufficient room for one lane of traffic for domestic, agricultural and emergency use to all buildings and fields on either side of his equipment location.

The Contractor shall provide to the Contract Administrator a photo log of all existing signage prior to the commencement of construction. This photo log shall include sign type, condition and location of sign. All existing signs which require to be relocated shall be removed by the Contractor when construction begins and replaced by the Contractor upon completion. The Contractor shall be responsible for the relocation and maintenance of any regulatory signage located within the construction zone. The Contractor shall be held financially responsible for any damage to existing signs prior to removal or relocation and shall replace any damaged or missing signs at their cost.

The Contractor shall also conform to the following requirements, with any cost(s) associated being borne by the Contractor:

a) Provision of barricades, snow-fence, concrete barriers, etc., required to delineate traffic and secure all work areas from public access;

b) Storage of materials and equipment shall be confined to a location agreed upon by the Contract Administrator and the Contractor;

c) Maintain access to all roads, accesses, and driveways as required;

d) Road Occupancy Permits must be obtained to store materials and/or equipment on Town roads;

e) The Contractor shall notify the Contract Administrator for any removal or relocation of a traffic pole, traffic sign, and/or street name sign;

f) The Contractor shall place temporary concrete barriers with appropriate approach treatments between any work area and driven lanes where the grade difference exceeds 0.6m where the separation is less than 3.0m.

g) The Contractor shall provide temporary pavement markings as directed by the Contract Administrator for traffic control during construction.

h) Prior approval from the Board and Town shall be required for any Monday to Friday work that may be scheduled between the hours of 7:00 P.M. and 7:00 A.M., and for any Saturday work that may be scheduled between the hours of 7:00 AM and 5:00 PM. If approval is granted, associated conditions are to be observed. No work will be permitted on Sundays or on Statutory Holidays.

72.03 Full Road Closure

Where a road is to be closed, the road is to be signed in advance of closure by the Contractor and after sufficient notice has been given by the Contractor. Notices may also be placed in

newspapers by the Board. All emergency agencies (police, fire, ambulance, school buses, roads department) are to be notified by the Contractor or the Contractor is to ensure such notification are attended to by the Board. Before the road is actually to be closed, the detour route must be signed and monitored by the Contractor. Sufficient lead time for all closure notification will be required (a minimum of 4 weeks).

The necessary traffic control plan for road closures is to be prepared and implemented by the Contractor.

Vehicular access will have to be maintained at all times to the commercial buildings (Hillside) on the east side of River Road north of Hillsview Road and to the Petherick and Beckett residential properties on the west side of River Road.

A landowner must be able to reach his property from one end or the other of any area of closure. The only time that a landowner will not be allowed to use his specific laneway is when construction equipment is required to be sitting on or right in front of it. The Contractor is also to co-operate with all landowners and is required to provide his best efforts to ensure that passage of local farm equipment is accommodated.

Access for emergency equipment/vehicles must also be maintained at all times.

Any permit applications with respect to road restrictions or closures will be prepared either by the Project Manager or Engineer and paid directly by the Board. The Contractor's responsibility will be to supply materials including fabricating the signs in accordance with Book 7, erect, maintain and remove all signs, measures (for all roads) included in the traffic control plan and/or as required by the Drawings.

72.04 Maintenance

Maintenance of traffic control devices shall include, but not be limited to, daily inspection of the devices to ensure that they are clean and properly maintained in the desired alignment as set out in OTM Book 7. Cleaning and realignment of devices shall be performed as required. All unacceptable devices shall be replaced as defined in OTM Book 7. A Record shall be kept of the condition of Traffic Control Devices and the maintenance performed including the time of day the check occurred and the time of day the maintenance was performed. The total number of devices in use as well as the time and date of any significant configuration changes shall also be recorded.

The Owner will provide the necessary forms for record keeping. Completed copies of the forms shall be given to the Contract Administrator within twenty-four (24) hours.

At the pre-construction meeting the Contractor shall provide, if required, a Traffic Control Plan and a Schedule of Implementation of Traffic Control Devices for any work where such is proposed.

72.05 Daily Mail Provision Services

During construction, the Contractor shall maintain safe access for the daily delivery of mail by Canada Post to all property owners within the limits of construction.

72.06 Payment

There will be no separate measurement for payment of traffic control as such is to be considered as general work and is to be included as part of other items tendered.

GSP 73.0 Use of Site

The Contractor shall confine all equipment, labour and materials to within the limits of the site, except as may be otherwise permitted by the Owner. The Contractor shall not park any equipment, material or staff vehicles on private property unless approved by the Contract Administrator through prior arrangement with the property Owner.

In addition, the Contractor shall locate any Contractor's trailer and any interim area for storage of materials within an area to be approved by the Owner.

GSP 74.0 Utilities

74.01 General

The location of the utilities as shown on the Contract Drawings are approximate only and the Owner does not warrant the completeness or correctness of the information shown. The Contractor shall verify the completeness and correctness of utilities information in the field, by contacting utility companies, and shall exercise the necessary care in Deliverables operations, to take such other precautions as may be necessary to safeguard the utilities from damages and to repair any utilities damaged during Deliverables at no cost to the Owner. The Contractor shall notify any discrepancy of utility information to the Owner forth with.

The Contractor shall request and obtain locates from all applicable utility companies prior to any excavation. All excavations near the vicinity of any underground electrical utility shall be conducted in accordance with applicable utility company policy/standards.

At the request of the Contract Administrator and/or as set in the Item Special Provisions, the Contractor shall expose those existing utilities that may be in conflict with proposed Deliverables in advance of trench or general excavation in the area.

The Contractor will not be entitled to additional payment for providing support to maintain the existing utilities within their excavation or pavement limits. Smaller sized excavating equipment may also be necessary to maintain adequate clearances from the existing and new utility facilities. Existing services and utilities shall be supported with supports designed by the Contractor and stamped by a Professional Engineer licensed in Ontario and submitted to the Contract Administrator for review prior to commencing excavation. Support designs shall also be approved by the appropriate operating authority.

74.02 Overhead Hydro and Bell Crossings (General)

This special provision applies where overhead utility lines may impact the work.

The drawings attempt to indicate those locations of overhead utility lines.

The Contractor shall review the site and ensure he is aware of locations of overhead utility lines.

The work required by the Contractor at overhead utility lines is to protect such during construction and to avoid methods that may cause contact with the utility line.

Any existing line attached to any pole is to be protected by the Contractor.

Any underground feeds from a pole are to be determined by the Contractor as part of his utility locates.

If any pole requires temporary support during the construction as evident or as requested and directed by the Utility and as approved by the Engineer, the work shall be attended to or arranged by the Contractor and with no additional payment.

Where it is evident that a utility line remains that, in the Contractor's opinion, requires removal and/or relocation to allow the work, the Contractor shall indicate such to the Contract Administrator and the line will be reviewed to determine if it should be removed or relocated. Any costs to remove or relocate a line, if moved after review by the Contract Administrator, will be paid by the Board.

The Contractor must make such pre-inspection and can not claim for standby or delay of work should he encounter an overhead utility line which impacts his work.

The Contractor shall cooperate with, and coordinate his work with, any work by others to relocate or adjust overhead utility lines if such work is occurring simultaneous to the work of this contract.

There will be no separate measurement or payment for locating, support protection and avoidance of overhead utility lines or delays caused by overhead utility lines.

74.03 Underground Utility Provisions

Underground utilities will be encountered. There are underground Bell cables and private waterlines and irrigation lines. At this time there are no known underground hydro or gas lines and such are not expected to be encountered.

Drawings included herein show underground utility locations based on utility company or privately supplied data and based on daylighting performed during the design period.

Effort has been made to ensure all underground utilities may remain with no relocation.

Contractor however is to arrange for all on-site utility locates within the construction zone.

Buried utilities shall be exposed to the satisfaction of the utility company and/or landowner and Contract Administrator to verify that their elevations will not conflict with the construction of the project at the specified elevations, or that provisions for protection and relocation of such utilities may be undertaken if conflicts should occur.

Early exposure by the Contractor and coordination with utility companies and private landowners will be required since there will be no standby payment while waiting for utility work by others unless agreed to by the Contract Administrator.

Protection of the utility during work is necessary.

There shall be no separate measurement or payment to the Contractor for dealing with underground utilities.

74.04 Support of Existing Utilities

All work is to conform with OPSS.MUNI 404 and OPSS.MUNI 539.

There will be no separate payment for costs related to labour, equipment, materials, supervision, coordination, and services required to support any existing above ground and underground utility including any temporary removal/relocation (as required).

To support any utility poles, the Contractor shall retain a qualified company recognized by the Utility Owner. The Contract Administrator shall be notified forty-eight (48) hours in advance of supporting the poles. The Contractor shall not expose and support more than one pole at a time.

If any underground utility requires support, and in accordance with the requirements of the utility, such support shall be provided, maintained and removed when not needed and with no separate payment.

The Contractor will not be entitled to additional payment for the removal of abandoned utilities whether or not the abandoned utilities are shown on the Contract Drawings, unless specified.

The Contractor shall be held responsible for the protection of all services, whether aerial or underground, including telephone cables, hydro cables, watermains, sanitary sewers, gas mains, etc., during the time of construction and will be held liable for any damage to same. Prior to commencing any excavation operations, the Contractor shall provide seventy-two (72) hours' notice to utility companies concerned and arrange for, at the Contractor's own expense, stake outs and any temporary relocations that may be required.

The Contractor is advised the utility information shown in the Contract Drawings is approximate and does not guarantee the accuracy of their locations.

The cost of all damages to utilities both overhead and underground, caused by the Contractor's operations, shall be borne by the Contractor.

74.05 Utility Contact Numbers (for Emergencies)

The current emergency utility contact information is enclosed in General Special Provision ***GSP 32.0*** hereto.

Recent general Bell and Hydro One contacts during design phases have been:

a) Bell Canada
- Andrew Fournier, Implementation Manager, Network Provisioning, 136 Bayfield Street, Floor 2, Barrie, ON, L4M 3B1, Phone 705-797-9977, Cell 705-627-0897

b) Hydro One
- The Hydro One contacts during past projects have been Robert.Paradis@HydroOne.com, Phil.Boyle@HydroOne.com, Z3A.Planning@HydroOne.com and PattiHines@HydroOne.com
- It is expected Phil Boyle will be the primary contact for service connections.
- A specific contact for a recent nearby project was Joseph.Salomone@HydroOne.com, 905-713-1212, ext. 2292

c) Hillside Farms (Tim Vanderkoi) re private waterlines (cell # 905-806-4092 and e-mail tim@hillsidegardens.ca)

The Contractor will be required to confirm that contact data still applies and to obtain new contact data if necessary.

74.06 Payment

Except for the costs to be paid pursuant to ***ISP 5.0*** for pre-location, support and/or reconstruction of traversed water lines, there will be no separate measurement for attending to utilities as such is to be considered as general work and is to be included as part of other items tendered.

GSP 75.0 Valuation and Certification of a Contract Change Order

The Owner will supply all necessary Change Order forms. The forms to be supplied by the Owner will be consistent with the forms used in an MTO contract.

When a Change Order is proposed or required the Contractor shall present to the Contract Administrator, for approval, its claim for changes in the Contract Price and schedule, with the appropriate supporting documentation. The Contractor shall promptly submit, at the request of the Owner, such further and other information and documentation as the Owner considers necessary to assess the claims. The Contract Administrator will assess the merits of the claim and, when approved by the Owner, a Change Order shall be issued to the Contractor amending the Contract Price and schedule as appropriate.

If the type of Deliverables involved in the Change Order is included in the items contained in the Schedule of Items and Unit Prices within the Bid Form, it shall be performed on the same payment basis as the original Deliverables.

If the type of Deliverables involved in the Change Order is not included in the items contained in the Schedule of Items and Unit Prices within the Bid Form and the Owner and the Contractor fail to agree on the method of valuation, measurement and change in the Contract Price the Owner shall order the Deliverables to be performed on a time and materials basis pursuant to ***OPSS GC 8.02.04***.

Notwithstanding any other provision, no payment shall be made to the Contractor for or in respect of hand tools or equipment that are tools of the trade.

Each month, the Contractor shall submit an invoice to the Owner covering Deliverables performed to carry out the Change Order during the preceding month and to the extent that the Deliverables covered by the invoice can be verified by the Owner, the invoice will be processed by the Owner for payment.

The final invoice shall be submitted by the Contractor within twenty-five (25) Working Days after the completion of the Change Order.

Separate invoices shall be submitted in triplicate for each Change Order issued. Each invoice shall include the Change Order number and covering dates of the Deliverables and shall itemize separately, labour, materials and equipment and shall include invoices for materials, rented equipment and other charges incurred by the Contractor in carrying out the Change Order.

If the final invoice and all required substantiation and support are not submitted within twenty-five (25) Working Days after completion of the Change Order it shall be deemed that all invoices for the applicable Change Order have been submitted and no further invoices will be permitted.

Payments in respect of payroll burden will be made at the rate of 26% of wages and salary.

The Owner will reimburse the Contractor for its actual payroll burden if the Contractor provides all relevant accounting information in a format acceptable to the Owner, including a statement from an independent auditor, which establishes to the Owner's satisfaction, that the Contractor's costs are higher than those specified above.

Any Change Order executed by the Contractor and Owner shall be deemed to include any and all costs incurred by the Contractor as a result of the Change Order, including, but not limited

to, labour, equipment and overhead and the Contractor shall not be entitled to claim any additional compensation for these items, including any claims for delay.

GSP 76.0 Weather Related Provisions

76.01 Provisions for Winter Work

There should be no winter work for these Deliverables, but should winter conditions be encountered, the following apply:

- The Contractor is to ensure any site is prepared free of snow and ice for stockpiling of imported earth and is to ensure the materials brought in are dry and are protected from moisture during storage. If the site exists, the soil is to be kept available and dry.
- Where in-water work will occur in winter conditions, the Contractor is to ensure that turbidity curtains are placed to prevent most fish from entering the area during freeze up. Such are to remain in place until the work is done.
- The Contractor is to ensure that ice breakup is undertaken to allow any winter excavation.
- The Contractor is to provide for releveling of all materials levelled/spread in winter conditions in the following construction season.
- All sites are to be prepared in the summer/fall conditions if winter conditions are anticipated.
- Construct earth cofferdams in non-winter conditions.
- Schedule work so that silt fences are constructed prior to winter conditions.
- Provide ice and salt control.
- Keep leveling/disposal areas free of snow build ups.
- Have contingencies for increased road maintenance activities.
- Provide separate stockpile areas for frozen excavated soils.
- Ensure ice control is provided to reduce safety impacts on construction equipment.
- Provide for snow removal activities to allow construction.
- Ensure fuel and fluid lines on all equipment are inspected and kept free from damage by ice and snow.
- Monitor weather forecasts and schedule work to prepare for such.
- Build in allowances for lost time.
- No additional payment will be made for working in winter conditions.

76.02 Provisions for Snow and Ice Control

Whenever excessive snow or ice occurs, the provisions for winter work are to be implemented.

These provisions include protecting materials that are to be used, removing ice as necessary to allow work, plowing snow and stockpiling such as necessary and to suspend work in significant situations.

The Contractor's operations are always to ensure that municipal snow plowing and sanding equipment can operate along any public roads.

No additional payment will be made for snow and ice control.

76.03 Dust Control Plans

Wherever excavation, hauling or other works occur along an earth or granular road, the Contractor will be required to ensure that daily dust suppressant measures are applied, unless in the opinion of the Contract Administrator, due to condition or locations, dust suppressant is not required on the particular day.

The application of dust suppressants will not be separately measured and paid and the work is to be deemed to be part of the General Work Items and/or as part of other Tender Items.

76.04 Provisions for Wet Conditions/Mud Control

Wherever a Contractor's operations involve work on a road or lane, and as a result of the operations earth, peat or other material creates a mud surface on the road, the Contractor, when requested, is to have a loader or similar equipment on site that is capable of removing the majority of the mud from the road.

When a particular section along a road or lane is completed, the Contractor may be required to hire a firm that specializes in washing and brushing the road, and is to clean such to the satisfaction of the Contract Administrator.

All operations of mud control must be such that the removed mud is deposited in backfilled ditches or hauled to a stockpile site as opposed to on the inside marsh lands.

Monitoring of weather will be critical to ensure mud control is attended to prior to freezing conditions or extremely wet or hot conditions.

Separate payment will not be made for mud control. Such is to be part of the work item involved.

GSP 77.0 Weighing Materials To Be Paid on Weight Basis

Tickets shall be submitted to the Contract Administrator at the time of delivery of material to the site. Tickets not signed by the Contract Administrator shall not be accepted for payment.

GSP 78.0 Winter Period

The winter period for the project is from December 1 to April 15.

The Contractor may be allowed to work during the winter period subject to the Owner's consent, and at no additional increase to the Contract unit prices. Thirty (30) days in advance of the winter period; the Contractor shall submit a detailed and realistic schedule of the intended Deliverables to be carried out for the Contract Administrator and Owner' approval. Should the Contractor elect to carry out work during the winter period, the provisions of ***GSP 76.0*** re Weather Related Provisions shall apply and the following requirements must be met:

- All excavations must be backfilled;
- All aspects of the place of work must be left clean, tidy and safe;
- Road subgrade and/or road granular shall not be exposed during the winter shut down, unless approved by the Owner upon written request from the Contractor. The work shall be scheduled such that the asphalt base course is completed on any completed road granular base prior to the winter shut down. Gravel or milled pavement surfaces will not be permitted for the traveled roadway;
- Roadways must have temporary or permanent pavement markings and appropriate traffic signage installed in accordance with OTM, and any construction work areas shall be properly protected from the traveled lanes. A double coat of temporary pavement marking paint shall be applied for any temporary lane marking exposed during the winter shut down period;
- Cut or fill slopes left without vegetative cover or erosion control blankets shall be treated before the on-set of winter with hydraulic mulch ground cover;
- Repairs to the roadway, interim drainage conditions, erosion control, signage and

delineation shall be performed by the Contractor, as required, throughout the winter shut down period;

- The Contractor shall be responsible for snow clearing, snow removal, and de-icing of any areas in which they have elected to perform work during the winter shut down period. Snow in these areas shall be removed from the right-of-way, and must not impede with Owner efforts to keep traveled lanes clear of snow/winter debris; and
- The cost of this work shall be included in Contract unit prices.

The Owner will provide snow clearing and perform de-icing operations for the temporary and permanent roads open to the public during the winter period.

The Contractor shall not commence any work, during winter period, without obtaining the Owner's consent. Working days will not be charged to the Contractor from December 1 to April 15.

The Contractor shall ensure the following minimum requirements; in addition to other conditions, set out elsewhere in the Contract, related to winter shutdown are met by November 30:

- Base Asphalt is completed; and
- Any required temporary line painting is completed.

When the Contractor plans for a lengthy suspension of a project during the winter months, certain procedures shall be employed in order to provide a safe roadway for motorists and accommodate Owner maintenance operations during this period.

78.01 Field Review

Prior to a winter period, a comprehensive field review shall be conducted by project personnel that includes the Contract Administrator, the Owner's representative and the Contractor's representative. This review is intended to identify problem areas that exist, or areas, which may become problems over the period, and to clarify areas of responsibility for maintenance of the roadway during the winter period. The review shall be documented with copies distributed to all participants for better coordination. The procedures outlined herein do not relieve the Contractor of any of their responsibilities under the Contract. As a minimum, the review shall include the following topics.

78.02 Pavement Surfaces

a) Do not leave a centerline drop-off over the winter;
b) Do not leave extensive lengths of cold milled surfaces open to traffic over the winter;
c) If butt joints have to be left over the winter, extend the approach taper to a minimum length of 3m per 10mm of thickness;
d) Do not leave steel plates on the roadway over the winter;
e) Review pavement patches to see if they are relatively flush with the adjacent pavement. If necessary, mill off or fill. If deteriorated areas of the pavement can't be permanently patched, remove loose material and fill with a bituminous sand mix and compact by mechanical means or wheel rolling; and
f) Check to see that manhole covers are flush with the adjacent granular. Provide adequate tapers around exposed castings.

78.03 Shoulders

a) Check for high shoulder areas that could pond water on the traffic lanes. High areas shall be removed by milling or other approved methods in order to ensure pavement drainage;
b) Eliminate pavement/shoulder drop-offs by blading material up to the edge of pavement

or edge of shoulder, as appropriate, and compacting to the satisfaction of the Contract Administrator;

c) Remove all construction debris, such as broken concrete, bituminous material, piles of sand, etc., from within the clear zone;

78.04 Erosion Control

a) Install all temporary erosion control features and any permanent features that can be incorporated before the winter period.

78.05 Drainage

a) Check to see that ditches are not impaired and that culverts are clean;
b) Install sediment basins at the downstream end of culverts. This helps keep silt from accumulating in the pipe. Install filter fence and/or appropriate ditch checks at the upstream end of culverts to keep them clean;
c) Secure closed drainage systems;

78.06 Signs and Pavement Markings

a) All regulatory signs (Stop, Yield, No Passing, Speed Limit, etc.) shall be installed at the proper locations and heights before suspending the project for the winter. Maintenance of these signs is the responsibility of the Contractor;
b) Work zone signing must be reviewed. All temporary sign supports shall be removed. Signs that do not apply to current conditions shall be removed or completely covered. Examples of acceptable sign face coverings are as follows:
   - Plywood
   - Dark canvas material
   - Thick gauge opaque plastic material of a dark color. (plastic garbage bags are not acceptable)
   - Another sign of same size with the backside facing toward traffic.

   Road Construction Ahead Signs shall be removed and/or covered if no unusual conditions will exist over the winter or if the project is physically complete. They will not be used to identify the limits of a project that will resume at some future date. However, they shall be displayed if any one of the following conditions occurs over the winter:

   - Active construction
   - Detours
   - The presence of drop-offs
   - Inadequate striping
   - Inactive stage construction
   - Crossovers
   - Other conditions at Contract Administrator's discretion (Examples: Special conditions, emergency work, construction maintenance type work)

c) Schedule the placement of pavement markings as early as possible to avoid poor weather conditions, specification cutoff dates, and scheduling problems that can and do occur late in the year. If the cutoff date for thermoplastic or epoxy marking cannot be met (due to paving operations for example), place temporary striping for the winter and then place the permanent markings in the spring or summer as the specification allows. Maintenance of pavement markings is the responsibility of the Contractor.

78.07 Traffic Control Surveillance

The Contractor is responsible for maintaining traffic control devices over the winter. For a project that will be inactive over the winter, hazards that would normally require Traffic Control Surveillance shall be eliminated (fill open trenches for example) and, thus, Traffic Control

Surveillance by the Contractor will not be required. However, if conditions exist as described in Article 701.04(b) (2) on an inactive construction project over the winter, then the Contractor shall perform Traffic Control Surveillance as directed by the Contract Administrator.

78.08 Miscellaneous Considerations

a) Review the condition of all entrances, side roads and mailbox turnouts before the winter period. If they are not in an acceptable condition, place enough temporary aggregate or bituminous material to keep them passable for the winter period. Maintenance is the responsibility of the Contractor;
b) For detour roads and bridges, review surface conditions and repair any problem areas;
c) For stage construction projects that must be maintained over the winter, check all traffic control items such as signals, arrow-boards, signs, barricades, barrier walls, etc. to see that they are properly placed and in good working order throughout the winter.
d) Road Closures. Do not close a road for an extended period of time during the winter period (approximately December 1 to April 15). Snow removal becomes difficult if the roadways are inaccessible;
e) Review any special items that are unique to your project for possible problems over the winter. Make corrections before the winter shutdown; and
f) If the Contract calls for removal and re-erection of existing guardrail, do not remove the old guiderail if the new guiderail cannot be installed before the winter shutdown. If this is impractical, provide a temporary barrier over the winter such as an array of impact attenuators
g) Contractors shall familiarize themselves with the Owner's Half Load Restrictions.

The cost of all materials, equipment, and labour necessary to comply with the provisions of the above are included with the various pay items in the Contract.

78.09 Spring Start-Up

At start of the new construction season, a pre-construction meeting will be held. Once construction has recommenced, the Contractor shall submit an updated construction schedule, and the Contract Administrator shall complete an updated Notification of Construction Operations form.

GSP 79.0 Working Area

The working area or construction zone on this project is to be the following.

a) The right of ways of River Road, Hillsview Road and Canal Road where adjacent to the work of this RFT.
b) During the planting to harvesting period, up to a five (5) metre width along the lands owned by, and/or cultivated by Hillside Farm properties and along the lands owned by Korag Farms for purposes of channel work. However, any of this 5 metre width required and used in this period in excess of the width to accommodate the channel and the one metre maintenance width is to be preapproved by the Contract Administrator.
c) During the post harvesting and pre-seeding periods the above 5 metre widths may be expanded to 10 metre widths if required and if preapproved by the Contract Administrator.
d) A ten (10) metre width on lands and/or worked owned by Hillside Farms for installation of a continuous pipe drain or hickenbottom branch drain section.
e) Up to a 10 metre width on the Petherick property along any work area to install the 300mm pipe drain including the well piping work.

These widths also constitute the right of way on private lands.

If the Contractor wishes to use any other area, outside of the working area, the Contractor must make his own pre-arrangements with the landowner(s).

All areas used by the Contractor for access or storage are to be restored to their original condition at the Contractor's expense.

Materials and equipment shall be stored in areas designated or secured by the Contractor as a Construction Yard. Materials and equipment shall not be stored within four (4) meters of an unprotected lane or pathway.

Notwithstanding the foregoing, the Contractor shall, at its own expense, remove any equipment or materials, which in the Contract Administrator's opinion constitute a hazard to traffic or farm operations.

The Contractor shall be responsible for all re-grading of existing roads, landscaping and access routes. He shall also be responsible for the restoration of all existing roads and landscaping to preconstruction conditions or better. Any damage to trees or other property caused by the Contractor's site access shall be corrected to the Contract Administrator's satisfaction at the Contractor's expense.

Unlicensed vehicles and construction equipment shall not travel, work or stop within four (4) meters of an unprotected lane or pathway or field.

D) ITEM SPECIAL PROVISIONS (ISP)

ISP 1.0 Common to all Pipe Drain/Culvert Work

.01 Scope

- This ISP applies to the installation of pipe drains/culverts below roadways, below shoulders and below laneways (and also in transition areas where involved).

- The pipe/culvert material to be used is Higher Density Polyethylene (HDPE) – Boss 2000 series 320 or equivalent.

- Aluminized corrugated steel pipe may be substituted but only if approved beforehand by the Owner/Contract Administrator. If aluminized CSP is approved, wall thicknesses are to be 1.6mm for 300 and 375mm dia. and 2.0mm for 450, 525 and 600mm dia. and 2.8mm for 750mm dia. All corrugations are to be 68 x 13mm.

- This ISP contains specifications (common) that are applicable to all locations of pipe/culvert construction and also contains sub-sections which set out further/specific specifications for specific locations of pipe/culvert construction.

- Separate unit prices are required for each specific location of pipe/culvert construction and payment will be made in accordance with the specific unit prices.

.02 Common Work

- The work will involve any or all of the following:

  b. Layout
  c. Traffic control
  d. Utility pre-location and protection
  e. Excavation
  f. Disposal
  g. Bedding and backfill
  h. Restoration

- With respect to layout, the drawings, including the cross sections, show the required routes of the pipe drains/culverts. It is to be noted that most pipe drain/culverts placed in a length of open channel will be 50 to 100mm lower than the evident ditch grade.

- With respect to traffic control, the provisions of ***GSP 72.0*** are to apply and in each section of work. The specifics of ***GSP 72.0*** that apply are to be confirmed with the Project Administrator. When any pipe drain parallels a road, a minimum of one lane of traffic on the road shall be maintained.

- With respect to utility pre-location including private underground utilities, the work is to involve review of the drawings, arranging for One Call locates and arranging for landowners to attend and advise of locations. If specific and separate exploratory hole work is necessary to confirm underground utility locations and if such is approved beforehand by the Contract Administrator, the Contingency ***ISP 16.0*** will apply for payment of Exploratory Holes. Where any pipe drain/culvert work crosses an underground Bell line, the line is to be carefully exposed and protected. It is expected that no relocation of any Bell line will be required and it is expected that any Bell line can be adjusted, using available slack, and can be placed in the granular backfill zone. Where any new pipe drain/culvert crosses an existing waterline, the work at the waterline crossing is to be as per ***ISP 5.0***. Where any pipe drain/culvert is placed

adjacent to an overhead utility pole, the pole is to be protected (and supported temporarily) where necessary. At three existing poles and brace locations, lengths of pipe drains/culverts are required in order to minimize disturbance to the poles. The closed drain/culvert work at these three pole areas is described in ***ISP 1.0*** including ***ISP 1.11***.

- With respect to excavation, trench widths are to be sufficient to place the pipe and to have 0.3m minimum on each side to allow for tamping/compaction of backfill. Trench walls may be vertical.

- Trench excavation in native soils (including native soils below any fill materials such as at roadways, driveways and lot grading) is expected to be through approximately a one metre depth of peat to an underlying soft clayey silt material. Trench walls in peat excavations may be vertical. In all pipe drain/culverts work the excavation is to continue to the clayey silt materials even if such are deeper than the minimum bedding depth required. The minimum bedding depth is 150mm below the pipe. Elevations of the peat/silty clay interface based on trial trenches excavated are shown on the drawings to be used for this RFT. As a result the unit prices bid and unit for payment will not be modified even if peat depths are found to vary at the time of construction.

- Any trench depth in excess of 1 metre and any trench in fill materials shall have 1:1 side slopes or flatter if soil conditions require slopes to be flatter.

- Should it be necessary to excavate into the underlying silty clays in order to provide the required pipe and bedding, the trench walls may be vertical in the silty clays.

- The trench walls, where excavated through peat (and even if into any underlying clayey soils), are to be lined with an acceptable geotextile that is secured to the trench walls using acceptable staples. The geotextile material to be used is to be preapproved with the Contract Administrator.

- The excavator to be used, is to be suitable for the working width especially where the pipe work is below a shoulder or within a boulevard area so that the excavator may travel along the route of the new pipe drain without affecting adjacent asphalt on a roadway. The excavator is to be able to load excavated materials into rubber tired vehicles on the road. Wherever an excavator has to pass over an asphalt area that is not to excavated, wooden mats or a granular surface is to be placed on the compacted asphalt first to protect the asphalt.

- With respect to disposal of excavated materials, all excavated non organic materials are to be loaded and hauled away. Only if some excavated non organic materials are found suitable for backfill above depths of required granular backfill (where native backfill materials are allowable) could such non organic materials be saved and reused as backfill as described by the specification.

- Excavated organic materials may be suitable for reuse by the adjacent landowner and in all lengths the contractor shall verify with the adjacent landowners what excavated peats are to be left for the landowners reuse. Where an owner wishes excavated peat left for his/her reuse, such shall be placed in windrows or piles on the field close to the area of excavation and adjacent to the new ditching but no closer than one metre to the bank of any new ditch.

- Any excavated organic soils that an adjacent owner does not want left on his fields are to be loaded, hauled away and disposed of like excavated non organic materials.

- In all cases, the disposal site of the materials is to be a site arranged by the contractor that satisfies any local or provincial requirements for use as a disposal site.

- With respect to bedding and backfill, 19mm dia. crushed new limestone is to be used for the 150mm (minimum) bedding and for backfill to the pipe in the trench and to a height of 150mm above the top of the pipe.

- Where peat depths are found to be lower than the 150mm bedding thickness additional excavation and depth of granular bedding is required, as previously set out herein.

- All limestone bedding and backfill is to be installed, tamped and compacted such that if compaction testing were done a 95% degree of compaction is obtained.

- Once the limestone backfill is brought to the top of the pipe, a length of filter fabric with a minimum width of 400mm is to be placed longitudinally and continuously on the top of the pipe prior to placing any of the stone backfill on top of the pipe. The geotextile that lines the walls of the excavation could be supplied in a greater width and then be used to also wrap over the pipe with a 400mm overlap in lieu of using a separate strip.

- Backfill above the required limestone bedding is as per specific pipe installation items.

- Work is to be done such that minimal damage to any road occurs where the road parallels the new pipe/culvert line.

- The road is to be videotaped prior to the start of work and again upon completion of work to note any damage that existed and that could have been caused by the work.

- Any equipment bringing pipe or materials are also to be mounted on rubber tires to minimize road damage.

- Should restoration of any paralleling asphalt road be ordered by the Engineer, payment will be made for the asphalt work on an approved time and materials basis, provided the Engineer is satisfied the contractor has attempted to take all precautions to minimize damage to the roads. Where the Engineer is not satisfied the contractor employed adequate means to protect the road, the responsibility for restoring the asphalt road will be that of the contractor.

- Trial trenches were excavated during the design period on a nearby project in similar soils and with similar new pipe/culvert required to verify that the pipe could be installed in the trenches as specified. The trial trenches were excavated one metre in width with vertical walls through the peat level. Filter fabric was used in one trench and was stapled to the wall (as a trial).

- The trenches excavated did exhibit some locations where old roots, small trunks and branches were encountered in the peat and these had to be separately removed and disposed of. Some cavities in the peat walls resulted from the root/branch removal and the backfill should attempt to fill in any of these holes in the trench wall where woody debris material is removed.

- The results of these trial trenches are included with the drawings for this RFT.

- Where any new pipe drain/culvert terminates in/commences from a length of open channel work, shot rock riprap with an acceptable/approved geotextile underlay is to be placed at each location. Other sections of this RFT set out the area of shot rock at various culverts. The work and payment for the shot rock is to be as per ***ISP 3.0***.

- Where any pipe drain culvert is to be joined to a new maintenance hole or catchbasin the pipe is to be inserted, cut to fit and grouted to the maintenance hole catchbasin as per industry practices.

- The following ***ISP's 1.03*** to ***1.16*** apply to specific lengths/types of pipe/culvert work on this project. Each of these ***ISP's*** are to be deemed to incorporate all the provisions of this ***ISP 1.01*** and ***1.02***.

.03 Specific and Additional Specifications for Pipe/Culvert Work Between Stations (Stns) 0+005 to 0+070 (Hillsview Road East Branch (HREB))

- Work at Stn 0+005 is to commence in dry.

- Central River is to have temporary earth cofferdam or equivalent constructed until work has proceeded sufficiently upstream to be above water level. Then all dam materials are to be removed and disposed of once pipe work has progressed beyond standing water elevations.

- Central River levels are maintained at lower elevations in the fall to spring and higher in summer conditions (variance is 216.30± to 216.55±).

- It is to be expected all materials excavated in this length will be hauled away.
- Outlet is to be just north of retaining wall that exists.

- Central River bank and bed is to be recessed as necessary at outlet to allow placement of approximately 25 square metres of shot rock riprap.

- A 100mm plastic tubing drain will be intercepted just upstream of the outlet and it is to be either joined to the new 750mm pipe using a tee section or is to be relaid (using new or existing materials) alongside the new pipe to outlet beside the new pipe (over a length of 7 to 10 metres).

- The top of trench in this length can be expected to be 5 to 6m wide.

- Backfill above the limestone backfill may be similar limestone (or materials that satisfy a Granular B Specification) to within 150mm of finished surface and then 150mm of Granular A is to be used.

- All granular above the pipe backfill to be compacted to 100% of the materials Standard Proctor Maximum Dry Density (SPMDD).

- The section of pipe outletting into the River is to have a free swinging rodent gate attached to it. A shop drawing for the rodent gate proposed to be used is to be submitted for approval by the Contract Administrator.

- If an adjacent landowner has materials sitting on the roadway that interfere with the work, the landowner will be asked to relocate such materials in advance. If the materials have to be moved by the contractor, additional payment as a Contract Change Order will be made.

- Traffic control is to be such that both landowners at the outlet have access to their yards during the work.

- This section of pipe will connect to the new 1500mm diameter maintenance hole.

.04 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+070 to 0+111 (HREB)

- The pipe is to be 750mm dia. in this interval.
- A portion of this length is to have identical work with identical specifications as for the pipe from 0+005 to 0+070 (***ISP 1.03*** above).
- The westerly portion of this length will however be below the shoulder of the road and then below a new field entrance to be constructed.
- Backfill above the pipe's backfill is to be identical to the backfill in interval 0+005 to 0+070 meaning that the limestone backfill or Granular B and then 150mm of Granular A is to be placed. Compaction of Granular A and B is to be 100% SPMDD.
- A minimum of 300mm of cover above the pipe in the entrance is to be provided.
- The work at Stn 0+111 is to allow for the placement of approximately 5 square metres of shot rock recessed into the banks and channel bottom.
- The usable width of the field entrance is to be 15m minimum.
- Some of the excavated organics in this interval may be desired by the adjacent landowner and if so, such are to be made available as described in this ISP.
- Otherwise, all materials are to be disposed of off site.
- Maximum gradient for any field entrance is to be 10% and if possible each entrance is to terminate in line with the north ditch bank or, at the furthest, at the edge of the one metre buffer strip.

.05 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+234 to 0+249 (HREB)

- 750mm dia. pipe to be used in this interval.
- All specifications re excavation, backfill materials, disposals, gradients and end treatment with riprap as set out for field entrance in interval 0+070 to 0+111 apply here.
- The usable farm entrance is to be 7m minimum for each of the two properties served.

.06 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+575 to 0+650 (HREB)

- 750mm dia. pipe to be used in this interval.
- The length of pipe from 0+575 to 0+590 is to be below a new field entrance and the specifications as written here for the other field entrances from 0+098 to 0+111 and 0+234 to 0+249 apply here re all work including the riprap, the backfill, the grading and the disposal.
- However, from 0+590 to 0+650± the pipe is to be considered as a drain enclosure below a residential lawn area.
- The top of the trench could be in the magnitude of 5m± wide within the lawn area.
- It is expected most materials will be hauled except for those that may be suitable for native backfill.

- The backfill above the pipe backfill may be clean non organic native soils to underside of topsoil. If clean non organic natives are not excavated, then imported clean non organic materials are to be hauled in. All compaction on the non organics is to be 95% SPMDD.

- The uppermost backfill is to be a 150mm thickness of clean native or imported topsoil satisfying this RFT's specifications re materials for, and installation of, topsoil.

- The topsoils are then to be hydroseeded as per this RFT's ISP.

- In this interval a roadside swale exists to the south of the new drain centerline and it is to be carried across the top of the pipe at the west part of the new field entrance so it can outlet to the north as it does now.

- The excavation work is to be done to minimize damage to trees that exist in this interval. Tree roots that are exposed by trench work will have to be cut if no other option exists.

- One road sign may have to be temporarily removed and replaced.

.07 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+650 to 0+673 (HREB)

- 750mm dia. pipe will be used in this interval.

- This length of pipe will be below the paved intersection of Hillsview Road and River Road.

- All excavation, disposal, bedding, backfill disposal is to be as per the specifications for the 750mm pipe from 0+005 to 0+070 below Hillsview Road with the exception that the work is to also allow for the placement of surface asphalt as per ***ISP 6.0*** of this RFT.

- The first lift of this asphalt is to be placed as soon as the backfill is acceptable in this area.

- If possible, a minimum of one lane of traffic is to be maintained along River Road but if the road has to be temporarily closed the provisions of ***GSP 72.0*** re road closures and detours are to be implemented.

- At Stn 0+673 the 750mm pipe is to be connected to a new 1500mm maintenance hole (MH2).

.08 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+673 to 0+679 (HREB)

- 600mm dia. pipe is to be used in this interval.

- It will continue from MH2.

- This section of pipe is expected to be below the shoulder area of River Road.

- All work re excavation, disposal, backfill will be similar to any pipe work where below a roadway requiring that limestone or Granular B be carried to within 150mm of the surface and then Granular A be used.

- At this location the end of the pipe is to be in the first section of the River Road North Branch and is to have shot rock riprap placed. The granular surface restoration of this 600mm pipe will thus have to blend to this riprap.

.09 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+000 to 0+432 (River Road South Branch – RRSB)

- 525mm pipe is to be used throughout on the River Road South Branch.
- The pipe is to start at the MH2 at 0+673 on the HREB and is to carry to the new maintenance hole MH7 at 0+432.
- The location of the 525mm pipe is to be below the west shoulder of River Road and is to be approximately midway between the overhead pole line that exists and the west edge of asphalt of River Road.
- The offsets are expected to be 1.7m± from the pole line and 2.0m± from the edge of asphalt so that neither the pole line nor the asphalt is disturbed.
- It is expected that the base of the peat stratum will vary from 0 to 300mm above the invert of the pipe, that a 1.2m wide trench to a depth of 1.0m in the peat and the underlying clayey silts and then with 1:1 slopes to the surface will be possible.
- The trench depth from ground surface to the invert (at centerline) is expected to be 1.7m to 1.8m±.
- Of the total length of 432m, approximately 155m is expected to be below granular driveway/parking areas and 105m is expected to be below grassed residential lawn areas.
- Pipe excavation to peat stratum base as a minimum, bedding, pipe backfill and disposal of excavated materials as described for all pipe in this ISP will apply.
- With respect to backfill along the pipe backfill, the limestone or Granular B materials are to be used to within 150mm of surface in all lengths (except where below residential lawns). The limestone or Granular B is then to be surfaced with 150mm of Granular A as described for most intervals along Hillsview Road (including at entrances).
- Where the 525mm pipe is below lawn areas, clean non organic native or imported soils are to be used above the limestone pipe backfill to within 150mm of the surface, once past the shoulder width, are to be compacted to 95% SPMDD and then the areas are to be topsoiled and hydroseeded as per ***ISP 7.0***. Generally the widths to be hydroseeded are to be equal to the existing adjacent widths.
- The full depth granular shoulder widths are to be equal to existing shoulder widths but no less than 1m wide. All trench backfill is to be granular to the surface except in green areas where the one (1) metre minimum width of gravel is to remain.
- Throughout in this interval an underground Bell line exists and it is to be pre-located and protected.
- Temporary overhead pole support, if necessary, is also to be provided.
- One lane of traffic is to be maintained along River Road South at all times.
- The pipe work will pass under three (3) 300mm dia. corrugated steel pipe culverts that are used for irrigation sleeves. These pipes are to be protected and/or reconstructed to match existing conditions if disturbed. The work is to be as per ***ISP 9.0***.
- If any roots of adjacent trees are exposed they are to cut flush to the trench wall.

.10 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+255 to 0+267 River Road North Branch (RRNB)

- This pipe length is to be 600mm diameter.
- Pipe is required in this interval both to protect an overhead hydro brace pole and to protect two concrete irrigation crocs.
- The pipe is to be placed and backfilled equivalent to other pipe work used for farm entrances as described in the Hillsview Road East Branch work.
- The pipe in this interval is not to be recessed by the 100mm below ditch bottom. However, additional excavation may be necessary for pipe bedding to commence at the base of the peat stratum.
- A guy wire support to the brace pole will have to be removed and reset. The pole may require temporary support. The guy wire will have to be reset to provide the required pole support.
- The two irrigation crocs will have to be protected from damage.
- One 250mm plastic pipe that is connected to one of the crocs will have to be removed in part with ends sealed as per ***ISP 10.0***.
- A 150mm dia. irrigation sleeve and the irrigation tubing that leads to it will have to be protected/reset as part of the work.
- The work is to provide a minimum of 300mm of cover to the new 600mm pipe.
- Work to also to be done to allow placement of shot rock riprap on 3 square metres of each end area.

.11 Specific and Additional Specifications for Pipe/Culvert Work at Stns 0+323, 0+410, and 0+478 (RRNB)

- At each of these 3 locations, a 6 metre length of 600mm pipe is to be placed to recognize the overhead hydro brace poles (with guys) that exist.
- The work is to be done as per the work where pipe is used at farm entrances as described elsewhere herein re all work including full compacted granular backfill.
- The pipes at each of these intervals are to be recessed by 100mm.
- The brace poles are to be protected and temporarily supported as necessary and the guys are to be removed and reset so as to provide support equal to that existing.
- Work to allow placement of shot rock riprap on 3 square metres of end area at each culvert end is required.

.12 Specific and Additional Specifications for Pipe/Culvert Work At Stn 0+695 (RRNB)

- A 9m length of 600mm pipe as a farm entrance culvert is required at this location in a location as show by drawings,
- An existing 450mm culvert is to be removed and disposed of. (If the landowner wishes it as salvage, it is to be left on the banks.)
- The new pipe work is to be subject to all provisions of pipe used at farm entrances including the full compacted granular backfills as described elsewhere herein.

- Work to allow placement of 3 square metres of shot rock riprap at each end is also required.

- 100mm recessing is also required.

.13 Specific and Additional Specifications for Pipe/Culvert Work Between Stns 0+695 to 0+727 (RRNB)

- In this interval a 32m length of 300mm pipe is to be placed in part as a catchbasin outlet and in part for future use as an outlet for a future driveway crossing.

- The new pipe will be in part below a farm entrance and in part below a residential lawn area.

- Where below the farm entrance, full granular backfill is required, while where below the lawn area, granular is to be used as pipe bedding and backfill and then clean non organic native or imported materials are to be used to the topsoil elevation.

- Restoration is to be with 150mm of topsoil and hydroseeding as per ***ISP 7.0***.

- At the catchbasin, part of the pipe will be below the riprap apron to the catchbasin.

- Tree roots, if encountered, are to be cut flush to the trench.

.14 Specific and Additional Specifications for Pipe/Culvert Work At Stn 0+712 (RRNB)

- At this location and out of the west wall of the new catchbasin, a 9m length of 150mm dia. tubing is to be placed to join up to a tubing at the well to the west that takes away artesian overflow waters.

- The surface restoration is to be as per the restoration for the adjacent 300mm pipe in the same lawn area (non organics, topsoil and hydroseeding)

- The existing well discharge tubing will have to be located and work to join it to the new 150mm tubing is to be part of this item. Also, a 100mm tubing that exists around the circumference of the well is also to be located and joined to this 150mm tubing as part of the work. Two 150 x 100 x 150 tees plus lengths of 100mm tubing are to be provided as part of this item to allow the work to be done.

.15 Specific and Additional Specifications for Pipe/Culvert Work at Stns 0+074, 0+177, 0+273 and 0+364 (RRSB)

- At each of these four locations 200mm dia. perforated plastic tubing supplied with a geotextile filter sock are to be placed as hickenbottom leads.

- Each of the four lengths is to be joined to a catchbasin on the main RRSB drain and at an invert elevation equal to the 525 pipe joined to the catchbasin.

- Excavation, bedding, backfill and disposal will be as per all lengths of closed drain to the top of the tubing. From the tops of this tubing to the surface, existing organic materials are to be used as backfill so that farming operations are not impacted.

- The new tubing are to be placed as close as possible to the edges of the cultivated areas so that disturbance to the tubing by field machinery is minimized.

- If the contractor elects to install these tubing lengths by a “drainage plow” method such will be acceptable in lieu of the normal open trench method.

- As part of the work to install each length of the tubing, a 200mm dia. hickenbottom is to be constructed at the top end of the tubing.

- The hickenbottom is to be kept to the perimeter of the worked field but, if at all possible, the low area of the field is to be graded to the hickenbottom.

- A cone of crushed stone is to be placed around each hickenbottom to act as support and a filter

- The hickenbottom is also to be wrapped with a geotextile.

- Each hickenbottom should rise to be 400 to 450mm above field level.

- Hickenbottoms to be used are to be approved with the Contract Administrator.

.16 Specific and Additional Specifications for Pipe/Culvert Work At Stn 0+000 Hillsview Road West Branch

- For this branch twin 50m lengths of 300mm tubing with 250mm hickenbottoms are to be placed

- All work is to be identical to that described for the hickenbottoms on the River Road South Branch (see 0.15 above).

- This branch is to be located adjacent to a field entrance in part. The final location and configuration of this short branch will have to be confirmed with the landowner at the time of construction due to the existence of the field entrance. It may be desirable to use a swale west of the entrance and keep the hickenbottoms at the edge of the entrance. If the drain is placed under the entrance, a change to 300mm dia. HDPE piping may be made for the east portion of the branch.

.17 Payment

- The unit price for any pipe drain/culvert work is to be payment in full for all labour, equipment and materials including the supply of the materials, the excavation, the disposal, the geotextile trench lining, the bedding, the backfill, utility location and support, connections to structures, excavation for riprap placement, traffic control and the restoration (excluding topsoil and hydroseeding and asphalt which are separate ISP's).

- Separate unit prices are to be provided for the work separately described in sections ***ISP 1.03*** to ***ISP 1.16*** and these unit prices are to provide for any and all work described to be both common and specific to these sections.

ISP 2.0 Open Drain/Channel Construction

.01 Scope

- This ISP applies to all open drain /channel construction on this project.

- This ISP contains specifications (common) that are applicable to all locations of channel construction and also contains sub-sections which set out further/specific specifications for specific locations of channel construction.

- Separate unit prices are required for each specific location of channel construction and payment will be made in accordance with the specific unit prices.

.02 Common Work

- All channel work is to be in the locations, to the elevations, and to the dimensions shown on the applicable drawings including the plans, the profiles and the cross-sections.

- The cross-sections (plus the plans) show the location of the channel centerline with respect to the road allowance limit.

- The sections also show how the new channel relates to any existing channel and to the roadway embankments.

- The Contractor shall in each location verify the centerline location with the Contract Administrator/Engineer prior to commencing work.

- With respect to any existing roadway signs, such shall be noted, removed and reset in existing locations whenever such work is necessary and as part of this tender item.

- All roadways and private property shall be videotaped prior to the work in any location so that a record of existing conditions is generated.

- With respect to traffic, the provisions of ***GSP 72.0*** shall apply and a minimum of one lane of traffic shall be maintained on the roadway paralleling any channel construction and with the appropriate traffic control provisions, i.e. signage, flagmen, etc.

- A traffic control plan shall be made available and be approved by the Contract Administrator for each section of channel work prior to commencement of work.

- Required access to properties and to fields shall be maintained during channel work as per ***GSP 72.0***.

- With respect to soils, it is expected that the native soils encountered by all channel work will be organic/peat. In some locations, excavation of roadside “fill” will be required to provide the required channel.

- Where excavation occurs in the native organics/peat, it can be expected some old tree remnants, i.e. roots, trunks, may be encountered. Such will have to be carefully cut/excavated out so as not to undermine adjacent areas and then be disposed of off site.

- With respect to ground water, all channel construction is to be done in the dry. This may require that the temporary cofferdam in the Central River required as part of culvert/pipe installation there may have to remain until channel work is higher than the Central River water levels.

- It is possible some temporary pumping of runoff waters may be necessary during channel construction to ensure work is in the dry.

- No areas of ground water seepage are anticipated.

- With respect to utilities, the location of any and all underground utilities shall be confirmed with OneCall prior to the work. Also each landowner adjacent to the work shall be contacted to verify locations of private waterlines, irrigation lines, hydro services and other private lines. The drawings show the location of known waterlines and irrigation lines. All private lines adjacent to and that could be impacted by the work are to be pre-located and protected as part of the work.

- Where reconstruction of any private lines are required, the specific ISP’s will apply or in some cases, Contract Change Order Work may be necessary. If exploratory holes should be required for any possible and unforeseen private or public utility line, the provisions of ***ISP 16.0*** will apply.

- At overhead pole locations, the poles shall be protected/supported as necessary and as per ***GSP 74.0***.

- With respect to the method of construction, it is required that excavation be done from roadside boulevards with minimal to no excavation being done from asphalt roads or from the adjacent fields.

- If it is found that it is desirable or necessary for an excavator to work along an asphalt roadway, either wooden mats or granular pads will be necessary, or the Contractor must provide for asphalt reconstruction, all as part of this ISP.

- The Contractor will be required to create a working path as necessary prior to start of excavation.

- With respect to disposal of materials, any excavated peats/organics shall be first offered to the adjacent landowner. If the adjacent landowner wishes such for his/her salvage, the materials shall be windrowed/piled adjacent to the one metre wide maintenance strip or into wagons if such are continuously supplied by the landowner.

- Any old tree roots or trunks that are excavated are to be hauled away regardless whether the landowner agrees to take the organics or not.

- Any excavated peats/organics that the adjacent owner does not require shall be loaded and hauled away by the Contractor as part of this ISP. Rubber tired vehicles travelling along the roadways may be used for hauling.

- It shall be the Contractor's sole responsibility to determine if a landowner will accept peats/organics or whether such are to be hauled away. There will be no adjustment for payment regardless of method of peat/organics disposal.

- The Contractor shall maintain any roadway that is used for hauling/disposal in a dust and mud-free condition. Dust control and mud removal shall be provided daily or as required by, and by a method approved by, the Contract Administrator.

- Dust and mud removal shall also be as per ***GSP 76.03*** and ***76.04***.

- During all excavation work, damage to adjacent field crops shall be minimized and reasonable access to fields as required by the landowner shall be provided.

- Damage to adjacent roads shall be minimized and the Contractor shall take all reasonable steps to ensure minimal damage results.

- When more than 20m of channel has been constructed, the required sediment control measures, i.e. straw bale dams or equivalent, shall be installed as per the specific ISP.

- The Contractor is to note that a one metre (1m) wide maintenance strip is required on the landowner side of new channel construction.

- This 1m strip is to be graded and made ready, as necessary, for hydroseeding.

- When any length (or groups of lengths) of channel work plus the adjacent maintenance strip is/are acceptable to the Contract Administrator/Engineer, such shall be made ready for and then hydroseeded as per ***ISP 7.0***.

- Channel banks are to be hydroseeded but bottoms do not require hydroseeding.

- Any roadway shoulder areas that are damaged by the channel work shall be graded and then surfaced with granular to match existing granular materials, depths and grading.

- With respect to tolerances for open channel construction, the following shall apply:

    - A variation of greater than 25mm above the design grade line may require re-excavation. Excavation below design grade up to 50mm is recommended so that sediment accumulation during or following excavation will not place the ditch bottom above the design grade at completion. Under some circumstances the Engineer may direct that over excavation greater than 75mm will have to be backfilled. No additional payment will be made if backfilling is required to remedy over excavation.

.03 Specific and Additional Specifications for Channel Work on Hillsview Road East Branch, Stn's. 0+111 to 0+234 and 0+249 to 0+575

- Two areas of sediment control (straw bales or silt fences) area required in this length of channel work and in accordance with ***ISP 15.0*** and ***GSP 72.0***.

- A private waterline will be crossed near Stn 0+285± and 0+475± and will be paralleled from Stn. 0+275± to 0+580±.

- The waterline will have to be protected/adjusted/reconstructed as per ***ISP 5.0*** where it is crossed.

- Where it is paralleled, the Contractor is to verify its location prior to work and then is to ensure it is not damaged. It is expected that the waterline will be sufficiently north of the new channel construction that it will not be intersected.

- As the cross-sections show, an existing shallow roadside channel with a small berm exists from Stn. 250 to 590. This channel drains westerly and then outlets to the north. Its purpose is to intercept road runoff. This channel shall be recognized and maintained until replaced by any new channel work.

.04 Specific and Additional Specifications for Channel Work on River Road North Branch, Stn's. 0+000 to 0+695 (Excluding Culvert Locations)

- Three areas of sediment control (straw bales or silt fences) are required in this length of channel work and in accordance with ***ISP 12.0***.

- It is believed that a private drainage tubing parallels the road allowance limits and should be sufficiently far into the field to be not damaged. However, the Contractor shall pre-locate this drainage tubing prior to start of work to ensure it will not be encountered. The Contractor shall also undertake the work to minimize any damage to it.

- As the cross-sections show:

    a) A shallow channel exists from Stn. 0+000 to 0+260± to intercept and carry road runoff waters to the existing pumping station at Stn. 0+260±, and

    b) A shallow channel exists from Stn. 0+400± north to Stn. 0+695± to intercept road runoff waters and carry such to a private ditch that runs westerly at Stn. 0+695.

- Both of these channels are to be recognized and maintained as necessary until replaced length by length by the new channel work.

- As the drawings also show, there is a vehicle parking area along the west side of River Road from Stn. 0+200± to 0+400±. This vehicle parking area is to be removed in order to allow the new channel construction. Specifically the roadside cross-section to be created is to provide for a roadside embankment slope of 2:1 from the new channel upwards with a new shoulder to match existing shoulder conditions to the north and south.

- In this area fill excavation and disposal will be required as part of this ISP.

- Where the granular road base is intercepted, a slope of 3:1 in the granular and then a 6% shoulder gradient minimum is to remain or be created.

- Should it be found at the time of construction that roadside slopes flatter than 2:1 are required for stability, additional excavation and disposal may be required. Any excavation and disposal in excess of that evident from the cross-sections will be measured and payment as per a Contract Change Order but with payment generally proportional to payment for excavation and disposal quantities elsewhere as evident from the cross-sections and tender prices.

- Any new roadside slope below the granular road bed shall be hydroseeded as part of other hydroseeding on this contract.

- As the plan drawings indicate, old concrete lamp poles (or equivalent) and other riprap have been used/placed for road embankment stability protection from Stn. 0+270± to 0+330±. These concrete poles and areas of riprap are to be removed and disposed of off site as part of the work of this ISP.

- Near Stn. 0+695, the existing channel curves northwesterly to an existing culvert (which is to be replaced as part of this pipe/culvert work on this project) and then the channel continues to the west.

- The new channel is to follow the existing channel's curvature to the location of the new replacement culvert. The existing channel to the west of the new replacement culvert is to remain as it is but joined to the new culvert where intercepted.

.05 Payment

- The unit price for any channel work is to be payment in full for all labour, equipment and materials including the supply of any needed materials, the excavation, the disposal, sign removal and replacement, utility location and protection/support, dust and mud control, excavation for riprap placement, traffic control and the restoration (excluding topsoil and hydroseeding and asphalt which are separate ISP's).

- Separate unit prices are to be provided for the work separately described in section ***2.03*** and ***2.04*** and these unit prices are to provide for any and all work described to be both common and specific to these sections.

ISP 3.0 Shot Rock Riprap

.01 General

- This Item applies to the supply and installation of shot rock for riprapping or surfacing, including excavation, shaping, grading and disposal of excavated material at locations required by drawings or as required by the Contract Administrator.

- Shot rock as aprons for the 900 x 1200mm catchbasins on the River Road South Branch will not be separately measured and paid and will be deemed to be part of the catchbasin item.

- This item applies to the shot rock riprap required at pipe/culvert ends, at the Petherick catchbasin apron, at the gutter outlet and at the Central River outlet.

.02 Work

- Work to be in accordance with OPSS 511 and in accordance with General Special Provision ***GSP 58.0*** re Shot Rock.

- All shot rock to be underlain by a filter fabric.

.03 Payment

- The actual amount of shot rock placed at locations specifically identified by this RFT, and/or where directed by the Contract Administrator, will be measured and will be paid at the applicable tendered cubic metre rate. There will be no difference in payment made for shot rock placed to a 300mm depth versus shot rock placed to a 500mm depth.

- The unit price per cubic metre bid will be full compensation for all labour, equipment and materials including preapproval of sources, hauling, preparation, filter fabric, placing and grading.

- Shot rock as aprons for the 900 x 1200mm catchbasins will not be separately measured and paid and will be deemed to be part of the catchbasin item.

ISP 4.0 Concrete Maintenance Holes

.01 General

- This Special Provision applies to the supply and installation of new storm maintenance holes (formerly called manholes), including excavation, bedding, backfill, compaction, connections, steps and lids/ covers.

- There are two maintenance holes required to date on this project as per the RFT.

.02 Work

- Work to be in accordance with OPSS 407 and OPSD 701.011, 701.012, 701.041, 701.051, 704.010, 1006.01 and 1006.02.

- All maintenance holes shall have watertight covers (OPSD 401.030).

- Bedding is to be 19mm crusher run limestone and shall be compacted to a minimum of 98% of the material's Standard Proctor Maximum Dry Density (SPMDD).

- Backfill for maintenance holes shall be the same crusher run limestone compacted to 98% SPMDD.

- Modular rings are permitted to adjust a maintenance hole if necessary to final grade. Turner rings are not permitted.

- Junctions of pipes to maintenance holes may be with approved flexible connectors but may also be grouted.

- Elevations shown for manhole tops are finished top of iron cover. Top of iron cover to be a minimum of 200mm and a maximum of 300mm above top of concrete manhole lid.

- Steps in accordance with OPSD 1351 (safety, aluminum grade) are to be included in each maintenance hole.

- Maintenance holes do not require benching.

- Maintenance holes shall have 0.3m to 0.6m sumps as shown on the drawings.

.03 Payment

- Measurement for payment shall be actual quantity and the unit of measurement is each.

- Payment at the Contract unit price shall be full compensation for all labour, equipment and material to do the work including layout, excavation, dewatering if necessary, compaction, disposal, bedding, backfill, connections, steps and lids.

ISP 5.0 Expose, Protect, Lower and/or Reconstruct 25mm Waterline

.01 General

- This Special Provision applies to the work necessary on the Hillsview Road East Branch where a private 25mm dia. plastic waterline will be crossed by the new channel construction in 2 locations.

- This item also applies if waterlines are encountered elsewhere.

- The waterline is known to be shallow and its approximate location and elevations are shown on the drawings.

- The specific type of plastic material used is not known.

.02 Work

- Each location shall be carefully exposed prior to the channel work at its location.

- The existing line is to be kept in service by using supports and protection as necessary during the work.

- Where sufficient slack in the line exists to allow it to be lowered below the new channel with the same extent of cover as existing, such will be the work to be done. Where such is done, the Engineer may require a 50mm thick slab of insulation below the ditch bottom and above the waterline as part of the work.

- Where the existing line can not be lowered to fit the new channel, it shall be reconstructed using similar materials and suitable couplings. Materials and couplings to be used must be pre-approved with the Contract Administrator.

- To allow new services to be constructed either use of the existing main must be suspended while the work is done or a temporary shut off valve must be placed in the existing service line until the new service line component is spliced in.

- All bedding, backfill and restoration is to be similar to ***ISP 1.0*** requirements for bedding, backfill and restoration.

- The new service shall have a minimum of 600mm of cover below the new channel bottom and a slab of 50mm thick Styrofoam insulation is to be placed above the line and below the channel.

- If a new service line is spliced in, the whole line shall be pressure tested and shall be then disinfected in accordance with industry practice.

- Prior to any work that would affect any landowner's use of the waterline, the affected landowners are to be given a minimum of 72 hours' notice that their water supply will be temporarily interrupted while the work is done.

.03 Payment

- Measurement for payment will be per each waterline crossing to be located, protected, altered and/or reconstructed.

- Similar payment will be made regardless whether new materials are required.

- The payment made will be compensation in full for all labour, equipment and materials including excavation, removals, disposals, materials, bedding, backfill, restoration, insulation, temporary valves or shut-offs, disinfection and pressure testing.

- This item is also to apply to any other small diameter waterline crossings that may be encountered.

ISP 6.0 Asphalt Restoration

.01 General

- This ISP pertains to the work to restore any asphalt roadway or driveway.

- This ISP includes the placement, grading and proof rolling of the Granular B subbase and the Granular A base to the satisfaction of the Contract Administrator prior to placement of hot mix asphalt, and then the supplying, placing, and compacting of HL8 or SP 19 base asphalt at specified thicknesses as shown on the Contract Drawings and as directed by the Contract Administrator.

- This ISP also includes the supplying, placing and compacting of HL3 or SP12.5 surface asphalt and specified thicknesses together with a tack coat prior to surface asphalt work as shown on the Contract Drawings and as directed by the Contract Administrator.

- This ISP also includes the supplying, placing and compacting the required granular subbase and base and both layers of hot mix asphalt for private entrance paving and any miscellaneous asphalt restoration requirements, at specified thicknesses as shown on the Contract Drawings and as directed by the Contract Administrator.

- The work will be paid on a square metre basis and is to include the necessary granular sub-base and base, adjacent shoulder work and the two lifts of asphalt.

- Any other work below an area of asphalt and its granular underlay placement is to be paid as part of another ISP.

- The two anticipated areas of asphalt restoration on this project are on Hillsview Road East Branch between Stations 0+650 and 0+673 at the River Road crossing, and in the River Road South Branch at a driveway at Stn 0+420±.

- However, this ISP will apply to any other area requiring asphalt restoration including measurement and payment.

.02 Work

- Work to be in accordance with OPSS's 310, 1001, 1003 and 1150.
- Asphalt cement shall be PGAC 58 28 as per OPSS 1101. No reclaimed concrete asphalt or reclaimed asphalt pavement (RAP) shall be used.
- All hot mix asphalt shall be placed by paving methods approved beforehand with the Contract Administrator.
- The Contractor will be required to review and have approved by the Contract Administrator all proposals for paving including timing, preparation, temperatures, placing and rolling.
- The asphalt is to be placed in two separate lifts with each lift being 50mm after compaction.
- The first lift is to be placed upon completion of pipe or culvert work and upon satisfactory compaction of the backfill to the pipe or culvert.
- This item of asphalt will involve the placement of the necessary granular base and subbase. (See ***GSP 26.0*** and ***27.0*** for Granular work.)
- On private laneways the granular base and subbase equivalent is to be a minimum of 250mm of Granular A or of such greater depth to match existing granular.
- On road crossings, the granular is to consist of a 300mm depth of Granular B and then a 150mm depth of Granular A. All granular is to be compacted to 98% standard proctor density. Then asphalt is to be placed.
- Mix designs are to be pre-submitted for the Engineer's approval six (6) weeks ahead of the work and the Engineer may retain the services of a geotechnical consultant to oversee the placement of the asphalt.
- At transition points from existing hot mix asphalt or surface treatment to new asphalt pavement, the existing asphalt or surface treatment is to be saw cut on an angle and the new asphalt is to be butted to the saw cut surface treatment.
- Step joints (3m in length) as per OPSS 310.07.11 are required and will be reviewed for approval by the Contract Administrator and/or the project's Geotechnical Soils Consultant.
- A tack coat is to be placed prior to the placement of the surface asphalt. (See ***GSP 68.0*** for Tack Coat.)
- If at the time of placement of the base asphalt, the Engineer, Town and Board agree that the surface asphalt may be placed at the same time, such may be allowed.
- However, the Contractor's tender is to provide for separate installation of the surface asphalt. The contractor is to be prepared not to place the surface asphalt until after one winter of consolidation.
- A Geotechnical Consultant may undertake compacting testing and thickness measurements of the base course asphalt on behalf of the Contract Administrator.
- Ramping is required at ends of base asphalt where later placement of surface asphalt occurs and is to be to the approval of the Contract Administrator.
- Residential owners are to be notified 72 hours ahead of the paving of their driveways.

.03 Payment

- The Unit Price Bid per square metre for asphalt work is to be payment in full for all labour, equipment and materials including verification that the subgrade is adequate, the supply, placement and compaction of granular base and sub-base, the supply, placement, compaction and rolling of asphalt in two separate lifts at two different times, supply and placement of tack coat, ramping, supply of mix design, and supply of any materials necessary for testing.

- Payment will be made at a 70% of the tendered rate upon completion of the base asphalt and such is expected to be made at the end of the initial construction period. The balance of 30% of the unit price bid will be paid upon completion of the surface asphalt and such could/may not be until the following construction season.

- If however, as stated above in this section, the Engineer, with the approval of the Municipality and Board, allows both lifts to be placed in the same construction season, 100% payment will be made upon completion of the asphalt.

ISP 7.0 Hydraulic Seeding and Mulching

.01 General

- This Special Provision applies to the supply and application of hydraulic seeding and mulch on new channel banks, on the one metre wide maintenance strips, on existing green boulevard and lawn areas and other green areas requiring restoration as shown by the drawings, and elsewhere as may be directed by the Contract Administrator.

- Any existing green areas where hydroseeded are also to be topsoiled prior to the hydroseeding and as part of this ISP. Topsoil is not required where banks or surfaces in native peat soils are to be hydroseeded.

- Where existing green areas are to be restored with topsoil and hydroseeding, the topsoil work is to be included in this ISP. The topsoil is to be a minimum of 150mm thick after preparation for seeding and is to be as per ***GSP 71.0***.

- Existing topsoils, where approved by the Contract Administrator, may be stripped and re-used for purposes of this ISP. Imported topsoils in accordance with ***GSP 71.0*** are to be supplied and used where existing topsoils are not approved or sufficient for reuse.

.02 Work

- The work shall be in accordance with OPSS 804.

- The seed for all channel work is to be primarily a low grow/Dutch clover with other components recommended by the supplier. The seed in existing green areas is to be a residential seed mixture. Hydraulic mulch shall be used in accordance with OPSS 804.

- Each seed mixture is to be supplied by a firm familiar with seeding mixtures used in the Holland Marsh and pre-approval of the mixture is to be by the Engineer.

- The Contractor shall not carry out the work under adverse weather conditions such as high wind, frozen ground, or ground covered with snow, ice or standing water. Preferred time is May 1 to October 31.

.03 Payment

- The areas hydraulically seeded and mulched in accordance with the drawings and/or as directed by the Contract Administrator, shall be measured for payment in square metres following the contour of the ground.

- Hydraulic seeding and mulching conducted outside the authorized limits will be measured and deducted from the total quantity measured prior to payment.

- Payment will be made at the Contract unit price and such payment shall be compensation in full for all labour, equipment and materials required to do the work, including supply, placement and grading of topsoils in areas of existing lawn/grassed conditions.

ISP 8.0 Concrete Catchbasins

.01 General

- This Special Provision applies to the supply and installation of new catchbasins including excavation, bedding, backfill, compaction, connections, grates and fitting to swales.

- Five 900 x 1200mm catchbasins and one 600 x 600mm catchbasin are required on this project as per this RFT package.

- However, this ISP will apply to any additional and similar catchbasins required.

- Separate measurement and payment will be made for the 900 x 1200mm catchbasins and the 600 x 600mm catchbasin.

.02 Work

- Work for catchbasins is to be as per OPSS 407 and OPSD 705.010 and OPSD 705.030 or as per the standards shown on the drawing.

- Birdcage grates in accordance with the standards shown on Drawing 34 are required on all catchbasins. All are to be fastened/secured to the catchbasin with non-corrosive bolts.

- Bedding is to be 19mm crusher run limestone or approved equal and shall be compacted to a minimum of 98% of the material's Standard Proctor Maximum Dry Density (SPMDD).

- Backfill for catchbasins shall be 19mm crusher run limestone or approved equal compacted to 98% SPMDD.

- Elevations shown for flat top catchbasins are finished top of concrete wall.

- Catchbasins shall have 0.30m (300mm) sumps.

- Birdcage grates to be a maximum height of 150mm, and a minimum of 75mm. Heights are to be approved with the Contract Administrator in advance of ordering.

- Shot rock (as per ***GSP 58.0***) is to be placed to a 300mm thickness and to a 300mm minimum width (2± square metres of area) as an apron to each 900 x 1200mm catchbasin. Shot rock is to be underlain by a filter fabric.

- Shot rock at the 600 x 600mm catchbasin will be measured and paid as part of the gutter outlet shot rock.

- All catchbasins shall have minimum inside dimensions matching the dimensions shown on the Drawings. Contractor is responsible for ordering catchbasins to match the inlet and outlet connections and top elevations required by the Special Provisions and the Drawings.

- Precast 900 x 1200mm concrete catchbasins shall be manufactured by Coldstream Concrete (Parkhill) or approved equal. Minimum wall thickness for catchbasins without reinforcement is 150mm and with reinforcement 100mm. The joints between precast catchbasin sections shall be protected with geotextile to prevent soil material from entering into the catchbasin. Joint protection using mortar or water tight barrier is also acceptable. Grates are to be birdcage grates as manufactured by Coldstream Concrete or approved equal unless specified otherwise on the Drawings. All grates to be secured with corrosion resistant hardware.

- Marker stakes as supplied by Coldstream Concrete or equal are to be placed beside each catchbasin unless specified otherwise on the Drawings.

- All tile or pipe connected to concrete catchbasins shall be mortared or secured in place so that no gaps remain at the connection. Mortar is to be applied on both the inside and outside wall surfaces.

- The Contractor shall be responsible for backfilling all settlement areas around catchbasins during the contract warranty period. No additional payment will be provided for adding backfill to settlement areas around catchbasins.

- All catchbasin sumps to be fully cleaned by the Contractor after completion of drain installation and backfilling.

.03 Payment

- Measurement for payment shall be actual quantity and the unit of measurement of each.

- Payment at the Contract unit price for catchbasins shall be full compensation for all labour, equipment and material to do the work including layout, excavation, dewatering if necessary, compaction, disposal, bedding, backfill, connections, grates, and shot rock aprons (at the 900 x 1200mm catchbasins).

ISP 9.0 Work at Irrigation Culverts

.01 General

- This Special Provision pertains to the work on the River Road South Branch to install the closed drain below three separate 300mm dia. culverts used as irrigation line sleeves.

- These culverts are used at times of irrigation to allow the irrigation lines to pass below the road and connect to the header irrigation line on the opposite side of the road.

.02 Work

- The work will be to locate, protect and/or support each culvert as the drain trench encroaches on it.

- The culverts may be removed and reset if desired but the work must be carefully done since deflections in grade or alignment would prevent the threading of the irrigation pipe through it.

- New drain backfill must be carefully placed and compacted to provide acceptable bedding for the culverts and to prevent settlement of the culverts after work is completed.

- Restoration above the culvert is to equal existing restoration.

.03 Payment

- Measurement for payment shall be actual quantity of irrigation culverts traversed and the unit of measurement is each.

- Payment at the Contract unit price for work at irrigation culverts shall be full compensation for all labour, equipment and materials to do the work including locating, excavation, support, removal and resetting if necessary, bedding, backfill and restoration.

ISP 10.0 Sealing of Existing 250mm Line

.01 General

- This Special Provision pertains to the work on the River Road North Branch at Stn 262± where an existing 250mm dia. plastic road crossing will be intercepted by a length of new 600mm dia. culvert.

- It is believed this line was used for the original outlet for a pumped drainage system but it has been abandoned.

- It is connected to one of the irrigation crocs at its west end but its east end was not found and is believed to have been sealed.

- The elevation of this line is such that its invert is close to the elevation of the new drain pipe

.02 Work

- The Contractor is to carefully locate and expose this line.

- Following such exposure, work is to be done to remove the portion within the trench and to seal its ends with concrete on either side of the new trench.

- The concrete and method of placement is to be approved beforehand with the Contract Administrator.

- All bedding backfill at this line is to be as per the bedding backfill for any other pipe on this project.

- ***ISP 15.0*** applies here with respect to the sealing work. However, this particular sealing is to be paid as per this ***ISP 10.0*** and not as per ***ISP 15.0***.

.03 Payment

- The lump sum bid for work at this 250mm plastic pipe is to be full compensation for all labour, equipment and materials to do the work including locating, excavation, cutting, removal, disposal, concrete, and sealing work.

ISP 11.0 Asphalt Curb and Gutter

.01 General

- This Special Provision applies to the supply and placement of asphalt curb and gutter, including a termination length and a gutter outlet in the southwest quadrant of the Canal Road

and River Road intersection, as shown on the Contract Drawings and/or as directed by the Contract Administrator.

.02 Work

- Contractor to provide an asphalt mix design 10 days prior to placement of curbs for review and acceptance by the Contract Administrator.
- Contractor to prepare granular base for review by the Contract Administrator prior to placement of curbs.
- Excavation for the curb and gutter and granular base shall be placed and graded to construct a small berm on the outside of the curb and gutter as shown by the cross-sections.
- The berm shall be topsoiled and hydroseeded as per ***ISP 7.0*** with separate payment as per this item.
- Contractor to review curb layout with Contract Administrator prior to placing of asphalt.
- All curb and gutter is to be protected from damage from heavy equipment and vehicles.
- Work to be in accordance with OPSS 353, 904 and 1350, OPSD 601.010 and OPSD 605.020. (OPSD 600.030 would apply if a mountable concrete curb and gutter was approved.)
- Testing and inspection to be also in accordance with ***GSP 30.0*** and ***52.0*** and may in part be by the Owner's Geotechnical Consultant.
- The existing asphalt roadway is to be protected from damage during the new curb and gutter work.
- Any damage to the asphalt is to be corrected as part of the unit price bid for this item.
- In the interval between Stn 0+790 and 0+804, the curb and gutter will have minimal to no grade as it fits the existing asphalt edge. The gutter itself may have to be more than 50mm below the edge of pavement in a short portion.
- A gutter outlet is to be included at Stn. 0+712± as part of the curb and gutter work.
- Should the Contractor and the Contract Administrator agree that a concrete curb and gutter can be substituted, work shall be done in accordance with OPSD 600.030 and OPSS 353, 904 and 1350 with 30 MPa concrete.

.03 Payment

- Measurement for payment shall be actual quantity including the termination length and the gutter outlet, and the unit of measurement is metres.
- Payment at the Contract unit price shall be full compensation for all labour, equipment and material to do the work including excavation, disposal, granular base, gutter outlet, berm work, asphalt road protection, testing and restoration.

ISP 12.0 Straw Bale Dams

.01 General

- This Item Special Provision applies to straw bale dams installed in areas of swale work as shown by the drawings or as required by the Contract Administrator.

.02 Work

- The work is to be in accordance with OPSD 219.180 and OPSS 805.
- Where the drawings do not show the locations for the straw bale dams, the locations for such will be provided at the time of the pre-construction site meeting.

.03 Payment

- Measurement for payment shall be the actual quantity of each straw bale sediment dam.
- The unit price bid for each straw bale dam will be payment in full for all labour, equipment and materials for any dam up to a six (6) metre width.
- Should any dam be required with a width greater than 6 metres a proportional increase in payment will be made based on the factor of installed width divided by 6 metres.

ISP 13.0 19mm Crusher Stone - Provisional Item

.01 General

- This Provisional Item applies to the supply, placement, fine grading and compacting 19mm crusher run stone to 100% of the material's Standard Proctor Maximum Dry Density (SPMDD) for use in areas not required by an ISP and as directed by the Contract Administrator.
- Stone type may include limestone. (Limestone is preferred.)

.02 Work

- This is a provisional item and estimated quantities are provided for bidding purposes only.
- Work to be in accordance with OPSS 314 and OPSS 1004 and as per any applicable GSP.
- 19mm crusher run stone that becomes contaminated due to Contractor activity shall be removed and replaced at no cost to the Contract.
- Water required for compaction is to be supplied and applied as necessary and as part of this Provisional Item.

.03 Payment

- Measurement for payment shall be actual quantity approved/directed (by weigh tickets) and the unit of measurement is tonnes.
- Payment at the Contract unit price shall be full compensation for all labour, equipment and material to do the work.
- 19mm crusher run stone that is used as granular at locations where granular is required as part of a specific contract item will not be measured and paid as part of this Provisional Item.

ISP 14.0 Rigid Styrofoam Insulation - Provisional Item

.01 General

- This Provisional Item Special Provision applies to the supply and installation of Rigid Styrofoam Insulation where required and as directed by the Contract Administrator.
- Rigid Styrofoam Insulation may be required in areas of catchbasins, pipes and/or culverts were earth cover may be minimal and where there are concerns of clearance between pipes and utilities or freeze up.
- OPSS 316 is applicable.

.02 Work

- The Contractor will be required to submit a sample of the insulation proposed and the supplier's brochure to described specifications, materials and installation details at a minimum time of two weeks before the installation is required.
- Bedding, backfill, jointing proposals are also to be submitted beforehand for prior approval.
- Where the insulation is to be in the form of a box, cornering and overlap details will be necessary.
- Where pipes or culverts must pass through the insulation, details of cutting to provide tight fit must be submitted.

.03 Payment

- Payment will be at the unit price bid per square metre of insulation and in the areas approved/directed for installation by the Contract Administrator.
- Payment will be compensation in full for all labour, equipment and materials including pre-approvals, cutting, forming, bedding and backfill.

ISP 15.0 Sealing of Irrigation, Drain, Conduit and/or Well Lines – Provisional Item

.01 General

- This Provisional Item Special Provision applies to the work that may be necessary to seal an abandoned existing irrigation, a drain, a conduit or a well line as cap work and/or to prevent backflow of waters in flood conditions, if and as directed by the Contract Administrator.
- In the Holland Marsh area most irrigation, drain, conduit and well lines are from 150mm to 250mm in diameter or smaller.
- The existing line materials may be steel, iron, and smooth wall or corrugated plastic.

.02 Work

- The work, if and where required, will be to grout with a low slump concrete mix, or approved equal, a three (3) metre length of the line.
- This Item Special Provision applies to any diameter of a line up to 250mm in diameter.
- The Contractor's methods to supply and insert the seal into the line must be pre-approved with the Contract Administrator.

.03 Payment

- The unit price bid for each section of sealing will be payment in full for all labour, equipment and materials to seal an existing line of any material and up to a 250mm diameter.

- If any larger lines are found and are to be sealed, separate and approved payment will be made but consistent with the bid prices for this item.

ISP 16.0 Exploratory Holes – Provisional Item

.01 General

- This Provisional Item Special Provision applies to the work that may be required by the Contract Administrator to excavate in areas of proposing work to determine depths and thicknesses of peat and/or to determine subgrade conditions and/or to determine existing roadway construction and/or to locate other underground utilities (excluding the work of ***ISP 5.0***.)

.02 Work

- The work will be to excavate a narrow width and length of roadway shouldering/boulevards in locations indicated by the Engineer to minimize disturbance to both the existing roadway and the new roadway.

- The work may be done by water excavation methods (daylighting) where approved by the Contract Administration.

- Widths and trench slopes of the excavation are to be approved beforehand with the Engineer.

- The Engineer will indicate the timing of such excavation so that the excavation may be viewed also by the Geotechnical Consultant.

- All provisions of this contract with respect to utility locations, traffic control, dust and mud control, trench stabilization, backfill, and restoration will apply to the excavation of exploratory holes.

- Different materials from the hole excavation are to be separately piled and thus replaced with compaction efforts to duplicate existing conditions.

- Restoration to match existing conditions is required at all exploratory holes.

.03 Payment

- Measurement for payment will be per exploratory hole excavated and for any depth of excavation up to 3 metres.

- The provisional unit price tendered per exploratory hole will be full compensation for all labour, equipment and materials including utility locates, traffic control, mud and dust control, separation of materials, backfill, compaction as required and restoration.

ISP 17.0 Granular A – Provisional Item

.01 General

- This Provisional Item Special Provision applies to the supply and placement of Granular A where required and as directed by the Contract Administrator.
- Granular A may be required pursuant to this Item for new shoulder material or at apron areas.
- General Special Provision ***GSP 26.0*** is applicable.

.02 Work

- This is a provisional item and estimated quantities are supplied for bidding purposes.
- Where Granular A is required as shouldering material or as apron area, the granular is to be placed to the length, width and depth as specified by the Engineer.
- Grading and compaction is required as per the ***GSP 26.0***.
- If any existing materials are to be loaded and hauled away or otherwise disposed of, such work shall be deemed to be part of this Provisional Item.
- The work will be to excavate a narrow width and length of roadway shouldering/boulevards in locations indicated by the Engineer to minimize disturbance to both the existing roadway and the new roadway.

.03 Payment

- Measurement for payment shall be actual quantity approved/directed (by weigh tickets) and the unit of measurement is tonnes.
- Payment at the provisional unit price shall be full compensation for all labour, equipment and material to do the work.

ISP 18.0 Silt Fences – Provisional Item

.01 General

- This Provisional Item Special Provision applies to the supply, installation, inspection, maintenance and removal of temporary silt fences to prevent the migration of sediment onto private property, if directed by the Contract Administrator.
- Siltation Controls shall conform to the requirements outlined in General Special Provision ***GSP 20.0*** re Environmental Obligations.

.02 Work

- The work shall be in accordance with OPSS 805 and OPSD 219.110.
- No work shall be carried out beyond the limits directed by the Contract Administrator.
- Silt fences may have to be erected prior to any other work and be removed after restoration and ground cover is established.
- The Contractor shall inspect any installation weekly and following each rainfall event and provide a written inspection and maintenance report. Any repairs/reconstruction necessary shall be attended to as part of the unit price bid.

.03 Payment

- Measurement for payment will be made in linear metres of the silt fence authorized/required by the Contract Administrator.

- Silt fence constructed outside the authorized limits will be measured and deducted from the total quantity measured prior to payment.

- Payment will be made at the Contract Provisional unit price and shall constitute full compensation for all labour, equipment and materials.

STANDARD KSAL SPECIFICATIONS

(APPLICABLE WHERE NOT SUPERSEDED BY APPENDIX E SPECIFICATIONS)

200 GENERAL CONDITIONS

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200 GENERAL CONDITIONS

200.1 SCOPE

The work to be done under this contract consists of supplying all labour, equipment and materials to construct the drainage work as outlined in the Instructions to Tenderers, the Form of Tender and Agreement, the Schedule of Tender Prices, the Drawings, the General Conditions, Special Provisions and the Standard Specifications.

200.2 ORDER OF PRECEDENCE

In case of any inconsistency or conflict between the drawings and specifications, the following order of precedence shall apply: Addenda, Form of Tender and Agreement, Schedule of Tender Prices, Special Provisions, Contract Drawings, Standard Specifications, General Conditions.

200.3 MUNICIPALITY

Municipality refers to a municipal corporation in the Province of Ontario. Where reference to Township, County, Region, Town, City or Owner appears it shall be deemed to be the same as the word Municipality. Where reference to owner appears in the specifications it is usually in reference to the owner of the property on which the drain is being constructed.

200.4 TENDERS

Tenders are to be submitted on a lump sum basis for the complete works or a portion thereof, as instructed by the Municipality. The Schedule of Tender Prices must be completed and submitted with the Form of Tender and Agreement even though the Contract will be a lump sum. As outlined in the Instructions to Tenders a deposit in the form of a certified cheque, bank draft, bonding or irrevocable letter of credit must accompany each tender as a guarantee of good faith. The deposit shall name the Municipality as the payee. All deposits, except that of the Tenderer to whom the work is awarded, will be returned within 10 days of the time the contract is awarded. The certified cheque of the Tenderer awarded the work will be retained as Contract Security and returned with the Completion Certificate for the work. A Performance Bond may also be required to ensure maintenance of the work for a period of one year after the date of the Completion Certificate.

200.5 EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Prior to the submission of the Tender, the Tenderer must examine the premises and site to compare them with the Drawings and Specifications in order to be satisfied with the existing conditions and the extent of the work to be done. The Tenderer must ensure that the meaning and intent of the drawings, estimated quantities and specifications is clearly understood before submission of the Tender. No allowances shall be made on behalf of the Contractor by reason of any error made in the preparation of the tender submission.

Any estimates of quantities shown or indicated on the drawings or elsewhere in the tender document are provided for the convenience of the Tenderer. The Tenderer should check the estimate of quantities for accuracy. Any use made of the estimated quantities by the Tenderer in calculating the tendered amounts is done at the Tenderers risk.

200.6 COMMENCEMENT AND COMPLETION OF WORK

The work must commence immediately after the Tenderer is notified of the contract award or at a later date, if set out as a condition in the Form of Tender and Agreement. If weather and ground conditions are unsuitable, work may be started at a later date from either of the above two dates if such delay is approved by the Engineer. The Contractor shall provide a minimum of 48 hours advance notice to the Engineer and the Municipality before commencement of any work. The work must proceed in such manner as to ensure its completion at the earliest possible date consistent with first class workmanship and within the time limit set out in the tender/contract document. Failure to commence or complete the work as set out in the tender/contract document may result in a forfeiture of all or part of the Contract Security if the Engineer deems that damages have been sustained to the Municipality or to any landowner because of the non-commencement or non-completion of the contract as awarded and that the failure to meet the specified dates has been the fault of the Contractor.

200.7 NOTICES RE COMMENCEMENT OF WORK

If the Contractor leaves the job site for a period of time after initiation of work, a minimum of 48 hours advance notice shall be given to the Engineer and the Municipality before commencement of any further work. If any work is commenced without the advance notice the Contractor shall be fully responsible for all such work undertaken prior to such notification and shall make good any works or materials judged to be inadequate or constructed in any manner that may have been subject to alteration if made known to the Engineer prior to commencement of construction.

200.8 PERMITS, NOTICES, LAWS AND RULES

The Contractor shall apply and pay for all necessary permits or licenses required for the execution of the work. This shall not include the obtaining of permanent easements or rights or servitude. The Contractor shall give all necessary notices and pay all fees required by the law and comply with all laws, ordinances, rules and regulations relating to the work and to the preservation of the public's health and safety and if the specifications and drawings are at variance therewith, any resulting additional expense incurred by the Contractor shall constitute an addition to the contract price.

200.9 HEALTH AND SAFETY

Contractor must comply with the Occupational Health and Safety Act (OHSA) and the associated Regulations for Construction Projects. Contractor will also follow any site-specific safety and training requirements of the Municipality, agencies, utility companies or other authorities.

Communication about site-specific hazards and safety requirements shall occur at the pre-construction meeting. If no pre-construction meeting is conducted, Contractor will communicate site-specific hazards and safety requirements before beginning work.

Contractor shall immediately report any workplace incidents, near misses, injuries and occupational illnesses to the Engineer.

200.10 LIMITATIONS OF OPERATIONS

Except for such work as may be required by the Engineer to maintain the works in a safe and satisfactory condition, the Contractor shall not carry out operations under the contract on Sundays or Statutory Holidays without permission in writing from the Engineer. The Engineer may direct in writing to the Contractor to cease or limit operations under the contract on any day or days if the operations are of such a nature, or if the work is so located, or if the traffic is of such a volume, that the Engineer deems it necessary or expedient to do so.

200.11 SUPERVISION

The Contractor shall provide constant supervision of the construction work and shall keep a competent foreman in charge at the site.

200.12 CHARACTER AND EMPLOYMENT OF WORKERS

The Contractor shall employ only orderly, competent and skillful workers to do the work and shall give preference to available qualified residents in the area of the contract. Whenever the Engineer informs the Contractor in writing that any workers are, in the opinion of the Engineer, disorderly, incompetent, or breaking the law, such workers shall be discharged from the job site and shall not again be employed on the job site without the written consent of the Engineer.

200.13 SUB-CONTRACTORS

If the Municipality so directs, the Contractor shall not sublet the whole or any part of this contract without the approval of the Engineer.

200.14 PAYMENT

Progress payments in cash equal to about 90% of the value of the work done and materials incorporated in the work will be made to the Contractor monthly. If directed by the Engineer the Contractor may be required to provide a written request for the progress payment amount. An additional 7% will be paid 45 days after the date of the Completion Certificate by the Engineer and 3% of the contract price may be reserved by the Municipality as a maintenance holdback for one year from the date of the Completion Certificate.

The holdbacks noted above may be increased by the Municipality if, in the written opinion of the Engineer, particular conditions of the contract require such greater holdback.

After the completion of the work any part of maintenance holdback may be used to correct defects from faulty construction and/or materials provided that notice shall first be given by the Engineer in writing to the Contractor stating that the Contractor has seven (7) days in which to remedy the defect in construction and/or materials.

200.15 TERMINATION OF CONTRACT BY THE MUNICIPALITY

Termination of the contract by the Municipality may be considered if the Contractor:

1. should be adjudged bankrupt or make a general assignment for the benefit of creditors or if a receiver should be appointed on account of insolvency;
2. should refuse or fail to supply enough properly skilled workmen or proper materials after having received seven (7) days' notice in writing from the Engineer to supply such additional workmen or materials in order to commence or complete the works;
3. should fail to make prompt payment to sub-contractors or for materials or labour;
4. should persistently disregard laws, ordinances, or instructions from the Engineer, or otherwise be guilty of a substantial violation of the provisions of the contract;

then the Municipality, upon Certificate of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy, give written notice to the Contractor to terminate the employment of the Contractor and take possession of the premises, and of all materials, tools and appliances thereon, and may finish the work by whatever method the Municipality may deem expedient, but without undue delay or expense. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price will exceed the expense of finishing the work including compensation to the Engineer for additional

services and including other damages of every name and nature, such excess shall be paid to the Contractor. If such expense will exceed such unpaid balance including the Contract Security, the Contractor shall pay the difference to the Municipality. The expense incurred by the Municipality, as herein provided, shall be certified by the Engineer. If the contract is terminated by the Municipality due to the Contractor's failure to properly commence the works, the Contractor shall forfeit the Contract Security and furthermore shall pay to the Municipality an amount to cover the increased costs, if any, associated with a new tender for the contract being terminated.

If any unpaid balance and the Contract Security do not equal the monies owed by the Contractor upon the termination of the contract, the Municipality may also charge such expenses against any money which is or may thereafter be due to the Contractor from the Municipality.

200.16 LIQUIDATED DAMAGES

It is agreed by the parties to the Contract that in case all the work called for under the Contract is not finished or complete within the period of time as set forth in the Tender/Contract Document, damage will be sustained by the Municipality. It is understood by the parties that it will be impracticable and extremely difficult to ascertain and determine the actual damage which the Municipality will sustain in the event of and by reason of such delay. The parties hereto agree that the Contractor will pay to the Municipality a sum as set out in the Form of Tender and Agreement for liquidated damages for each and every calendar day delay, including Saturdays, Sundays and Statutory Holidays, in finishing the work in excess of the number of working days prescribed. It is agreed that the liquidated damages amount is an estimate of the actual damage to the Municipality which will accrue during the period in excess of the prescribed number of working days.

The Municipality may deduct any amount due under this section from any monies that may be due or payable to the Contractor on any account whatsoever. The liquidated damages payable under this section are in addition to and without prejudice to any other remedy, action or other alternative that may be available to the Municipality.

The Contractor shall not be assessed with liquidated damages for any delay caused by acts of nature, or of the Public Enemy, Acts of the Province or of any Foreign State, Fire, Flood, Epidemics, Quarantine Restrictions, Embargoes or any delays of Sub-Contractors due to such causes.

If the time available for the completion of the work is increased or decreased by reason of alterations or changes made under the provisions of the Contract, the number of working days shall be increased or decreased as determined by the Engineer.

If the Form of Tender and Agreement does not show an amount for Liquidated Damages then Liquidated Damages do not apply for this contract.

200.17 CONTRACTOR'S LIABILITY

The Contractor and all workers, agents or any party under the Contractor's control, including Sub-Contractors, shall use due care that no person or property is injured and that no rights are infringed during the construction work outlined in the contract. The Contractor shall be solely responsible for all damages by whomsoever claimable in respect of any injury to persons or to lands, buildings, structures, fences, livestock, trees, crops, roadways, ditches, drains and watercourses, whether natural or artificial, or property of whatever description and in respect of any infringement of any right, privilege or easement wherever occasioned in the carrying on of the work or any part thereof, or by any neglect, misfeasance or non-feasance on the Contractor's part or on the part of any workers, agents or parties under the Contractor's control including Sub-Contractors, and shall bear the full cost thereof. The Contractor shall be fully responsible to make such temporary provisions as may be necessary to ensure the avoidance of any such damage, injury or infringement and to prevent the interruption of or danger or menace to the traffic in any railway or any public or private road entrance or sidewalk and to secure to all persons and corporations the uninterrupted enjoyment of all their

rights, in and during the performance of the work. The Contractor shall indemnify and save harmless the Municipality and the Engineer from and against all claims, demands, losses, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon, occasioned by, or attributed to any such damage, injury or infringement.

Wherever any work is of such an extent and nature that it must necessarily be confined to particular areas of a roadway, a working area, or private property, the Contractor shall use reasonable care not to damage or deface the remaining portions of the property, and if any damage is occasioned as a result of the Contractor's operations, it shall be rectified by and at the expense of the Contractor, to the satisfaction of the Engineer. Notwithstanding the indemnity provisions contained in this section, where in the opinion of the Engineer the Contractor has failed to rectify any damage, injury or infringement or has failed to adequately compensate any person for any damage, injury or infringement for which the Contractor is responsible under the contract, the Engineer, following notice in writing to the Contractor of an intention so to do, may withhold payment of any monies due the Contractor under this or any other contract until the Contractor has rectified such damage, injury or infringement or has paid adequate compensation for such damage, injury or infringement, provided however, that the Municipality will not withhold such monies where in the opinion of the Engineer there are reasonable grounds upon which the Contractor denies liability for such damage, injury or infringement and the Contractor has given the claimant a reasonable time in which to establish the validity of the claim, and provided further that the amount withheld under this section shall not exceed the amount of such claims against the Contractor.

Where the Contractor uses privately owned lands for pits or waste disposal areas, the Contractor shall comply with applicable laws and provide the Engineer with a release signed by or on behalf of the owner of each pit or waste disposal area used by the Contractor. If the said release is not obtained, then sufficient monies will be withheld from the Contractor except, however, where the owner's signature is withheld solely on the basis of damage, injury, or infringement it will be dealt with as provided elsewhere in this subsection.

Nothing herein contained shall be construed as in any way restricting or limiting the liability of the Contractor under the laws of the country, province or locality in which the work is being done. Neither the Completion Certificate nor final payment thereunder, nor any provision in the Contract Document shall relieve the Contractor from this liability.

200.18 LIABILITY INSURANCE

The Contractor shall take out and keep in force until the date of acceptance of the entire work by the Engineer, a comprehensive policy of public liability and property damage insurance providing insurance coverage of at least $3,000,000 for each and every accident, exclusive of interest and cost, against loss or damage resulting from bodily injury to or death of one or more persons and loss of or damage to property and such policy shall where, and as requested by the Municipality, name the Municipality and the Engineer as an additional insured thereunder and shall protect the Municipality against all claims for all damage or injury including death to any person or persons and for damage to any property of the Municipality or any other public or private property resulting from or arising out of any act or omission on part of the Contractor or any of his servants or agents during the execution of the Contract.

200.19 LOSSES DUE TO ACTS OF NATURE, ETC.

All damage, loss, expense and delay incurred or experienced by the Contractor in the prosecution of the work, by reason of unanticipated difficulties, bad weather, strikes, wars, acts of nature, or other mischances, shall be borne by the Contractor and shall not be the subject of a claim for additional compensation.

400 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF DRAINS

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400 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF DRAINS

400.1 ABBREVIATIONS

i) MTO means the Ministry of Transportation of Ontario.
ii) ASTM means the American Society for Testing Materials.
iii) CSA means the Canadian Standard Association.
iv) OPSD means Ontario Provincial Standard Drawings
v) OPSS means Ontario Provincial Standard Specifications
vi) DFO means Fisheries and Oceans Canada
vii) MNRF means Ministry of Natural Resources and Forestry
viii) MECP means Ministry of Environment, Conservation and Parks

400.2 PRE CONSTRUCTION MEETING

The Contractor should arrange a pre-construction meeting with the Engineer, Municipality, affected landowners prior to commencement of construction.

If there is no pre-construction meeting or if a landowner is not present at the pre-construction meeting, the following shall apply. The drain is to be walked by the Contractor and each landowner prior to construction to ensure that both agree on the work to be done. Any difference of opinion shall be referred to the Engineer for decision. If the landowner is not contacted for such review, they are to advise the Engineer and/or Municipality.

400.3 COLD WEATHER

When working in cold weather is approved by the Engineer, the Contractor shall provide suitable means for heating, protection, and snow and ice removal. All work completed in cold weather conditions shall be to the satisfaction of the Engineer and any additional cost to remedy unsatisfactory work, or protect the work shall be borne by the Contactor. All backfilling operations shall be done as soon as possible to avoid backfilling with ground containing frozen particles. The Contractor will assume all responsibility for damages to any tile drains and for settlements or bank slippages that may result from work in cold weather.

400.4 WORKING AREA

Where any part of the drain is on a road allowance, the road allowance shall be the working area. For a closed drain the working area shall be a 10 metre width on either side of the trench or any combination not exceeding 20 metres. A 10m x 10m working area shall exist around any catchbasin, junction box or access point. For an open drain the working area shall be 17 metres on the side for leveling and 3 metres on the opposite side. A 10m working area shall exist for any overflow swale or grassed waterway. If any part of the drain is close to a property line then the fence line shall be one of the limits of the work area. Reduced or increased working areas will be described in detail on the Drawings.

400.5 ACCESS

The Contractor shall have access to the drain by entering the working area directly from road allowances or along access routes shown on the Drawings. All specifications governing fences, livestock and crops during drain construction apply to access routes. No other access routes shall be used unless first approved by the Engineer and the affected landowner. The Contractor shall contact each landowner prior to using the designated access routes. Contractor shall make good any damages caused by using the designated access routes.

400.6 ACCESS TO PROPERTIES ADJOINING THE WORK

The Contractor shall provide at all times and at no additional cost, adequate pedestrian access to private homes and commercial establishments unless otherwise authorized by the Engineer. Where interruptions to access have been authorized by the Engineer, reasonable notice shall be given by the Contractor to the affected landowners and such interruptions shall be arranged to minimize interference to those affected.

400.7 DRAINAGE SUPERINTENDENT

Where a Drainage Superintendent (Superintendent) is appointed by the Municipality, the Engineer may designate the Superintendent to act as the Engineer's representative. If so designated, the Superintendent will have the power to inspect and direct the execution of the work.

Any instructions given by the Superintendent which change the proposed work or with which the Contractor does not agree shall be referred to the Engineer for final decision.

400.8 ALTERATIONS TO WORK

The Engineer shall have the power to make alterations, additions and/or deletions in the work as shown or described in the Drawings or Specifications and the Contractor shall proceed to implement such changes without delay. Alterations ordered by the Engineer shall in no way render the contract void.

If a landowner desires deviations from the work described on the Drawings, the landowner shall submit a written request to the Engineer, at least 48 hours in advance of the work in question.

In every such case, the contract amount shall be increased or decreased as required according to a fair evaluation of the work completed. Where such changes involve additional work similar to items in the contract, the price for additional work shall be determined after consideration is given to the tendered price for similar items.

In no case shall the Contractor commence work considered to be extra work without the Engineer's approval. Payment for extra work is contingent on receipt of documentation to the satisfaction of the Engineer. Refer to the Extra Work Summary included in the Special Provisions.

400.9 ERRORS AND UNUSUAL CONDITIONS

The Contractor shall notify the Engineer immediately of any error or unusual conditions which may be found. Any attempt by the Contractor to correct the error without notice shall be done at the Contractor's risk. Any additional cost incurred by the Contractor to remedy an error or unusual condition without notice shall be borne by the Contractor. The Engineer shall direct the alteration necessary to correct errors or unusual conditions. The contract amount shall be adjusted in accordance with a fair evaluation of documentation for the work added, deleted or adjusted.

400.10 TESTS

The Engineer reserves the right to subject any materials to a competent testing laboratory for compliance with the standard. If any materials supplied by the Contractor are determined to be inadequate to meet the applicable standards, the Contractor shall bear full responsibility to remove and/or replace all such inadequate materials with materials capable of meeting the standards.

The cost of testing the materials supplied by the Contractor shall be borne by the Contractor.

400.11 BENCHMARKS AND STAKES

Prior to construction, the Engineer will confirm the benchmarks. The Contractor shall be held liable for the cost of replacing any benchmarks destroyed during construction.

If the Engineer provides layout stakes, the Contractor shall be held liable for the cost of replacing any layout stakes destroyed during construction.

Where property bars are shown on the Drawings, they are to be protected and if damaged by the Contractor, they will be reinstated by an Ontario Land Surveyor at the expense of the Contractor. Where property bars not shown on the Drawings are damaged, they will be reinstated by an Ontario Land Surveyor at the expense of the project.

400.12 OPENING UP OF FINISHED WORK

If ordered by the Engineer, the Contractor shall make such openings in the work as are needed to re-examine the work, and shall forthwith make the work good again. Should the Engineer find the work so opened up to be faulty in any respect, the whole of the expense of opening, inspecting and making the work good shall be borne by the Contractor. Should the Engineer find the work opened up to be in an acceptable condition the Contractor shall be paid for the expense of opening and making the work good, unless the Contractor has been obligated by any specification or by the direction of the Engineer to the leave the work open for the Engineer's inspection.

400.13 FINAL INSPECTION

Final inspection by the Engineer will be made within twenty (20) days after receiving notice in writing from the Contractor that work is complete, or as soon thereafter as weather conditions permit. All the work included in the contract must at the time of final inspection have the full dimensions and cross-sections.

Prior to commencing the final inspection an on-site meeting may be held by the Engineer and landowners directly affected by the construction of the drain. The Contractor will attend this meeting upon notice by the Engineer.

If there is no on-site meeting with the Engineer and landowners, the Contractor shall obtain from each landowner a written statement indicating that the work has been performed to the owner's satisfaction. If the Contractor is unable to obtain a written statement from the landowner, the Engineer will determine if further work is required prior to issuing the Completion Certificate.

400.14 WARRANTY

There shall be a one-year warranty period on all completed work. The warranty period will commence on the date of the Completion Certificate.

When directed by the Engineer, the Contractor shall repair and make good any deficiencies in the work that may appear during the warranty period.

Before the work shall be finally accepted by the Municipality, the Contractor shall complete all work as directed by the Engineer and remove all debris and surplus materials and leave the work neat and presentable.

400.15 MATERIALS

400.15.1 Concrete Drain Tile

Concrete drain tile shall conform to the requirements of the most recent ASTM C412 specifications for heavy duty extra quality, unless a stronger concrete tile is required by the Special Provisions or Drawings. All tile furnished shall be subject to the approval of the Engineer.

The minimum nominal lengths of the tile shall be 750mm for 150 to 350mm diameter tile and 1200mm for 400 to 900mm diameter tile.

All tile should be of good quality, free from distortions and cracks and shall meet the standards specified. The ends should be smooth and free from cracks or checks. All rejected tile are to be immediately removed from the site.

Granular backfill, where required, shall consist of approved sand or gravel having no particles retained on a screen having 50mm square openings.

Earth backfill shall consist of approved material having no large lumps or boulders.

400.15.2 Corrugated Plastic Tubing

Corrugated plastic tubing shall conform to the *Land Improvement Contractors of Ontario Standard Specification for Corrugated Plastic Drainage Tubing, 2006*. Type of material (solid or perforated) and need for filter sock will be specified on the Drawings or in the description of the work in the Special Provisions. Filter sock where specified shall be a standard synthetic filter material as provided by a recognized plastic tubing manufacturer unless noted differently on the contract drawings or elsewhere in the contract document. Protect coils of plastic tubing from damage and deformation.

400.15.3 Corrugated Steel Pipe

Corrugated Steel Pipe (CSP) shall be according to OPSS 1801 (CSA G401). Unless stated otherwise in the Special Provisions the pipe shall be:

- galvanized
- helical corrugation with lock seam and re-rolled annular ends
- 68mm x 13mm corrugation profile for diameters up to 1200mm
- 125mm x 25mm corrugation profile for diameters 1200mm and larger
- minimum wall thickness of 1.6mm for diameters up to 500mm
- minimum wall thickness of 2.0mm for diameters 600mm and larger
- joined using standard couplers matching the pipe diameter and material

Other coatings that may be specified include aluminized Type 2 or polymer. Polymer coating shall be a 254mm polymer film laminated to both sides of the pipe.

400.15.4 Plastic Pipe

Plastic Pipe shall be a high density polyethylene (HDPE) double wall corrugated pipe with smooth inner wall, solid with no perforations in accordance with OPSS 1840.

A minimum stiffness of 320 KPa at 5% deflection

The pipe shall be joined with snap-on or split couplers.

400.15.5 Concrete Sewer Pipe

Concrete sewer pipe shall be in accordance with OPSS 1820.

Non-reinforced concrete sewer pipe shall be used for pipe 375mm in diameter and smaller and reinforced concrete sewer pipe shall be used for pipe over 375mm.

Classes shall be as shown on the Contract Drawings or as described in the Form of Tender.

All new concrete sewer pipe shall have rubber-type gasket joints.

Where concrete sewer pipe “seconds” are specified, the pipe should exhibit no damage or cracks on the barrel section and shall be capable of satisfying the crushing strength requirements of OPSS 1820. The pipe may contain cracks or chips in the bell or spigot which prevent the use of rubber gaskets but the joints must be protected with filter cloth.

400.16 RIPRAP

All riprap is to be placed on a geotextile underlay (Terrafix 360R or equal) unless directed otherwise in the specific construction notes. The riprap is to be graded heavy angular stone (quarry stone is recommended) with particles averaging in size from 225mm to 300mm and is to be placed at 300mm thickness. Fine particles may be included to fill voids. Along upstream edges of riprap, where surface water will enter, underlay is to extend a minimum of 300mm upstream from riprap and then be keyed down a minimum of 300mm. Wherever riprap is placed, the area is to be over-dug so that finished top of riprap is at design cross-section, at design elevation or flush with existing ground.

400.17 GEOTEXTILE

To be non-woven fabric that is rot proof, non-biodegradable, chemically resistant to acidic or alkaline soils and is dimensionally stable under different hydraulic conditions. The filter fabric is to be a material whose primary function is to act as a highly permeable, non-clogging soil separator for fine soils (Terrafix 360R or equal). Contractor is to follow the manufacturer's recommendations for cutting, installation and precautions necessary to avoid damage to fabric. Other approved equals will be considered by the Engineer prior to construction.

400.18 DISPOSAL OF MATERIALS

The Contractor shall remove all surplus materials from the job site at the end of the project. The Contractor shall locate the disposal site for all materials to be disposed of. Disposal of materials shall comply with applicable regulations.

400.19 NOTIFICATION OF RAILROADS, ROAD AUTHORITIES AND UTILITIES

Contractor will notify any Railroad, Road Authority or Utility at least 48 hours in advance regarding work to be performed on their property or affecting their infrastructure. The notice will be in writing and is exclusive of Saturdays, Sundays and Holidays.

A utility includes any entity supplying the general public with necessaries or conveniences.

400.20 WORKING IN ROAD ALLOWANCES

400.20.1 General

Work within public road allowances shall be done in accordance with the Ontario Traffic Manual Book 7, latest edition.

400.20.2 Road Crossings

If no specific detail is provided for road crossings on the drawings or in the specifications the following shall apply:

- A Road Authority will supply no labour, equipment or materials for the construction of the road crossing.
- Contractor will not commence road crossing work until any required permits have been obtained. The Engineer may apply for any required permits prior to construction.
- Contractor will notify the Road Authority at least 72 hours in advance of any construction in the road allowance.
- Road crossings may be made with an open cut unless otherwise noted.
- Exact location of crossing shall be verified with the Road Authority and the Engineer.
- Pipe shall be placed on a minimum 150mm depth of Granular A shaped for the pipe.
- Pipe backfill shall be compacted Granular A and extend 300mm above the top of the pipe.
- Trench shall be backfilled with acceptable native material for the base width of the road bed.
- The material shall be placed in lifts not exceeding 300mm in depth and shall be thoroughly compacted with an approved mechanical vibrating compactor.
- Top 600mm of the road bed backfill shall consist of 450mm Granular B and 150mm of Granular A placed in lifts and fully compacted.
- Any surplus excavated material within the road allowance may be spread on the right-of-way with consent of the Road Superintendent otherwise the surplus material shall be hauled away.
- Existing asphalt or concrete pavement or surface treatment shall be replaced by the Contractor to the satisfaction of the Engineer and Road Authority.
- Contractor shall be responsible for correcting any backfill settlement during construction and during the warranty period. Upon approval of the road authority, surplus gravel shall be stockpiled near gravel road crossings to provide backfill for future trench settlement.
- All road crossings shall meet the approval of the Road Authority.
- If any road crossing is not left in a safe manner at the end of the working day barricades and warning signs shall be erected to guarantee the safety of the travelling public.
- If the Engineer deems a road to surface to have been damaged by the construction of a drain, either across or along the road, the Engineer may direct the Contractor to restore the road surface to existing or better condition at no additional cost.

400.20.3 Maintenance of Traffic

Unless directed otherwise on the drawings or in the specifications the Contractor shall keep the road open to traffic at all times. The Contractor shall provide suitable warning signs and/or flagging to the satisfaction of the Road Authority to notify of the construction work.

If a detour is required, the Contractor shall submit a proposal as to the details of the detour for approval by the Road Authority. If necessary to close the road to through traffic, the Contractor shall provide for and adequately sign the detour route. Contractor shall undertake all notifications required for a road closure in consultation with the Municipality.

400.21 LOCATIONS OF EXISTING UTILITIES

The position of pole lines, conduits, watermains, sewers and other underground and overhead utilities are not necessarily shown on the Contract Drawings, and, where shown, the accuracy of the position of such utilities and structures is not guaranteed. Before starting work, the Contractor shall have all utilities located in accordance with the Ontario Underground Infrastructure Notification System Act.

All utilities shall be exposed to the satisfaction of the utility company to verify that the construction proposed will not conflict with the utility structure. Additional payment will be allowed for relocation of utilities if conflicts should occur.

The Contractor is responsible for protecting all located and exposed utilities from damage during construction. The Contractor shall assume liability for damage caused to all properly located utilities.

400.22 LANEWAYS

If no specific detail is provided for laneway crossings on the Drawings or in the Specifications the following shall apply:

- Pipe backfill shall be acceptable native material that can be compacted in place.
- Top 450mm of laneway backfill shall consist of 300mm Granular B and 150mm of Granular A placed in lifts and fully compacted.
- Minimum cover on laneway culverts shall be 300mm.
- Existing asphalt or concrete pavement or surface treatment shall be replaced by the Contractor.
- The width of surface restoration shall match the existing laneway.
- Contractor shall be responsible for correcting any backfill settlement during construction and during the warranty period.

The timing of laneway closures will be coordinated by the Contractor to the satisfaction of the landowner.

400.23 EXISTING CROSSING CLEANOUT

Where the Special Provisions require an existing crossing to be cleaned, the Contractor shall provide a bottom width and depth that provides capacity equivalent to the capacity of the channel on either side. Excavated materials shall be hauled away unless adjacent landowners give permission for leveling. Care shall be taken to ensure that existing abutments or any portion of the structure are not damaged or undercut. The method of removing the material is to be pre-approved by the Engineer.

400.24 FENCES

If the Contractor is responsible to remove and install fences, the following shall apply:

- All fences removed by a Contractor are to be re-erected in as good a condition as existing materials permit.
- All fences shall be properly stretched and fastened. Where directed by the Engineer, additional steel posts shall be placed to adequately support a fence upon re-erection.
- Where practical and where required by the landowner, the Contractor shall take down an existing fence at the nearest anchor post and roll the fence back rather than cutting the fence and attempting to patch it.
- Where fence materials are in such poor condition that re-erection is not possible, the Contractor shall replace the fence using equivalent materials. Such fence material shall be approved by the Engineer and the landowner. Where the Engineer approves new fence material, additional payment will be provided.

Any fences paralleling an open drain, that are not line fences, that hinder the proper working of the excavating machinery for drain construction or maintenance shall be removed and rebuilt by the landowner at their own expense. If such parallel fences are line fences they shall be removed and reinstalled by the Contractor.

No excavated or cleared material shall be placed against fences.

The installation of all fences shall be done to the satisfaction of the Engineer and the landowner.

400.25 LIVESTOCK

If any construction will be within a fenced field containing livestock that are evident or have been made known to the Contractor, the Contractor shall notify the owner of the livestock 48 hours in advance of access into the field. Thereafter, the owner shall be responsible for the protection of the livestock in the field during construction and shall also be liable for any damage to or by the livestock.

Where the owner so directs or where the Contractor has failed to reach the owner, the Contractor shall adequately re-erect all fences at the end of each working day. No field containing livestock shall have a trench left open at the end of the working day, unless the trench has been adequately backfilled or protected. Failure of the Contractor to comply with this paragraph shall render the Contractor liable for any damage to or by the livestock.

Where livestock may be encountered on any property the Contractor shall notify the Engineer to arrange for inspection of the work prior to backfilling.

400.26 STANDING CROPS

The Contractor shall not be held responsible for damages to standing crops within the working area for the drain. However, the Contractor shall notify the owner of the crops 48 hours prior to commencement of construction so as to allow the owner an opportunity to harvest or salvage the crop within the drain working area. If this advance notice is not given the Contractor may be liable for the loss of the standing crops.

400.27 CLEARING VEGETATION

400.27.1 General
The area for clearing, if not defined elsewhere, shall be 15m on each side of the drain.

400.27.2 Trees to Remain
Where it is feasible to work around existing trees that do not impede the function of the drainage works, the Contractor shall not remove any deciduous tree larger than 300mm and any coniferous tree larger than 200mm, unless authorized by the Engineer.

400.27.3 Incidental Clearing
Incidental clearing includes removal of trees, brush or other vegetation with an excavator during construction activities, and the cost is to be included in the price for the related construction activity.

400.27.4 Power Brushing
Power brushing includes removal of above-ground vegetation with a rotary brush cutter or other mechanical means. Stump and root removal is not required. Power brushed vegetation in a channel cross-section shall be removed and leveled in the working area. Excavated material may be placed and leveled on power brushed vegetation.

400.27.5 Close-Cut Clearing
Close-cut clearing includes removal of above-ground vegetation cut flush with the ground. Stump and root removal is not required.

400.27.6 Clearing And Grubbing
Clearing and grubbing includes removal of vegetation, including stumps and roots. Removal of earth from the grubbed area into the windrows or piles is to be minimized.

400.27.7 Disposal of Cleared Vegetation

400.27.7.1 *In Bush Areas*

Cleared vegetation is to be pushed into windrows or piles at the edge of the cleared area. Stumps and roots are to be piled first at the edge of the cleared area, followed by other vegetation (trunks, branches, etc.). Provisions for lateral drainage are required through all windrows. Windrows are not to block any laneways or trails. After removing cleared vegetation, the working area shall be leveled to the satisfaction of the Engineer.

400.27.7.2 *In Field Areas*

Cleared vegetation resulting from incidental clearing or power brushing may be hauled away, mulched in place or reduced to a size that permits cultivation using conventional equipment without causing undue hardship on farm machinery.

Cleared vegetation resulting from close-cut clearing or clearing and grubbing is to be hauled away to an approved location. Disposal sites may be in bush areas or other approved locations on the same farm. No excavated material shall be levelled over any logs, brush or rubbish of any kind.

400.27.8 Landowner Requested Salvage

A landowner may request that wood be separated from the windrows for the landowner's future use. This additional work would be eligible for extra payment, subject to the approval of the Engineer. The cost of the additional work would be assessed to the landowner.

400.27.9 Clearing by Landowner

Wherever the Special Provisions indicate that clearing may be undertaken by the landowner, work by the landowner shall be in accordance with the Clearing Vegetation requirements of this specification and must be completed so as not to cause delay for the Contractor. If the landowner does not complete clearing in accordance with these requirements, the Contractor will undertake the clearing at a price approved by the Engineer.

400.28 ROCK REMOVAL

400.28.1 General

Rock shall be defined as bedrock and boulders that are greater than one-half cubic metre in size and that require blasting or hoe-ram removal. Bedrock or boulders that can be removed with a standard excavator bucket are not considered rock removal.

400.28.2 Blasting Requirements

All blasting shall be performed by a competent, qualified blaster in accordance with OPSS 120. Blasting mats are required. A pre-blast survey meeting the requirements of OPSS 120 must be completed for any structure within 200m of any blasting. The cost for pre-blast survey shall be included in the tender price for rock removal.

400.28.3 Typical Sections and Pay Limits

For tile drains and road culverts, rock shall be removed to 150mm below the proposed grade shown on the profile so that pipes are not in direct contact with rock. The width of rock removal shall be 1m minimum or the diameter of the pipe plus 600mm.

For open drains, rock removal shall match the proposed grade and bottom width shown on the Drawings. Side slopes shall be vertical or sloped outward. Side slopes shall be free of loose rock when excavation is completed.

Payment for the quantity of rock removed will be based on the typical sections described in these specifications and confirmed by field measurements. There will be no payment for overbreak.

400.28.4 Disposal of Rock
Excavated rock shall be piled at the edge of the working area at locations designated by the landowner. The cost to pile excavated rock shall be included in the tender price for rock removal. If the Special Provisions or the landowner require excavated rock to be hauled away, additional payment will be considered.

Where approved by the Engineer, excavated rock may be used in place of imported riprap.

400.29 SEEDING

400.29.1 General
Contractor responsible for re-seeding as necessary for uniform catch during warranty period.
Areas that remain grassed after construction may not need to be seeded unless directed otherwise by the Engineer.

400.29.2 Drainage Works and Road Allowances
All disturbed ditch banks, berms and road allowances are to be seeded at the end of the day.

The following seed mixture shall be applied at 60kg/ha using a mechanical (cyclone) spreader:

- 35% Creeping Red Fescue
- 25% Birdsfoot Trefoil
- 25% Kentucky Bluegrass
- 10% Cover Crop (Oats, Rye, Barley, Wheat)
- 5% White Clover

Provide temporary cover for late fall planting by adding an additional 10 kg/ha of rye or winter wheat.

400.29.3 Hydroseeding
Where hydroseeding is specified, disturbed areas will be restored by the uniform application of a standard roadside mix, fertilizer, mulch and water at a rate of 2,000 kg/ha and be in accordance with OPSS 804.

400.29.4 Seeding Lawns
Unless specified otherwise, lawn areas shall be seeded with Canada No. 1 lawn grass mixture applied at 300 kg/ha using a mechanical (cyclone) spreader on 100mm of topsoil. Fertilizer shall be 5:20:20 or 10:10:10 applied at 300 kg/ha. Seed and fertilizer shall be applied together. Contractor shall arrange for watering with landowners.

400.29.5 Sod
Where sod is specified, sod is to be commercial grade turfgrass nursery sod, Kentucky Bluegrass placed on 50mm of topsoil. Fertilizer shall be 5-20-20 applied at 10kg/ha. Place sod in accordance with supplier instructions. Contractor is responsible for saturating the sod with water on the day of sod placement. Subsequent watering is the responsibility of the landowner.

400.30 EROSION CONTROL BLANKETS

Erosion Control Blankets (ECB) shall be biodegradable and made of straw/coconut (Terrafix SC200, Nilex SC32 or equal) or coconut (Terrafix C200, Nilex C32 or equal) with photodegradable, double net construction. The blanket and the staples shall be supplied and installed as per OPSS 804.

Erosion control blanket shall be placed and stapled into position as per the manufacturer's installation instructions on slopes as directed by the Engineer. Blankets shall be installed in direct contact with the ground surface to form a uniform, cohesive mat over the seeded earth area. The blankets are to be single course with 150mm overlap between blankets and joints are to be staggered. The Contractor shall ensure that the ECB is anchored to the soil and that tenting of the ECB does not occur.

On slopes, when the ECB cannot be extended 1m beyond the crest of the slope, the uppermost edge of the ECB shall be anchored in a 150mm wide by 150mm deep trench. The trench shall be backfilled with earth and compacted.

400.31 SEDIMENT CONTROL

400.31.1 General

Contractor shall install sediment control features at the downstream limits of the project and at other locations as shown on the drawings or directed by the Engineer.

Sediment control features shall be installed prior to any excavation taking place upstream of that location. The Contractor shall maintain all sediment control features throughout construction and the warranty period.

Sediment that accumulates during construction shall be removed and levelled as required.

400.31.2 Flow Check Dams

400.31.2.1 *Temporary Straw Bale Flow Check Dam*

The straw bale flow check dam shall consist of a minimum of 3 bales. Each bale is to be embedded at least 150mm into the channel bottom and shall be anchored in place with 2 T-bar fence posts or 1.2m wooden stakes driven through the bale.

Straw bales shall be hauled away at the end of the warranty period. Accumulated sediments shall be excavated and levelled when the temporary straw bale flow check dam is removed.

400.31.2.2 *Temporary Rock Flow Check Dam*

The temporary rock flow check dam shall extend to the top of the banks so that dam overtopping does not cause bank erosion. Rock shall be embedded a minimum of 150mm into the ditch bottom and banks. No geotextile is required for temporary rock flow check dams.

Accumulated sediments shall be excavated and levelled when the temporary rock flow check dam is removed at the conclusion of the warranty period.

400.31.2.3 *Permanent Rock Flow Check Dam*

The requirements of temporary rock flow check dams shall apply except rock shall be placed on geotextile and the dam shall remain in place permanently.

400.31.3 Sediment Traps

400.31.3.1 *General*
The channel bottom shall be deepened in accordance with the dimensions provided in the Drawings or Special Provisions. If dimensions are not specified on the Drawings, the sediment trap shall be excavated within the channel cross-section at least 0.3m below the design grade.

The Contractor will monitor the sediment trap during construction and cleanout accumulated sediments as required to maintain the function of the sediment trap.

If specified to be temporary, no sediment trap maintenance is required after construction is complete.

If specified to be permanent, the contractor will clean out the sediment trap at the conclusion of the warranty period, unless directed otherwise by the Engineer.

400.31.3.2 *Sediment Trap with Flow Check Dam*
A permanent rock sediment trap shall include a permanent sediment trap and a rock flow check dam.

A temporary rock/straw sediment trap shall include a temporary sediment trap and a rock/straw flow check dam.

400.31.4 Turbidity Curtains

A turbidity curtain is required when there is permanent water level/flow and a sediment trap is not feasible.

Turbidity curtains shall be in accordance with OPSS 805 and installed per manufacturer's instructions.

Turbidity curtains shall be sized and anchored to ensure the bottom edge of the curtain is continuously in contact with the waterbody bed so that sediment passage from the enclosed area is prevented. The curtain must be free of tears and capable of passing the base flow from the drainage works. Turbidity curtain locations may be approved by the Engineer.

Turbidity curtains are to remain functional until work in the enclosed area is completed. Prior to relocating or removing turbidity curtains, accumulated sediment is to be removed from the drain and levelled.

Where a turbidity curtain remains in place for more than two weeks it shall be inspected for damage or clogging and replaced, repaired or cleaned as required.

400.31.5 Silt Fence

Silt fence shall be in accordance with OPSS 805.07.02.02 and OPSD 219.110 (light-duty).

400.32 GRASSED WATERWAYS AND OVERFLOW SWALES

Grassed waterways and overflow swales typically follow low ground along the historic flow route. The cross-section shall be saucer shaped with a nominal 1m bottom width, 8:1 side slopes and 300mm depth unless stated otherwise in the Special Provisions.

All grassed waterways are to be permanently vegetated. Grassed waterways shall be seeded with the following permanent seed mixture: 50% red fescue, 45% perennial ryegrass and 5% white clover, broadcast at 80 kg/ha. Fertilizer to be 7-7-7 applied at 80 kg/ha.
Provide temporary cover for late fall planting by adding an additional 10 kg/ha of rye or winter wheat.

Overflow swales may be cropped using conventional farming practice.

400.33 BUFFER STRIPS

Open drains shall include minimum 3m wide, permanently vegetated buffer strips on each side of the drain. Catchbasins shall include a minimum 1m radius, vegetated buffer strip around the catchbasin.

Cultivation of buffer strips using conventional farming practice may be undertaken, provided sediment transport into the drain is minimized.

400.34 MAINTENANCE CORRIDOR

The maintenance corridor along the route of the drain, as established in the report, shall be kept free of obstructions, ornamental vegetation and structures. When future maintenance is undertaken, the cost of removing such items from the corridor shall be assessed to the landowner.

400.35 POLLUTION

The Contractor shall keep their equipment in good repair. The Contractor or any landowner shall not spill or cause to flow any polluted material into the drain that is not acceptable to the MECP. The local MECP office and the Engineer shall be contacted if a polluted material enters the drain. The Contractor shall refill or repair equipment away from open water. If the Contractor causes a spill, the Contractor is responsible to clean-up the spill in accordance with MECP clean-up protocols.

400.36 SPECIES AT RISK

If a Contractor encounters a known Species At Risk designated by the MECP, MNRF or DFO, the Contractor shall notify the Engineer immediately and follow the Ministry's guidelines for work around the species.

410 **STANDARD SPECIFICATIONS**

FOR

OPEN DRAINS

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410.1 DESCRIPTION

Work under this item shall include the supply of labour, equipment and materials required for: channel excavation to the cross-section specified, leveling or disposal of all excavated material (spoil) as directed, reconstruction of all intercepted drains as required and any other items related to open drain construction as required by the Schedule of Tender Prices, Special Provisions or the Drawings.

410.2 MATERIALS

Refer to Section 400, Standard Specifications for Drain Construction for any materials required for open drain construction.

410.3 CONSTRUCTION

410.3.1 Excavation

The bottom width and the side slopes of the ditch shall be as shown on the profile drawing. If the channel cross-section is not specified in the Special Provisions it shall be a 1m bottom width with 1.5m horizontal to 1m vertical (1.5:1) bank slope. At locations along the drain where the specified side slopes change there shall be a transitional length of not less than 5m between the varying side slopes. At locations along the drain where the specified bottom width changes there shall be a transitional length of not less than 5m. In all cases there shall be a smooth transition between changes in any part of the channel cross-section. Where the bottom width of the existing ditch matches the specified bottom width, ditch excavation shall be completed without disturbing existing banks.

410.3.2 Low Flow Channels

Unless specified otherwise in the Special Provisions, all intermittent open drains with a bottom width greater than 1.8m and a grade less than 0.07%, shall have a low flow channel. The bottom of the low flow channel shall be the grade shown on the profiles.

The low flow channel shall have a U-shaped cross-section with an average top width of 0.5m and a minimum depth of 0.3m. The low flow channel will not be seeded and may meander along the main channel bottom provided it remains at least .3m from the toe of main channel bank slope.

410.3.3 Line

The drain shall be constructed according to the alignment shown on the drawings or shall follow the course of the existing ditch. All bends shall have a minimum inside radius of 2m. There shall be a smooth transition between changes in the channel alignment. The Contractor shall contact the Engineer before removing any bends or irregularities in an existing ditch.

410.3.4 Grade Control

The profile shows the grade line for the bottom of the ditch. Cuts may be shown on the profile from the existing top of bank and/or from the existing ditch bottom to the new ditch bottom. These cuts are shown for the convenience of the Contractor and are not recommended for quantity estimate or grade control. Accurate grade control must be maintained by the Contractor during ditch excavation. The ditch bottom elevation should be checked every 50 metres and compared to the elevation on the profile.

Benchmarks are identified on the Contract Drawings. The Engineer will confirm all benchmark elevations prior to construction.

410.3.5 Variation from Design Grade

A variation of greater than 25mm above the design grade line may require re-excavation. Excavation below design grade up to 150mm is recommended so that sediment accumulation during or following excavation will not place the ditch bottom above the design grade at completion. Under some circumstances the Engineer may direct that over excavation greater than 200mm will have to be backfilled. No additional payment will be made if backfilling is required to remedy over excavation.

410.3.6 Excavated Material

Excavated material (spoil) shall be deposited on either or both sides of the drain within the specified working area as directed in the Special Provisions. The Contractor shall verify the location for the spoil with each landowner before commencing work on their property. If not specified, spoil shall be placed on the low side of the ditch or opposite trees and fences. The spoil shall be placed a minimum 1m from the top of the bank. No excavated material shall be placed in tributary drains, depressions, or low areas such that water is trapped behind the spoil bank. Swales shall be provided through the leveled or piled spoil at approximately 60m intervals to prevent trapping water behind the spoil bank.

The excavated material shall be placed and leveled to a maximum depth of 250mm; unless otherwise instructed. If excavating more than 450mm topsoil shall be stripped, stockpiled separately and replaced over the leveled spoil, unless stated otherwise in the Special Provisions. The edge of the spoil bank furthest from the ditch shall be feathered down to existing ground. The edge of the spoil bank nearest the ditch shall have a maximum slope of 2:1. The material shall be leveled such that it may be cultivated with conventional equipment without causing undue hardship on farm machinery.

Wherever clearing is necessary prior to leveling, the Contractor shall remove all stumps and roots from the working area. No excavated material shall cover any logs, brush or rubbish of any kind. Large stones in the leveled spoil that are greater than 300mm in diameter shall be moved to the edge of the spoil bank nearest to the ditch but in general no closer than 1m to the top of bank.

Lateral channels that outlet into the drain shall be tapered over a distance of 10m to match the grade of drain excavation. No additional payment will be made for this work.

Where the elevation difference between the lateral channel and the drain is greater than 450mm, a rock chute or similar bank protection approved by the Engineer shall be provided. Additional payment may be allowed for this work.

Where it is specified to straighten any bends or irregularities in the alignment of the ditch or to relocate any portion of an existing ditch, the excavation from the new cut shall be used for backfilling the original ditch. Regardless of the distance between the new ditch and old ditch, no additional payment will be allowed for backfilling the existing ditch.

The Contractor shall contact the Engineer if a landowner indicates in writing that spoil on the owner's property does not need to be leveled. The Engineer may release the Contractor from the obligation to level the spoil and the Engineer shall determine the credit to be applied to the Contractor's payment. No additional compensation is provided to the owner if the spoil is not leveled.

The Engineer may require the Contractor to obtain written statements from any or all of the landowners affected by the leveling of the spoil. Final determination on whether or not the leveling of spoil meets the specification shall be made by the Engineer.

410.3.7 Excavation at Existing Bridge and Culvert Sites

The Contractor shall excavate the drain to the specified depth under all bridges and to the full width of the structure unless specified otherwise in the Special Provisions. All necessary care and precautions shall be taken to protect permanent structures. Temporary bridges may be removed and left on the bank of the drain. In cases where the design grade line falls below the top of footings, the Contractor shall take care to not over-excavate below the grade line. The Contractor shall notify the Engineer if excavation of the channel exposes the footings of the bridge or culvert, so the Engineer can make an evaluation.

The Contractor shall clean through all pipe culverts to the grade line and width specified on the profile. The Contractor shall immediately contact the Engineer after a culvert cleanout if it is found that the culvert bottom is above the grade line or where the structural integrity of the culvert is questionable.

Material resulting from cleanout through bridges or culverts shall be levelled on the adjacent private lands or hauled offsite at the expense of the bridge/culvert owner.

410.3.8 Bridges and Culverts

The size and material for any new ditch crossings shall be as outlined in the Special Provisions.

For culvert installation instructions, refer to the General Specifications for Drain Construction and the Drawings.

Any crossings assembled on-site shall be assembled in accordance with the manufacturer's specifications.

If directed on the drawings that the existing crossing is to be salvaged for the owner, the Contractor shall carefully remove the existing crossing and place it beside the ditch or haul to a location as specified by the owner. If the existing crossing is not to be saved then the Contractor shall remove and dispose of the existing crossing. Disposal by burying on-site must be approved by the Engineer and the owner.

All new pipe crossings shall be installed at the invert elevations as specified on the Drawings, usually a minimum of 50mm below design grade. If the ditch is over excavated greater than 200mm below design grade the Contractor shall confirm with the Engineer the elevations for installation of the new pipe crossing.

For backfill and surface restoration, refer to the General Specifications for Drain Construction and the Drawings.

Installation of private crossings during construction must be approved by the Engineer.

410.3.9 Obstructions

All trees, brush, fallen timber and debris shall be removed from the ditch cross-section and as required for spreading of the spoil. The roots shall be left in the banks if no bank excavation is required as part of the new channel excavation. In wooded or heavily overgrown areas all cleared material may be pushed into piles or rows along the edge of the cleared path and away from leveled spoil. All dead trees along either side of the drain that may impede the performance of the drain if allowed to remain and fall into the ditch, shall be removed and put in piles, unless directed otherwise by the Engineer.

410.3.10 Tile Outlets

The location of all existing tile outlets may not be shown on the profile for the drain. The Contractor shall contact each owner and ensure that all tile outlets are marked prior to commencing excavation on the owner's property. If a marked tile outlet or the tile upstream is damaged due to construction, it shall be replaced at the Contractor's expense. Additional payment will be allowed for the repair or replacement of any unmarked tile outlets encountered during excavation. In all cases, if an existing tile outlet requires replacement the Contractor shall confirm the replacement tile outlet with the Engineer. Where riprap protection exists at any existing tile outlet such protection shall be removed and replaced as necessary to protect the outlet after reconstruction of the channel.

If any tile outlet becomes plugged as a result of construction, the Contractor shall remove the obstruction.

410.3.11 Completion

At the time of final inspection, all work in the contract shall have the full dimensions and cross-sections specified.

420 **STANDARD SPECIFICATIONS**

FOR

TILE DRAINS

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420 STANDARD SPECIFICATIONS FOR TILE DRAINS

420.1 DESCRIPTION

Work under this specification will consist of supplying, hauling, laying and backfilling subsurface drainage conduit with the conduit materials as described on the Drawings and in the location, depth and invert grade as shown on the Drawings. In this specification the word "tile" will apply to all described conduit materials. Lengths are in millimeters (mm) and meters (m).

The work shall include the supplying of all labour, tools, equipment and extra materials required for the installation of the tile; the excavation and backfilling of the trenches; the hauling, handling, placing and compaction of the excavated material for backfill, the loading, hauling, handling and disposal of surplus excavation material; the removal and replacing of topsoil and sod where required by the Engineer.

All existing laterals crossed by the new line shall be reconnected in an approved manner. Either special manufactured connections shall be used or another method of sealing connections as approved by the Engineer. The Contractor shall also construct catchbasins, junction boxes and other structures where directed by the Engineer.

Except where complete removal of an existing pipe is required by new construction, existing pipes to be abandoned shall be sealed with a concrete or mortar plug with a minimum length of 300mm to the satisfaction of the Engineer.

Sections 6 and 7 of the current version of the *Drainage Guide for Ontario*, OMAFRA Publication 29 shall provide a general guide to all methods and materials to be used in the construction of tile drains except where superseded by this Contract.

The licensing requirements of the *Agricultural Tile Drainage Installation Act, 1990* will not be applicable to this Contract unless specified otherwise by this Contract.

420.2 MATERIALS

Refer to Section 400, Standard Specifications for Drain Construction for any materials required for tile drain construction.

420.3 CONSTRUCTION

420.3.1 Outlet

A tile drain outlet into a ditch or creek shall be protected using a 6m length of rigid pipe with a hinged grate for rodent protection. Maximum spacing between bars on the rodent grate shall be 50mm. Material for rigid pipe will be specified in the Special Provisions, plastic pipe is preferred. The joint between the rigid pipe and the tile drain shall be wrapped with filter fabric. All outlets will be protected with rock riprap to protect the bank cut and as a splash apron. In some locations riprap may also be required on the bank opposite the outlet. The quantity of riprap required will be specified in the Special Provisions. A marker stake as approved by the Engineer shall be placed at each tile outlet.

420.3.2 Line

The Engineer will designate the general location of the new drain. A landowner may indicate a revised location for the drain which must be approved by the Engineer. Where a change in alignment is required that is not accommodated in a catchbasin, junction box or similar structure the alignment change shall run on a curve with a radius not less than the minimum installation radius specified for the tile material.

The Contractor shall exercise care to not disturb any existing tile drains which parallel the course of the new drain, particularly where the new and existing tile act together to provide the necessary capacity. Where an existing tile is disturbed or damaged the Contractor shall perform the necessary correction or repair with no additional compensation.

NOTE: It is the Contractor's responsibility to ascertain the location of, and to contact the owners of all utility lines, pipes and cables in the vicinity of drain excavations. The Contractor shall be completely responsible for all damages incurred.

420.3.3 Grade Control

Tile is to be installed to the elevation and grade shown on the profiles. Accurate grade control must be maintained by the Contractor at all times during tile installation. The tile invert elevation should be checked every 50m and compared to the elevation on the profile.

Benchmarks are identified on the Contract Drawings. The Engineer will confirm all benchmark elevations prior to construction.

420.3.4 Variation from Design Grade

No reverse grade will be allowed. A small variation in grade can be tolerated where the actual capacity of the drain exceeds the required capacity. The constructed grade should be such that the drain will provide the capacity required for the drainage area. Constructed grade should not deviate from design grade by more than 10% of the internal diameter for more than 25m. Grade corrections shall be made gradually over a distance not less than 10m.

420.3.5 Installation

At each work stoppage, the exposed end of the tile shall be covered by a tight fitting board or metal plate. No installed tile shall be left exposed overnight. Any tile damaged or plugged during construction shall be replaced or repaired at the Contractor's expense.

Topsoil over the trench shall be stripped, stockpiled separately and replaced after the trench is backfilled. Where installation is across a residential lawn, existing sod over the trench shall be cut, lifted and replaced in a workmanlike manner or new sod laid to match pre-construction conditions.

420.3.5.1 Installation of Concrete Tile

Concrete tile shall be installed by a wheel trencher unless an alternate method of construction is noted on the Drawings.

Digging of the trench shall start at the outlet end and proceed upstream. The location and grade shall be as shown on Drawings but shall be liable to adjustment or change by the Engineer on site with no additional payment allowed except where the change involves increased depth of cut beyond the limitation of the wheel trencher in use at the time of the change. The trench width measured at the top of the tile should be at least 150mm greater than the tile diameter.

The bottom of the trench is to be cut accurately to grade and shaped so that the tile will be embedded in undisturbed soil or in a compacted bed at least for 10% of its overall height. Where hard shale, boulders or other unsuitable bedding material is encountered, the trench shall be excavated to 75mm below grade and backfilled with granular material compacted to a shaped, firm foundation. If the trench is overcut below the proposed grade, it is to be backfilled with granular material to the correct grade and compacted to a shaped, firm foundation.

Where the depth for the tile installation exceeds the depth capacity of the wheel trencher the Contractor shall excavate a trench of sufficient depth so that the wheel trencher can install the tile at the correct depth

and grade. The tender price shall include the cost of the additional excavation and backfilling and stripping and replacing topsoil over the trench.

The inside of the tile is to be kept clean during installation. All soil and debris should be removed before the next tile is laid. Maximum spacing at joints between tiles should be about 3mm. Directional changes can be made without fittings or structures provided the centre-line radius of the bend is not less than 15m radius. The tiles are to be beveled, if necessary, to ensure close joints on all bends.

All tile joints and connections with other pipe materials are to be fully and tightly wrapped with a minimum 300mm width of geotextile drain wrap. A 150mm overlap on top is required. No additional payment will be made for joint wrapping.

420.3.5.2 Installation of Corrugated Plastic Tubing

Corrugated plastic tubing shall be installed by a drainage plow or wheel trencher unless an alternate method of construction is specified on the Drawings. For other installation methods, proper bedding and backfill is required to maintain the structural integrity of the plastic tubing so that surface and earth loads do not deflect the tubing by more than 20% of its nominal diameter.

For all installation methods:

- the plastic tubing should not be stretched by more than 7% of its normal length
- protect tubing from floating off grade when installing in saturated soil conditions
- directional changes can be made without fittings provided the centre-line radius of the bend is not less than five times the tubing diameter

Drainage plow equipment should construct a smooth bottomed opening in the soil and maintain the opening until the tubing is properly installed. The size of the opening in the soil should conform closely to the outside diameter of the tubing.

420.3.5.3 Installation of Concrete Sewer Pipe or Plastic Pipe

The Contractor may install pipe using a wheel trencher. For concrete sewer pipe, the bells must be recessed.

The Contractor may install pipe using an excavator by shaping the bottom of the trench to receive and support the pipe over 10% of its diameter if the trench is backfilled with native material. Shaping the trench bottom is not required where 150mm of granular bedding is placed to the satisfaction of the engineer.

420.3.6 Backfilling

All tile should be blinded by the end of the day's work to protect and hold them in place against disturbances. After tile is inspected, it shall initially be backfilled with a minimum cover of 300mm.

For blinding and initial backfilling use clean native soil with no organic matter. Initial backfill shall be tamped around the pipe by backhoe bucket or similar if directed by the Engineer.

The tile shall be backfilled with native material such that there is a minimum cover of 600mm. In addition, a sufficient mound must be placed over the trench to ensure that no depression occurs after settling along the trench.

420.3.7 Tile Connections

All lateral drains encountered along the route of the new tile drain are to be connected to the new drain if the intercepted tile are clean and do not contain polluted water. Lateral drains that are full of sediments or contain polluted waters will be addressed by the Engineer at the time of construction. All lateral drains are to be connected to the new tile using a pipe material and size that will provide the same flow capacity as the existing lateral drain unless a different connection is described in the Special Provisions. Corrugated plastic tubing can be used for all tile connections. Tubing can be solid or perforated, filter sock is not required.

Contractor is responsible for installation and backfilling in a manner than maintains the structural integrity of the connection. Manufactured fittings should be used to ensure tight connections. Where an opening must be made in the new tile drain for a connection, the opening shall be field cut or cored. After the opening is cut in the new tile any gaps or voids around the connection shall be sealed with mortar, low-expanding spray foam or geotextile. Lateral tubing shall not protrude more than 25mm beyond the inside wall of the new tile drain. The Contractor shall ensure than any material used to seal the connection does not protrude beyond the inside wall of the new tile drain.

All connections that are described in the Special Provisions are considered to be part of the original Contract price. For all other connections the Contractor will be paid in accordance with the price established in the Schedule of Tender Prices. The Contractor must list all connections on the Lateral Connection Summary sheet, if included in the Special Provisions, in order to qualify for payment. The Lateral Connection Summary sheet describes all tile encountered based on location (station), side of trench, size and type of tile and approximate length and type of material used for the connection.

420.3.8 Stones and Rock

The Contractor shall immediately contact the Engineer if bedrock or stones of sufficient size and number are encountered such that installation by wheel trencher cannot continue. The Engineer may direct the Contractor to use some other method of excavation to install the tile. The basis of payment for such extra work shall be determined by the Engineer. Stones greater than 300mm in diameter that are removed during excavation shall be disposed of by the Contractor at an offsite location. No additional payment for excavating or hauling these stones will be provided.

420.3.9 Brush, Trees and Debris

Unless stated otherwise in the Special Provisions, the following requirements shall apply for installation of a tile drain in a wooded area. The Contractor will clear and grub a minimum corridor width of 30m centered on the tile drain alignment. The resulting debris shall be placed in a windrow along the edge of the working area. No additional payment will be made for such work.

420.3.10 Subsoil Instability

If poor subsoil conditions are encountered during tile installation by wheel trencher an attempt shall be made to install the tile with a continuous geotextile underlay in the trench bottom. The cost of the underlay, if approved by the Engineer, will be paid as an extra. If the continuous geotextile underlay is not sufficient then the tile will be installed by backhoe or excavator on a bedding of 19mm clear crushed stone (300mm depth) to achieve trench bottom stability for the new tile. If approved, the above work will be paid based on the unit price provided on the Form of Tender. The unit price shall include the cost to supply and place the stone. If more than 300mm depth of stone is required for bottom stability, additional payment will be allowed for the additional depth of stone. The additional quantity of stone shall be supported by weigh tickets and the suppliers invoice.

If poor subsoil conditions are encountered during tile installation by backhoe or excavator, the tile shall be installed on stone bedding as noted above. For this installation only the material cost of the stone will be paid as an extra. Supply of stone and cost to be supported by weigh tickets and supplier's invoice.

If the subsoil is a fine grained soil it may necessary to place the stone on a geotextile with the geotextile wrapped over the stone before laying the tile. Additional payment will be allowed to supply and install the geotextile.

420.3.11 Broken or Damaged Tile

The Contractor shall dispose of all damaged or broken tile and broken tile pieces off-site.

420.3.12 Excess Tile

All excess tile shall be removed from the job site.

420.3.13 Catchbasins

420.3.13.1 General

All catchbasins shall have minimum inside dimensions matching the dimensions shown on the Drawings. Contractor is responsible for ordering catchbasins to match the inlet and outlet connections and top elevations required by the Special Provisions and the Drawings.

420.3.13.2 Materials

Requirements in this section apply to catchbasins in non-travelled locations. Where catchbasins are proposed for travelled locations, refer to the Special Provisions and the Drawings for applicable OPSD information.

Precast concrete catchbasins shall be manufactured by as Coldstream Concrete or approved equal. Minimum wall thickness for catchbasins without reinforcement is 150mm and with reinforcement 100mm. The joints between precast catchbasin sections shall be protected with geotextile to prevent soil material from entering into the catchbasin. Joint protection using mortar or water tight barrier is also acceptable. Grates are to be birdcage grates as manufactured by Coldstream Concrete or approved equal unless specified otherwise on the Drawings. All grates to be secured with corrosion resistant hardware.

HDPE catchbasins shall be as fabricated by ADS, Armtec, Hancor or approved equal. Steel catchbasins shall be the Heavy Duty Steel Catch Basin as manufactured by AgriDrain or approved equal. PVC catchbasins shall be Nyloplast as manufactured by ADS or approved equal. HDPE, steel and PVC catchbasins shall be supplied with integral stubouts fabricated by the manufacturer and sized according to the pipe connections shown on the Drawings. Grates for HDPE, steel or PVC catchbasins shall be in accordance with the Special Provisions and manufacturer recommendations.

Marker stakes as supplied by Coldstream Concrete or equal are to be placed beside each catchbasin unless specified otherwise on the Drawings.

420.3.13.3 Installation

All tile or pipe connected to concrete catchbasins shall be mortared or secured in place so that no gaps remain at the connection. Mortar is to be applied on both the inside and outside wall surfaces.

Backfill around all new catchbasins is recommended to be 19mm clear crushed stone to avoid future settlements. The Contractor shall be responsible for backfilling all settlement areas around catchbasins during the contract warranty period. No additional payment will be provided for adding backfill to settlement areas around catchbasins.

All catchbasin sumps to be fully cleaned by the Contractor after completion of drain installation and backfilling.

420.3.14 Junction Boxes

Junction boxes shall be precast concrete to the same specification as above for catchbasins except that the junction box shall have a solid lid. The lid shall be a minimum of 125mm thick with wire mesh reinforcement and 2 lifting handles. The top of the junction box should have a minimum ground cover of 450mm.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL BE INFORMED OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM

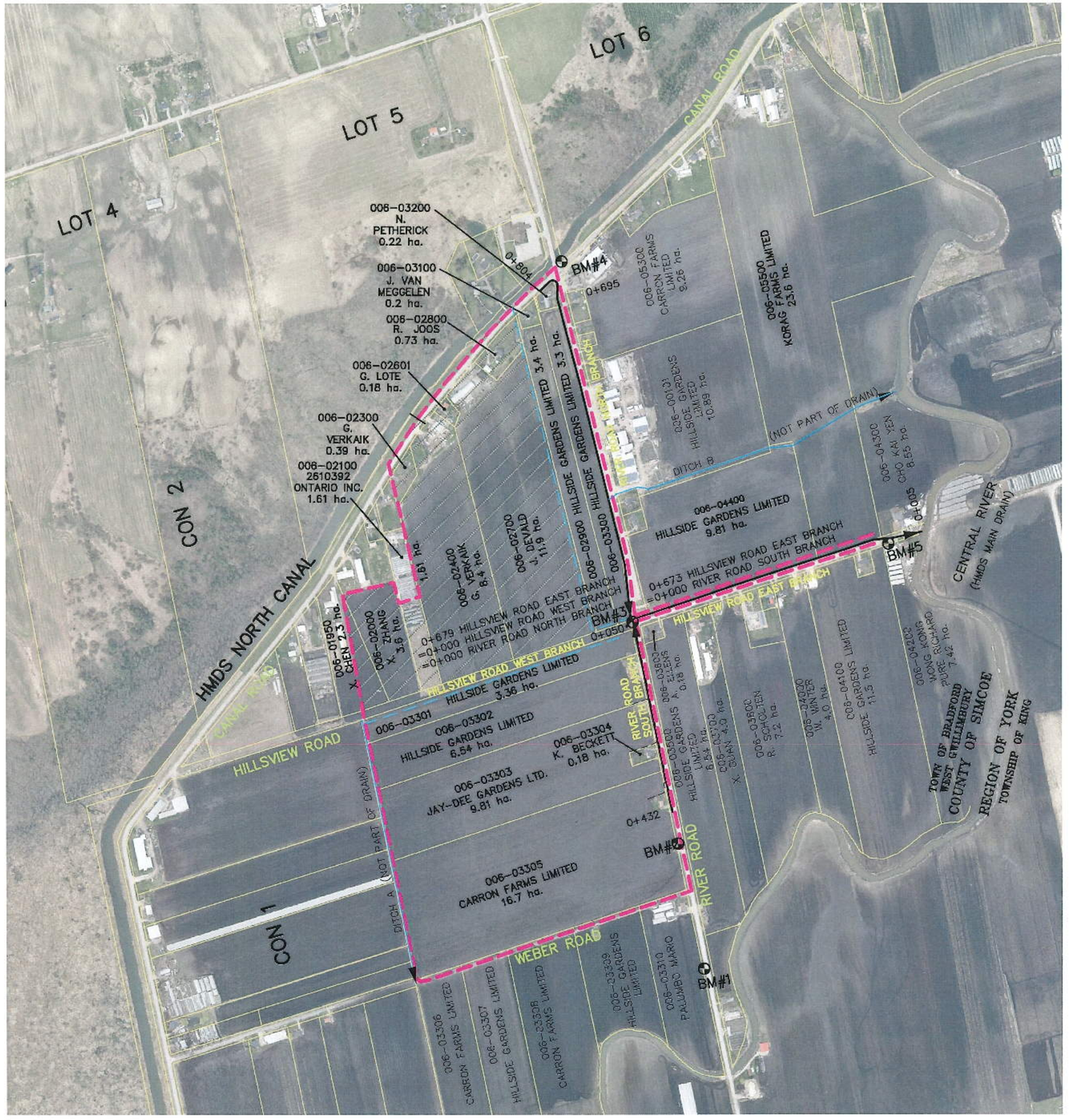
BM#1
SPIKE IN E/SIDE H.P. #BF72FD
WEST SIDE RIVER ROAD
ELEV. 218.107m

BM#2
SPIKE IN W/SIDE HP #BF72KC
WEST SIDE RIVER ROAD
ELEV. 218.617m

BM#3
SPIKE IN NE/SIDE HP #BF42SQ
WEST SIDE RIVER ROAD AT HILLSVIEW ROAD
ELEV. 218.305m

BM#4
CUT CROSS, TOP CAPPED SHEET PILING
NE CORNER INTERSECTION WEST CANAL BANK ROAD AND RIVER ROAD
7.5m OF NORTH END SHEET PILING
ELEV. 221.485m

BM#5
NAIL IN NORTH FACE HP #BF7TUC
SOUTH SIDE HILLSVIEW ROAD
15m WEST OF LANEWAY #123
ELEV. 218.146m



LEGEND

- — — — — — MAJOR WATERSHED
- — — — — — INTERMEDIATE WATERSHED
- ——→ PROPOSED WORK
- **006-03900** — ASSESSMENT ROLL NUMBER
- **5.2 ha.** — HECTARES OWNED
- — THIS AREA IS TILE DRAINED OUT OF THE WATERSHED SHOWN WITH NO ALLOWANCE FOR TILE DRAINAGE OUTLET TO BE ADDED TO THIS NEW DRAIN
- **BM#1** — BENCHMARK LOCATION AND NUMBER
- **HMDS** — HOLLAND MARSH DRAINAGE SYSTEM

NOTE:
LAND OWNER NAMES THAT ARE IN DARKER PRINT ARE THOSE AFFECTED BY THE PROJECT

DESIGNED BY: K.A.S.	LICENSED PROFESSIONAL ENGINEER K.A. SMART 42094012 PROVINCE OF ONTARIO	SCALE 0 100 200m (1:10,000 ON 11"x17")
DRAWN BY: N.M.B.		
CHECKED BY: K.A.S.		

RIVER ROAD DRAIN

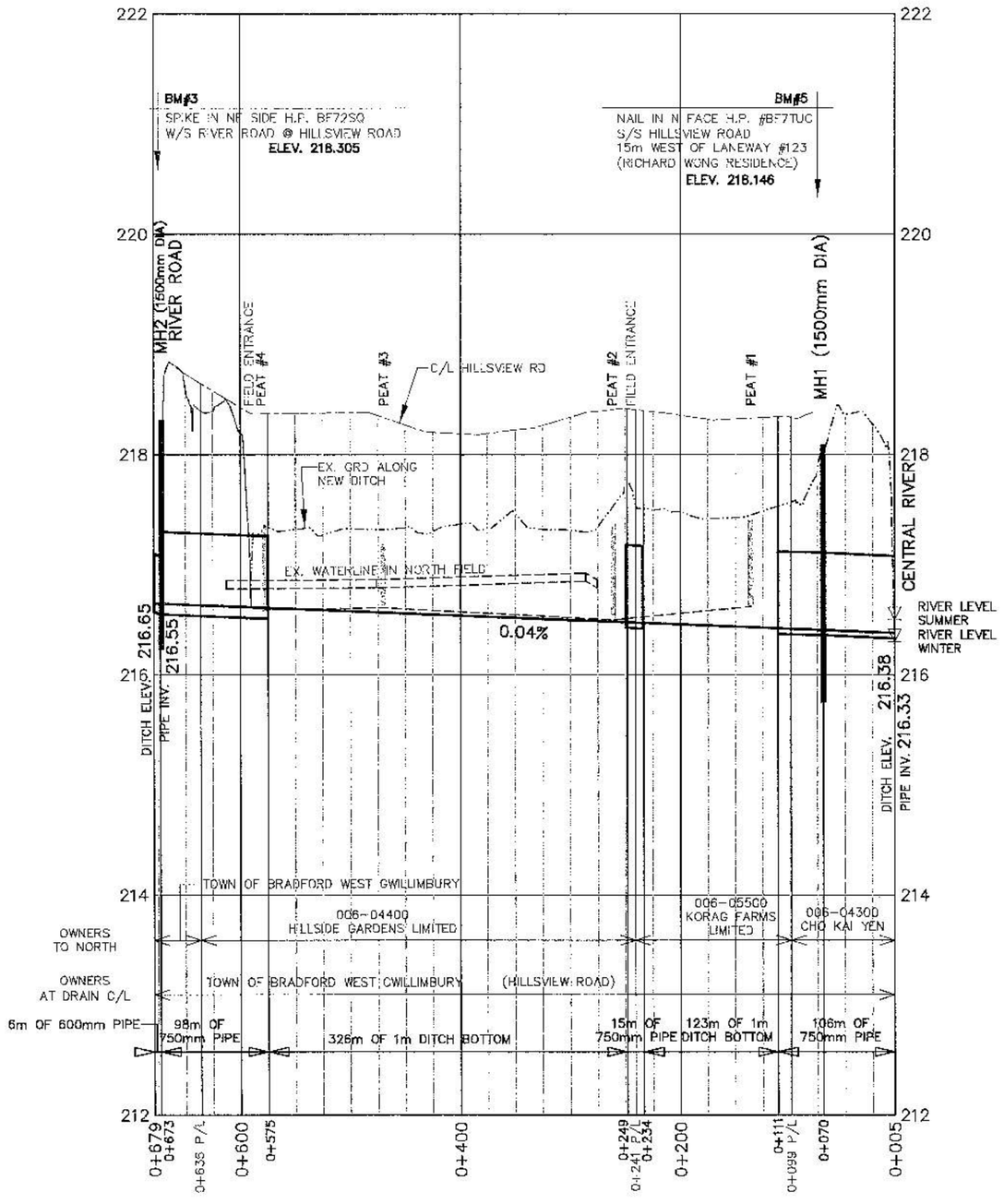
COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

WATERSHED PLAN — SEPT. 18, 2020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

REVISED:
JOB NUMBER: **19-034**
DRAWING 1 OF 34

\\server\ksdata\Data\2019\19-034\Drafting\WS 19-034.dwg WS PLAN 17-Sep-20 12:51:58 PM



HILLSVIEW ROAD EAST BRANCH

LEGEND

- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED CHANNEL BOTTOM (BETWEEN PIPE/CULVERT)
- PROPOSED PIPE/CULVERT
- PEAT #4 — PEAT TEST HOLE NUMBER AND LOCATION

NOTES:
ELEVATIONS ARE FOR GRADE LINE (DITCH WHERE IT IS TO BE DONE)

CULVERTS/PIPES ARE TO BE RECESSED BY 50 TO 100MM BELOW GRADE LINE AS NOTED

ALL PIPE ON THIS PROJECT IS TO BE SMOOTH WALL HDPE PIPE

DESIGNED BY: H.A.W.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER K.A. SMART 2991012 PROVINCE OF ONTARIO

0 50 100m (SCALE 1 : 5000) HORZ.
0 0.5 1m (SCALE 1 : 50) VERT.
SCALE (ON 11x17)

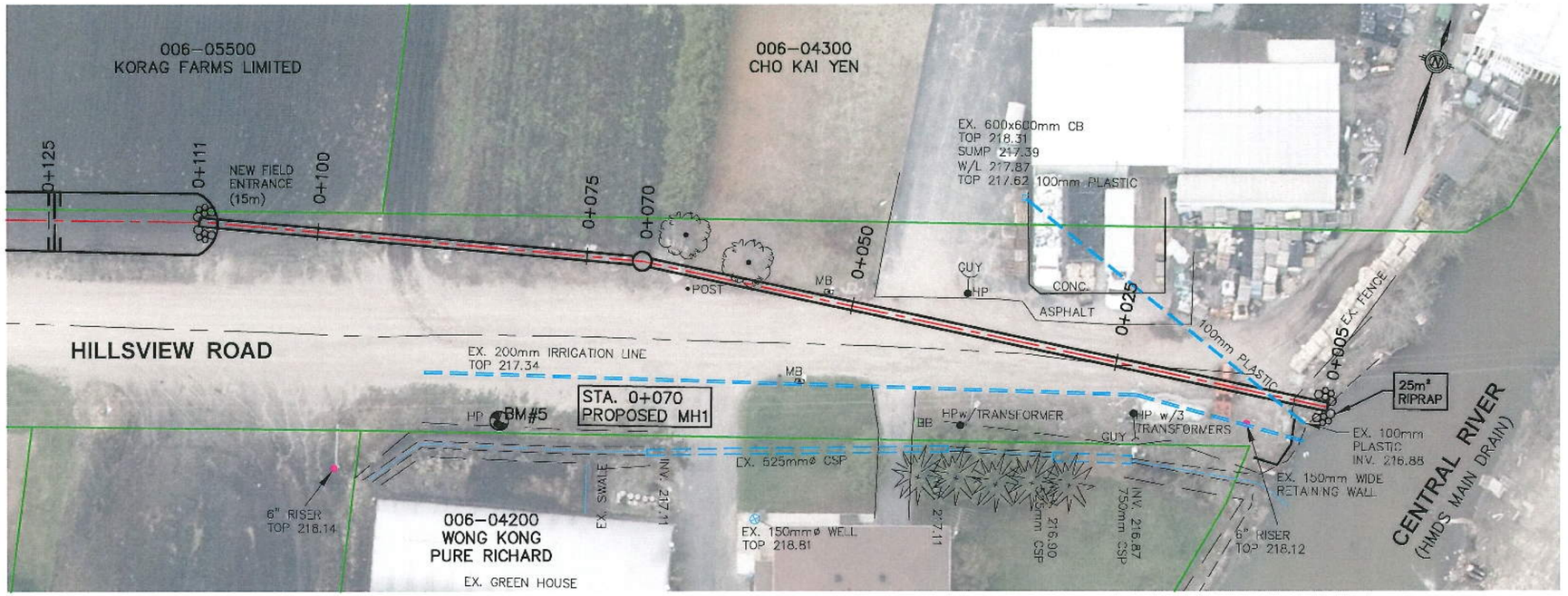
RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH PROFILE — SEPT. 18, 2020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

REVISED:
Job NUMBER: 19-034
DRAWING 2 OF 34

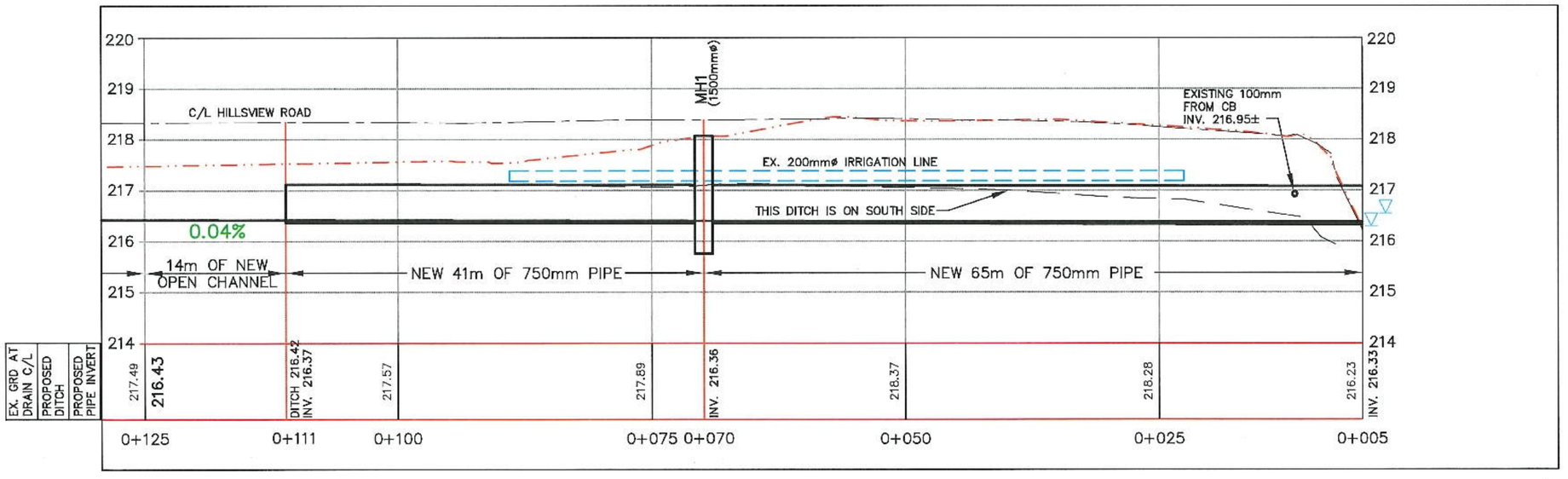


BM#5
NAIL IN N FACE H.P. #BF7TUC S/S HILLSVIEW ROAD
15m WEST OF LANEWAY #123
(RICHARD WONG RESIDENCE)
ELEV. 218.146

STA. 0+070
PROPOSED MH1 1500mm DIA.
TOP 218.07
E INV. 216.36 (750mm)
W INV. 216.36 (750mm)
SUMP 215.76

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING DITCH (PROFILE) (WHERE THERE IS ONE)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN (PLAN)
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED MANHOLE
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH
- RIPRAP



MISCELLANEOUS:
100mm PLASTIC DRAIN
AT STA. 0+013 TO BE RELAID ABOVE NEW PIPE
OR TO BE REPLACED PARALLEL TO PIPE TO OUTLET
ALONG NORTH SIDE OF NEW PIPE

NOTES:
DITCH GRADES ARE SHOWN THROUGH
CULVERTS/PIPES FOR INFORMATION ONLY
TYPICAL ALL DRAWINGS

ALL PIPE TO BE SMOOTH WALL HDPE

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH
STA. 0+005 TO 0+125

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER — K.A. SMART — 43894012 — PROVINCE OF ONTARIO

0 5 10m (SCALE 1 : 500) HORZ.
0 1.0 2m (SCALE 1 : 100) VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034
3 OF 34

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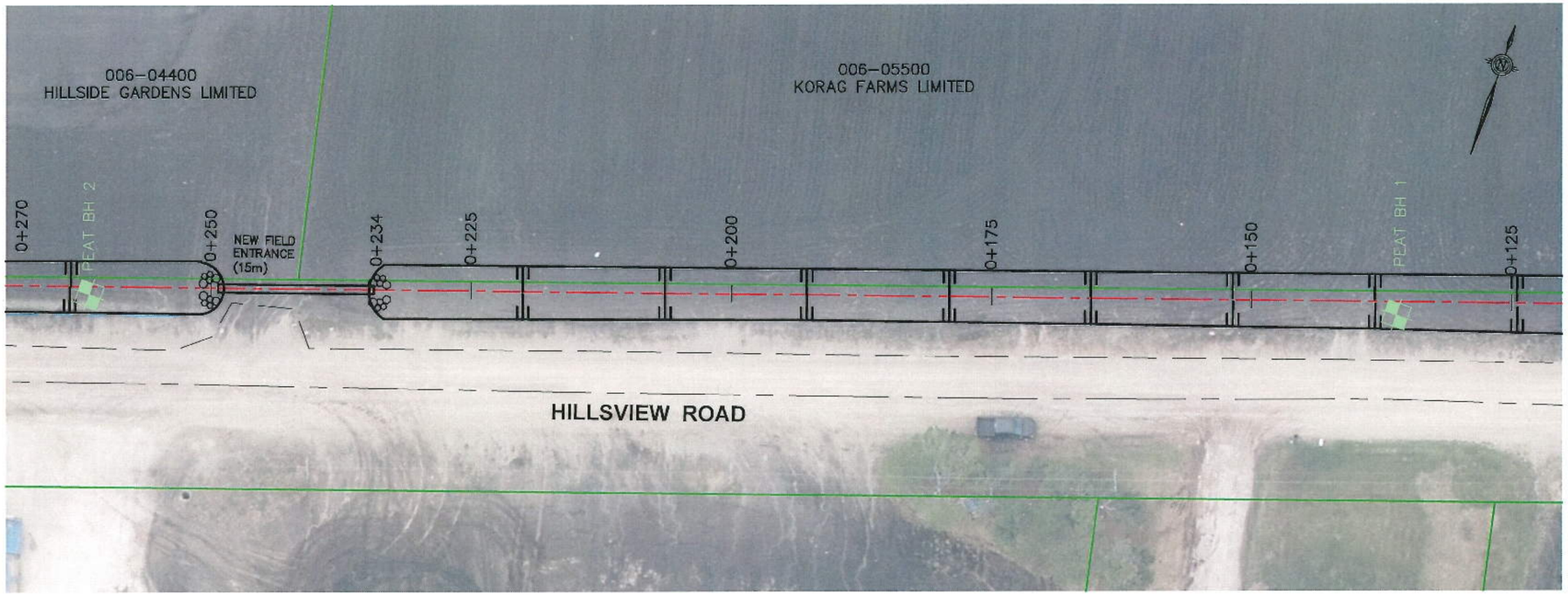

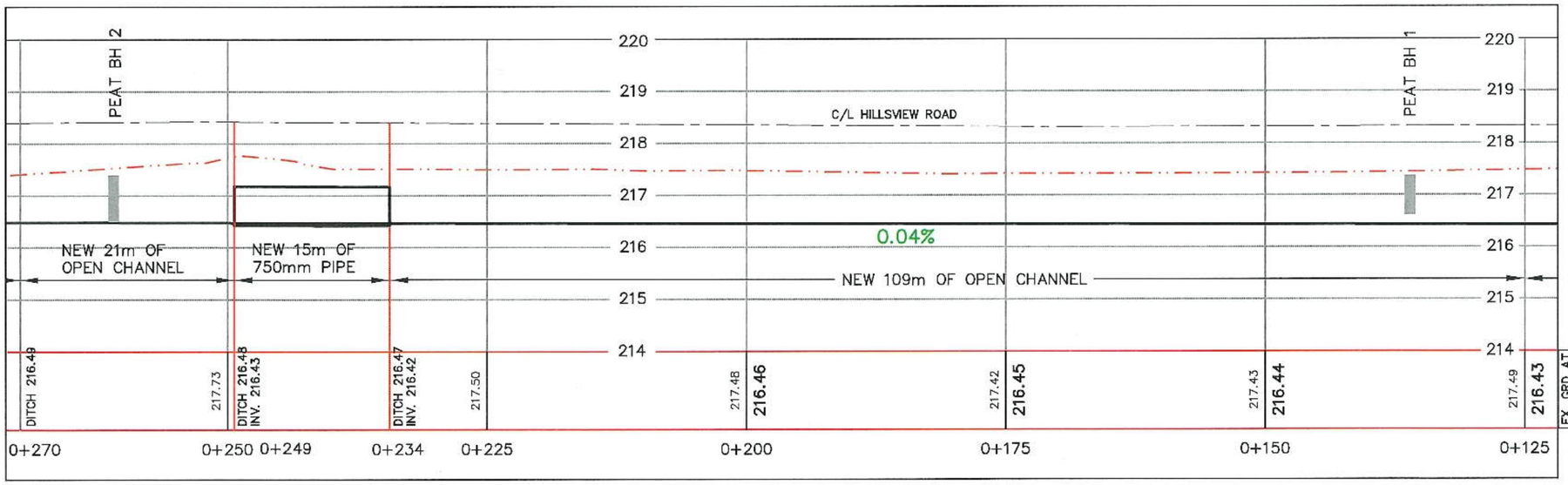

LEGEND

- PROPERTY LINE (PLAN)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN (PLAN)
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH
- RIPRAP

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42994012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH
STA. 0+125 TO 0+270

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034

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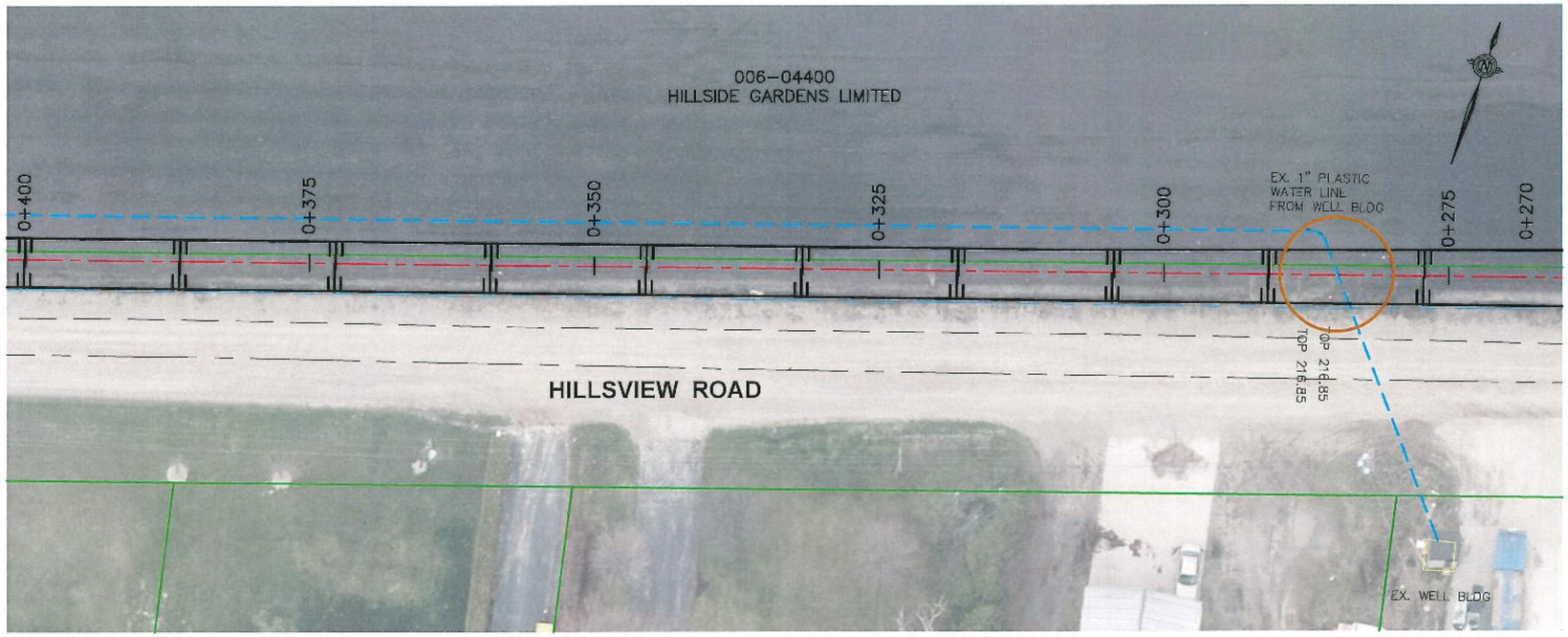
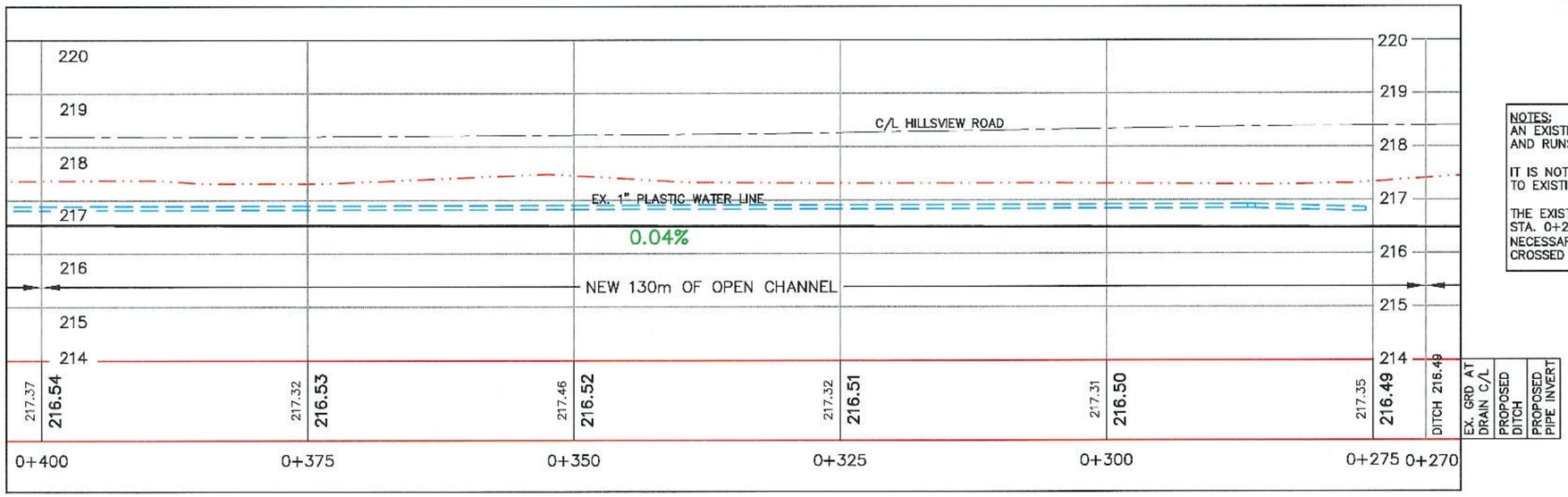


LEGEND

- PROPERTY LINE (PLAN)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN (PLAN)
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED DITCH



NOTES:
AN EXISTING DITCH WITH BERM STARTS AT STA. 0+285± AND RUNS FROM EAST TO WEST TO STA. 0+590±

IT IS NOT PLOTTED SINCE IT'S ELEVATION IS SIMILAR TO EXISTING FIELD LEVEL

THE EXISTING 1" (25mm) WATERLINE WILL BE CROSSED AT STA. 0+285 AND STA. 0+425± AND WORK WILL BE NECESSARY TO REPLACE AND/OR LOWER THE LINE WHERE CROSSED

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42994012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH
STA. 0+270 TO 0+400

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034

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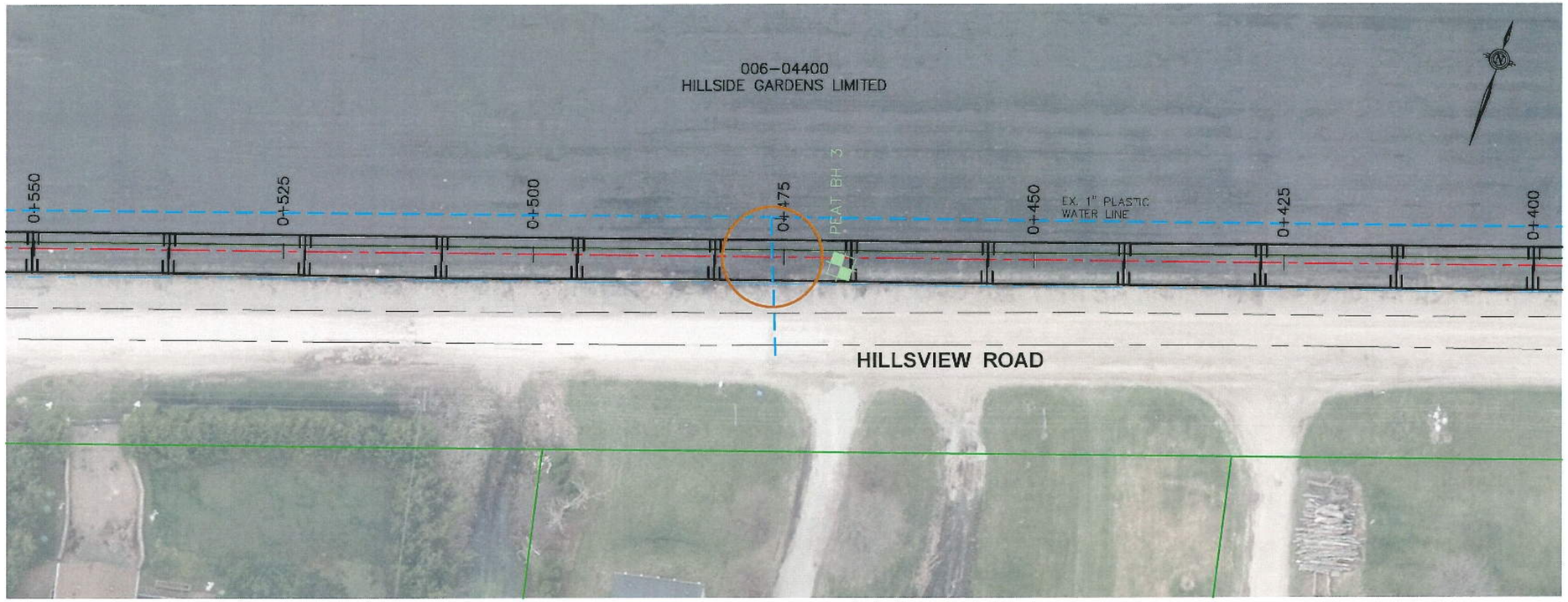

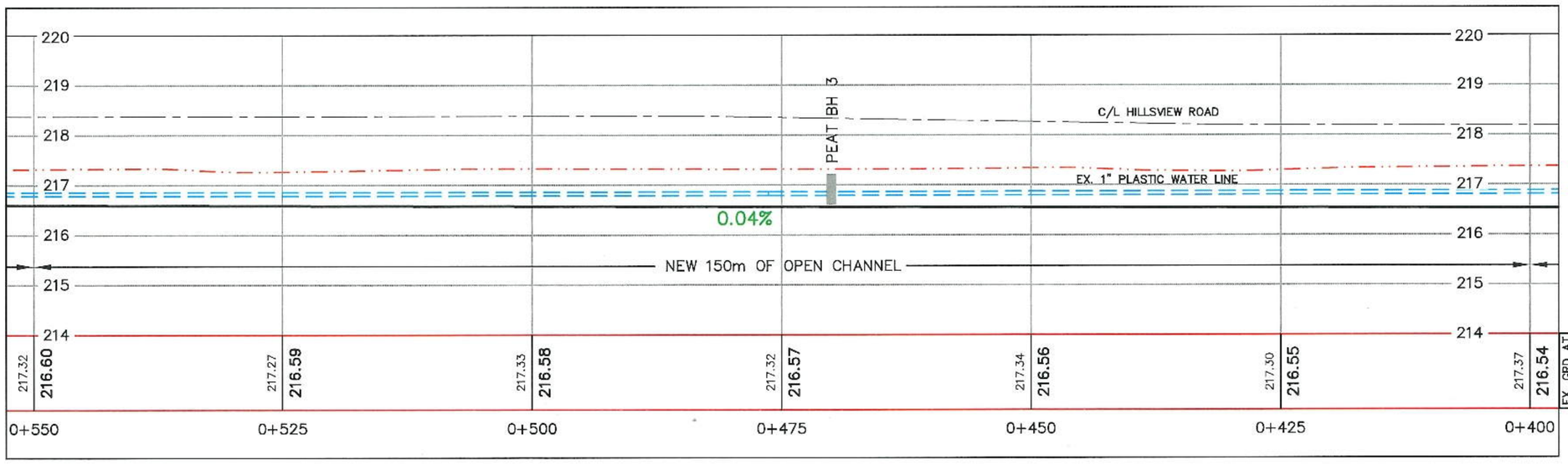

LEGEND

- PROPERTY LINE
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH

NOTES:
AN EXISTING DITCH WITH BERM STARTS AT STA. 0+285± AND RUNS FROM EAST TO WEST TO STA. 0+590±

IT IS NOT PLOTTED SINCE IT'S ELEVATION IS SIMILAR TO EXISTING FIELD LEVEL

THE EXISTING 1" (25mm) WATERLINE WILL BE CROSSED AT STA. 0+285 AND STA. 0+425± AND WORK WILL BE NECESSARY TO REPLACE AND/OR LOWER THE LINE WHERE CROSSED

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42991012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH
STA. 0+400 TO 0+550

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034
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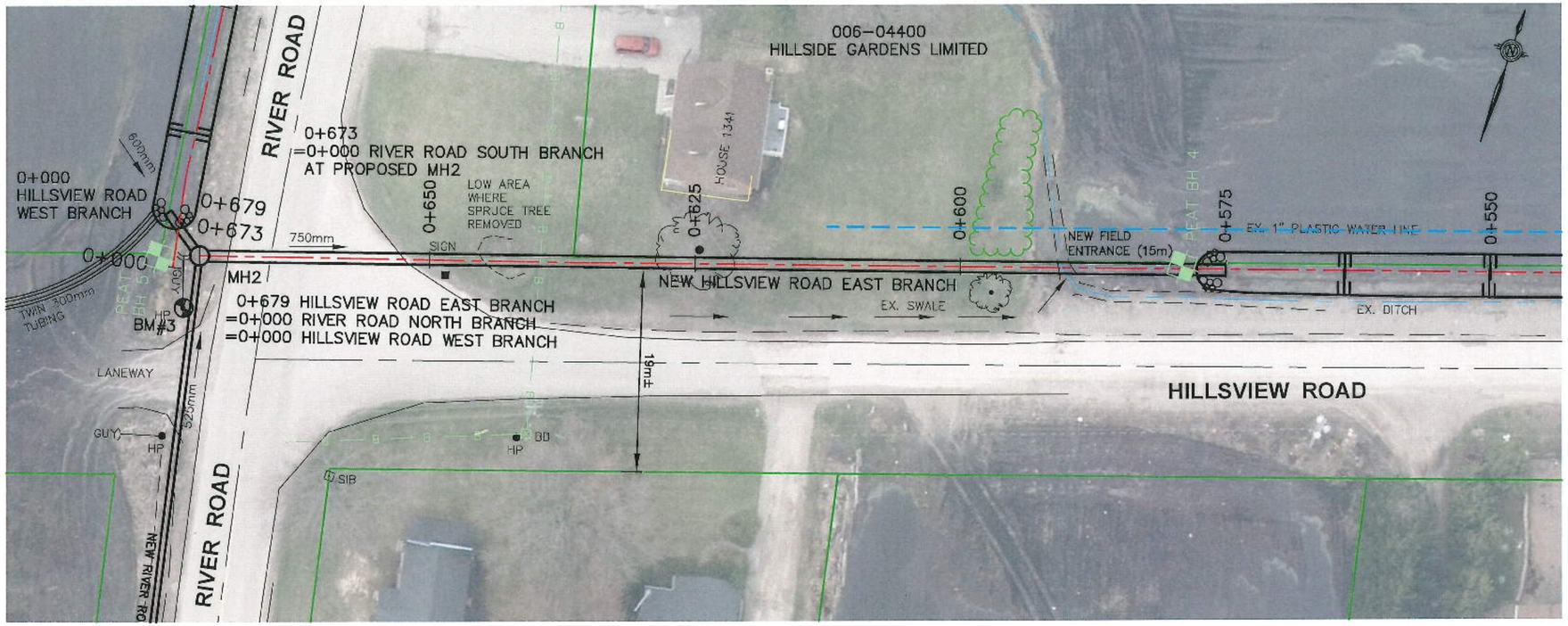
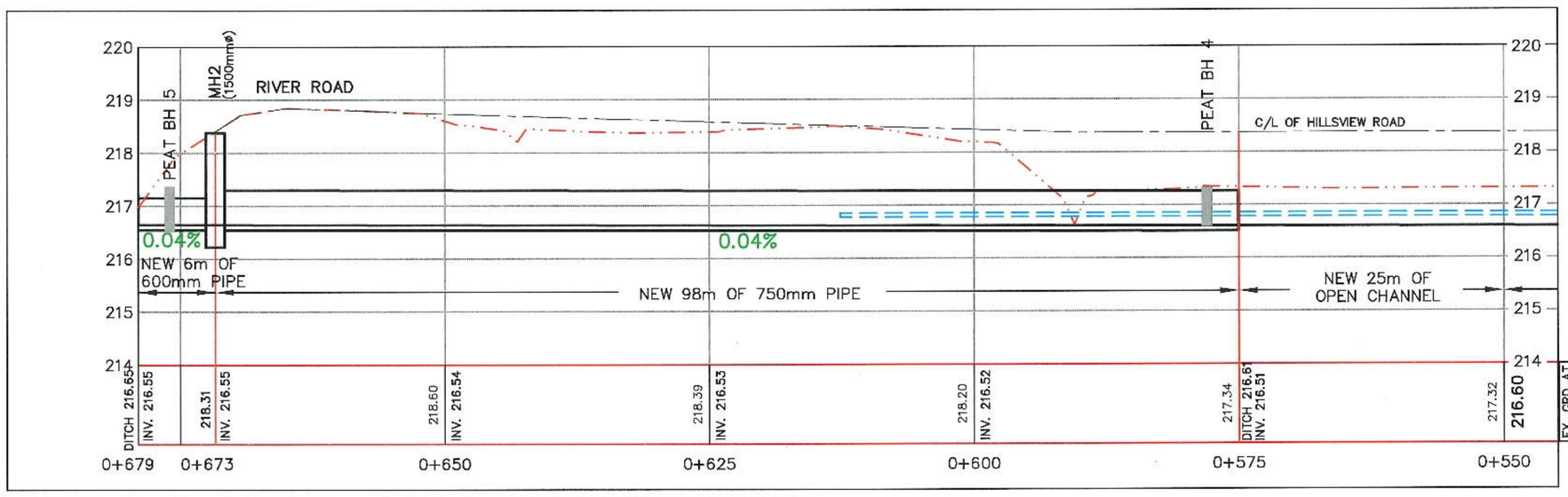


BM#3
SPIKE IN NE/SIDE HP #BF42SQ
W/SIDE RIVER ROAD AT HILLSVIEW ROAD
ELEV. 218.305

STA. 0+673
PROPOSED MH2 1500mm DIA
TOP 218.31
E INV. 216.55 750mm
S INV. 216.55 525mm
W INV. 216.55 600mm
SUMP 216.25



LEGEND
- PROPERTY LINE
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED MANHOLE
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH

NOTES:
AN EXISTING DITCH WITH BERM STARTS AT STA. 0+285± AND RUNS FROM EAST TO WEST TO STA. 0+590±

IT IS NOT PLOTTED SINCE IT'S ELEVATION IS SIMILAR TO EXISTING FIELD LEVEL

THE EXISTING 1" (25mm) WATERLINE WILL BE CROSSED AT STA. 0+285 AND STA. 0+425± AND WORK WILL BE NECESSARY TO REPLACE AND/OR LOWER THE LINE WHERE CROSSED

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER K.A. SMART 43994012 PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500) HORZ.
0 1.0 2m
(SCALE 1 : 100) VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH
STA. 0+550 TO 0+675

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034
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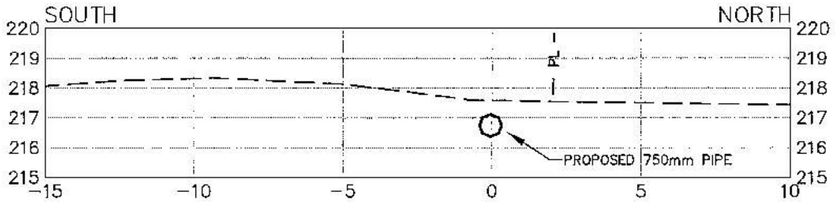
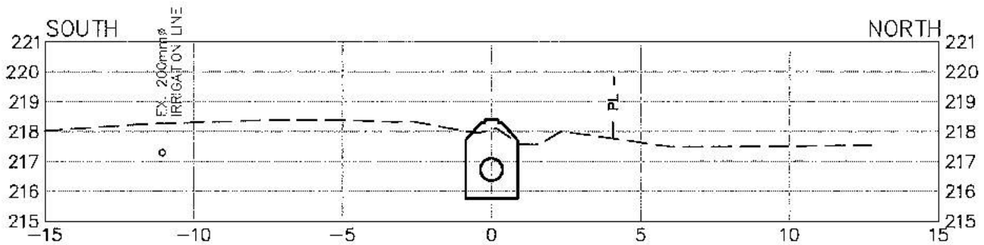
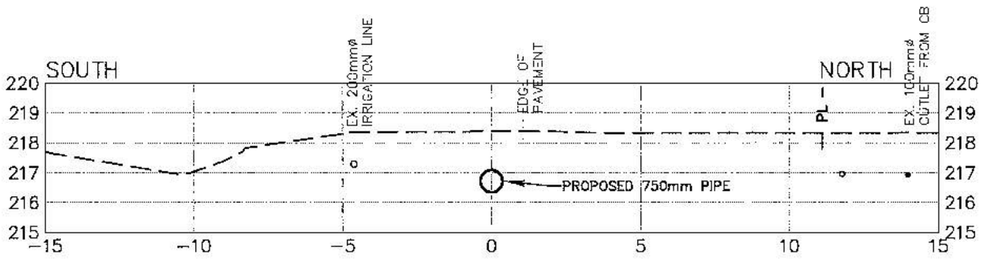


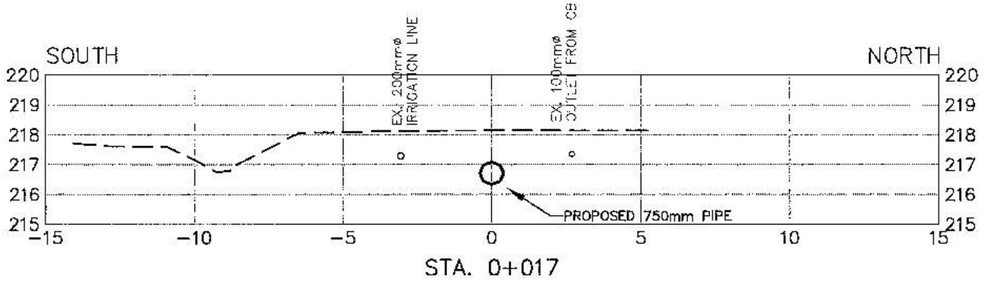
STA. 0+097±



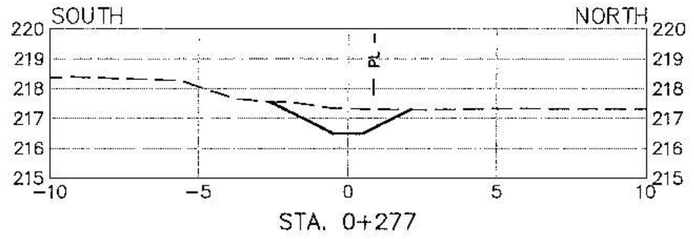
STA. 0+070



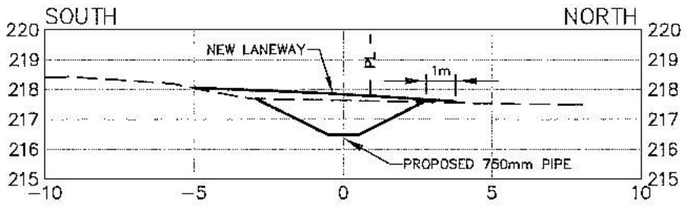
STA. 0+034



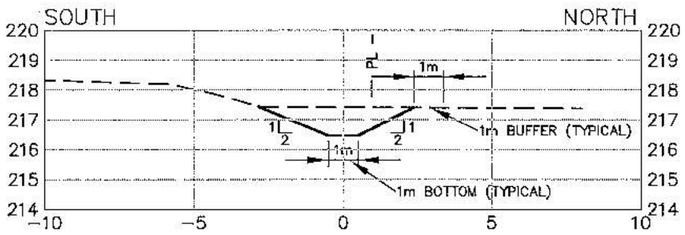
STA. 0+017



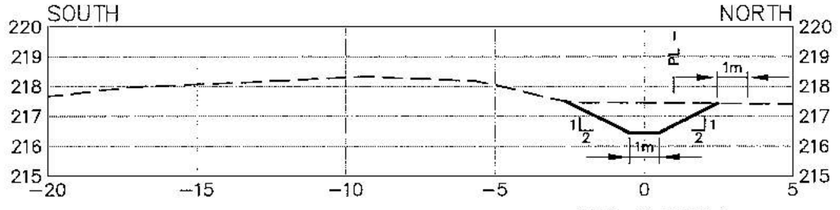
STA. 0+277



STA. 0+252



STA. 0+173



STA. 0+138±

NOTE:
DITCH IS 1m BOTTOM, 2:1 SIDE SLOPES (MINIMUM) THROUGHOUT

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

K.A. SMART 90994012 LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

0 2 4m
(SCALE 1 : 200)
HOR.
0 2 4m
(SCALE 1 : 200)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH
CROSS SECTIONS

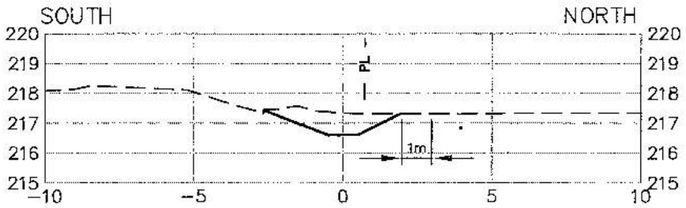
SEPT. 18, 2020

REVISED:

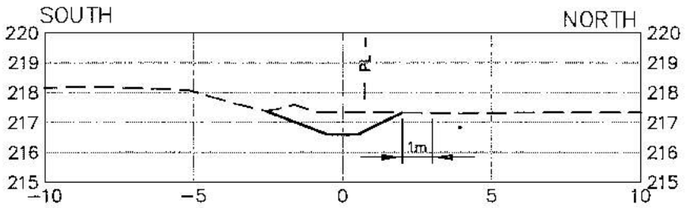
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

JOB NUMBER: 19-034

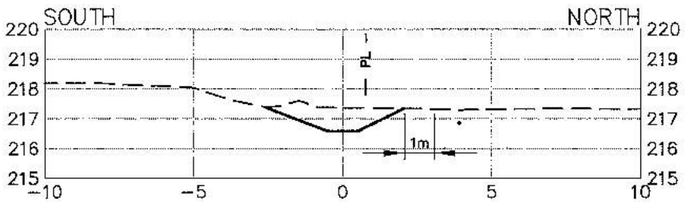
DRAWING
8 OF 34



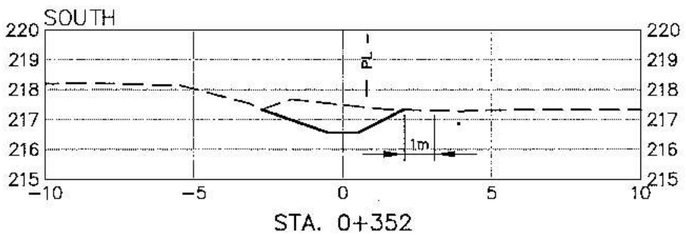
STA. 0+446



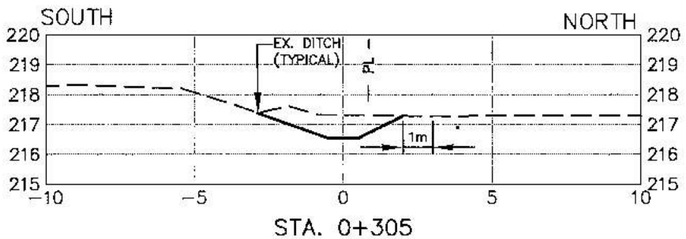
STA. 0+417



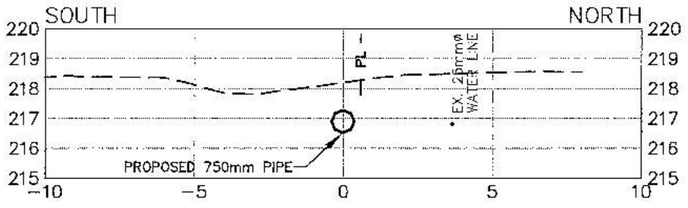
STA. 0+389



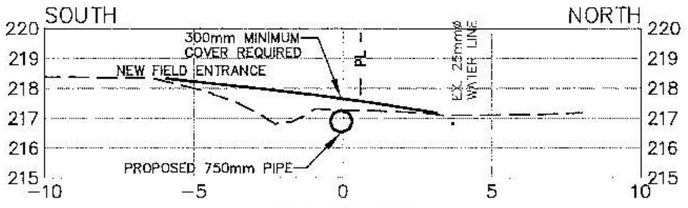
STA. 0+352



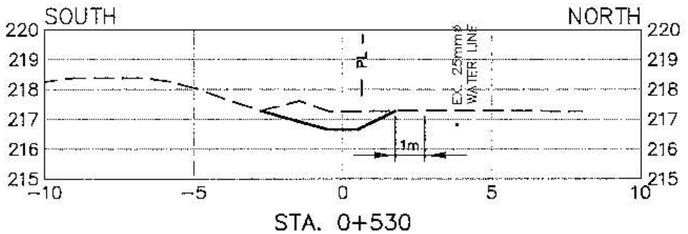
STA. 0+305



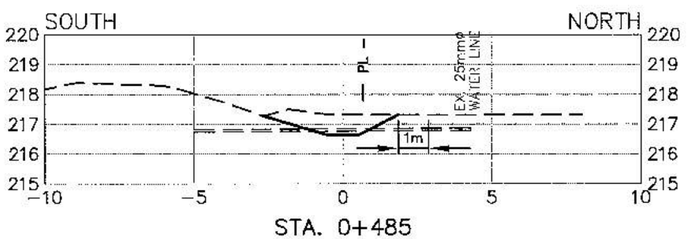
STA. 0+600



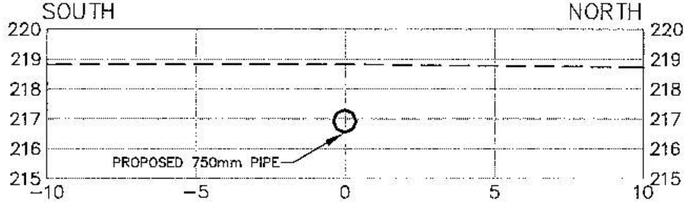
STA. 0+588



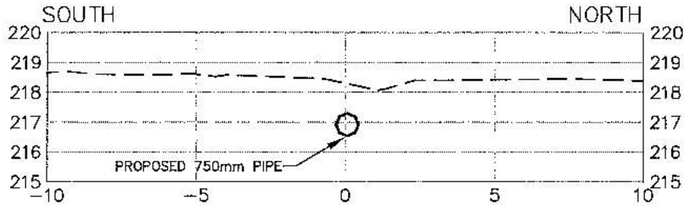
STA. 0+530



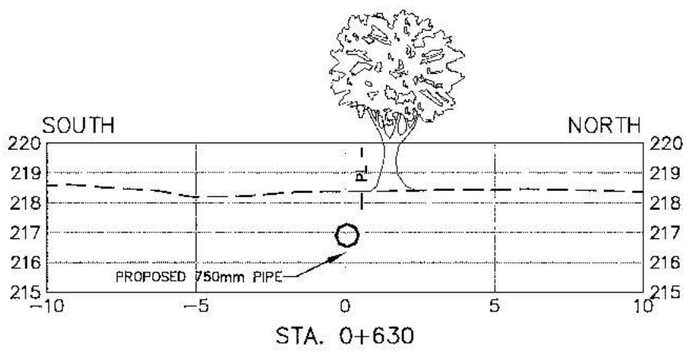
STA. 0+485



STA. 0+666



STA. 0+644



STA. 0+630

NOTE:
DITCH IS 1m BOTTOM, 2:1 SIDE SLOPES (MINIMUM) THROUGHOUT

DESIGNED BY: K.A.S.	
DRAWN BY: N.M.B.	
CHECKED BY: K.A.S.	

LICENSED PROFESSIONAL ENGINEER K.A. SMART 42934012 PROVINCE OF ONTARIO

0 2 4m
(SCALE 1 : 200) HORZ.
0 2 4m
(SCALE 1 : 200) VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

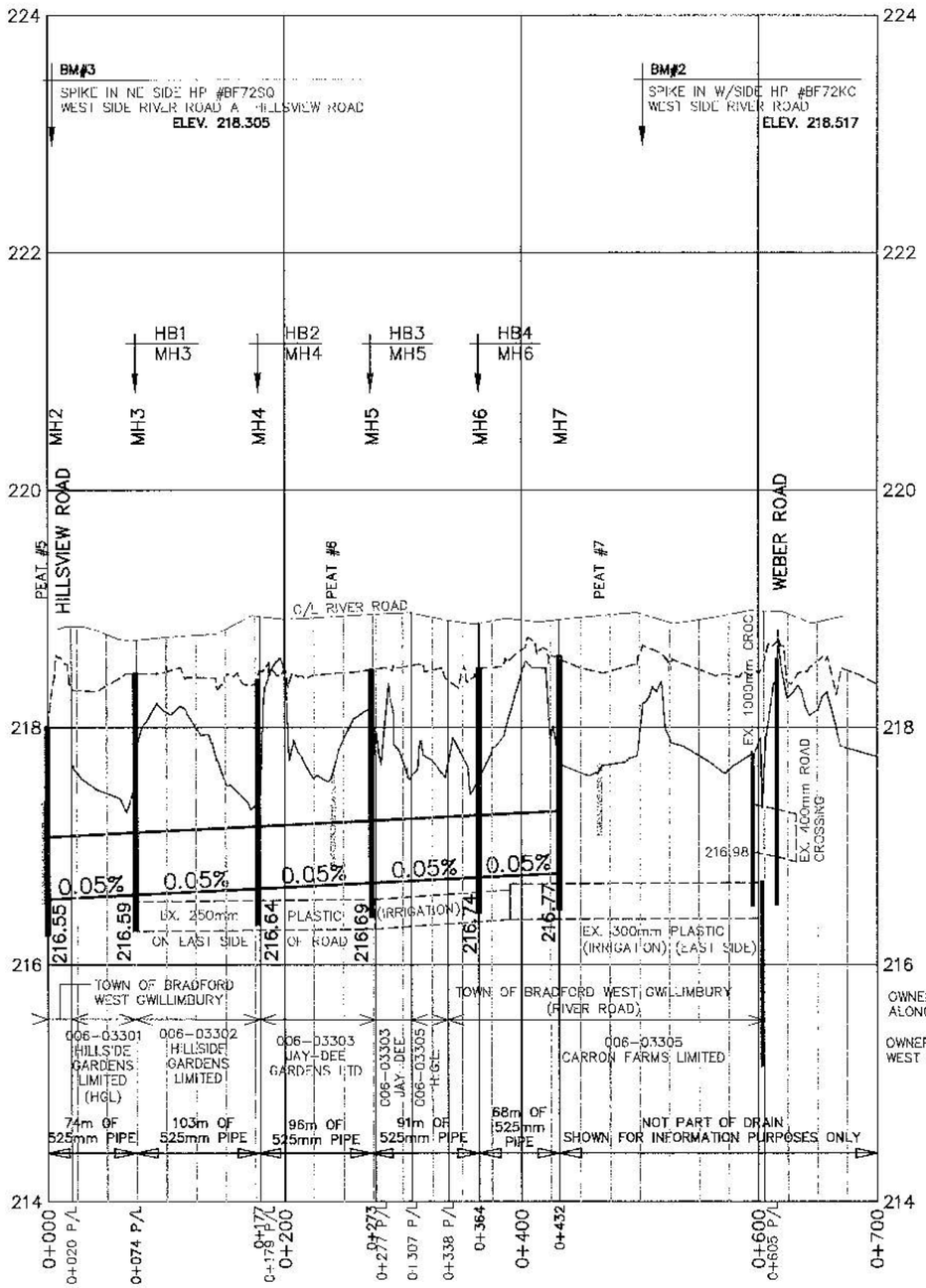
COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD EAST BRANCH
CROSS SECTIONS

SEPT. 18, 2020

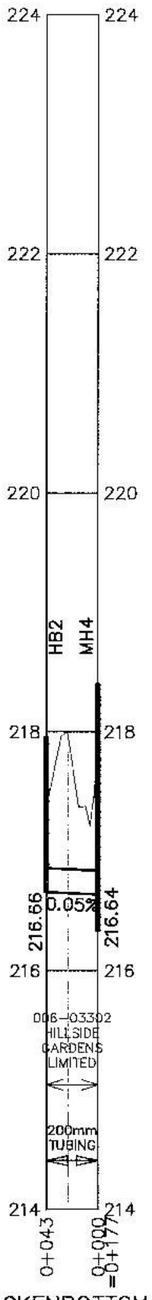
K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

REVISED:
JOB NUMBER: 19-034
DRAWING
9 OF 34



RIVER ROAD SOUTH BRANCH

HICKENBOTTOM BRANCH 1 (HB1)



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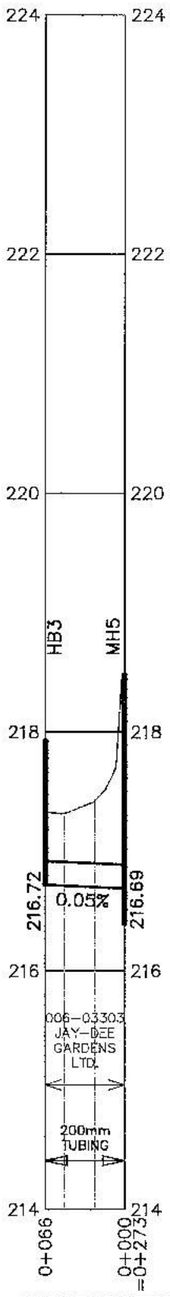
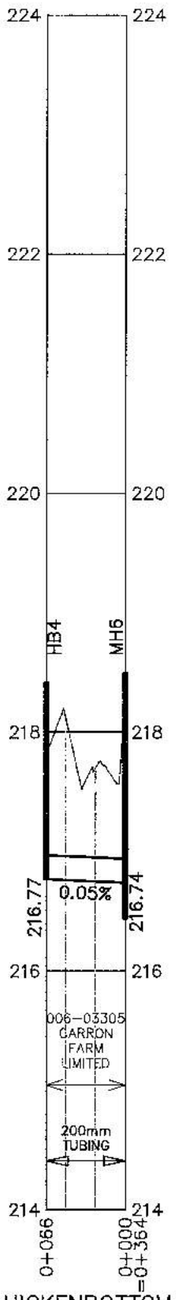


HICKENBOTTOM BRANCH 3 (HB3)



HICKENBOTTOM BRANCH 4 (HB4)

LEGEND

- CENTRE LINE OF ROAD
- EXISTING GROUND ABOVE DRAIN
- EXISTING FIELD LEVEL
- PIPE INVERT AND OBVERT
- MAINTENANCE HOLE
- PEAT #5 — PEAT TEST HOLE NUMBER AND LOCATION
- HB — HICKENBOTTOM

NOTES:
ALL MAINTENANCE HOLES ON THS BRANCH ARE 900x1200mm CB's, WITH BIRDCAGE GRATES

KEEP GROUND ELEVATION AT NEW HICKENBOTTOM EQUAL TO NEARBY LOW FIELD ELEVATION

AT TIME OF CONSTRUCTION ENGINEER WILL RE SURVEY EACH HICKENBOTTOM BRANCH TO CONFIRM GRADES SHOWN

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER K.A. SMART 42694012 PROVINCE OF ONTARIO

0 50 100m (SCALE 1 : 2000) HORZ.
0 0.5 1m (SCALE 1 : 50) VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

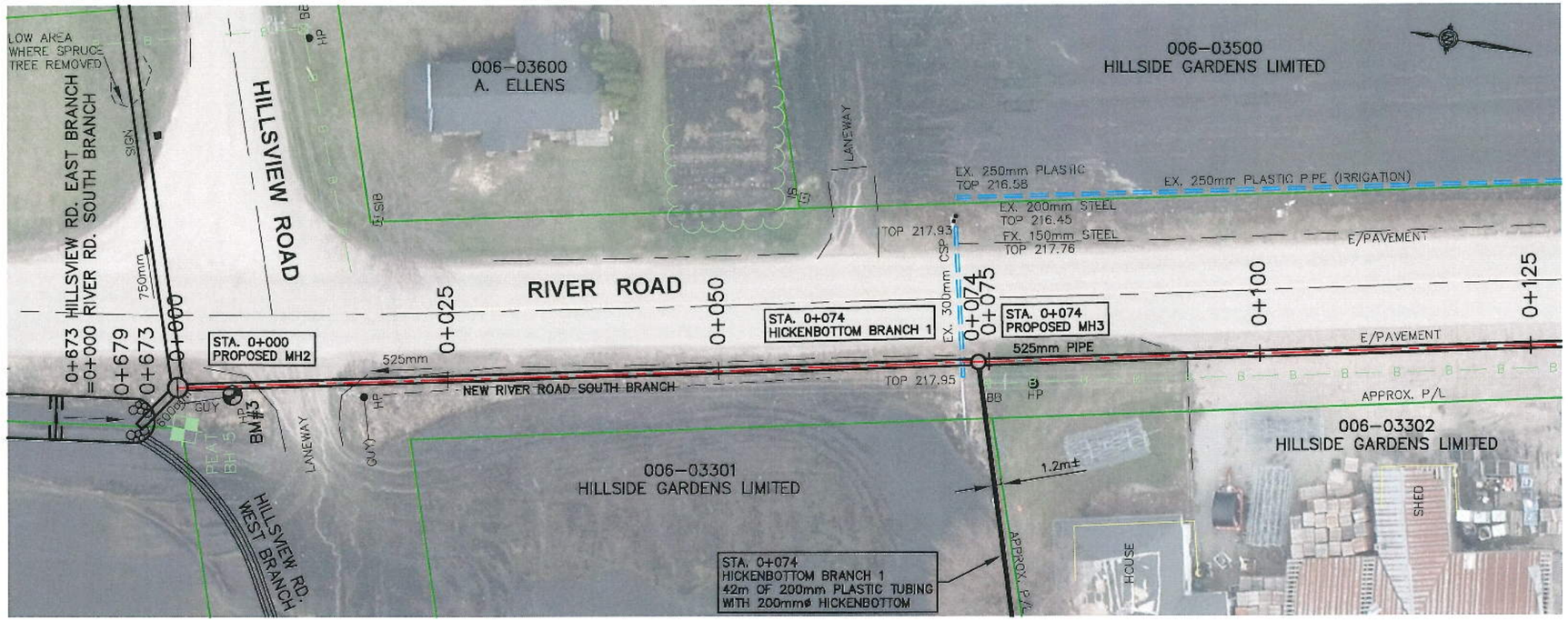
COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH
HICKENBOTTOM BRANCHES

SEPT. 18, 2020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER BARRIE

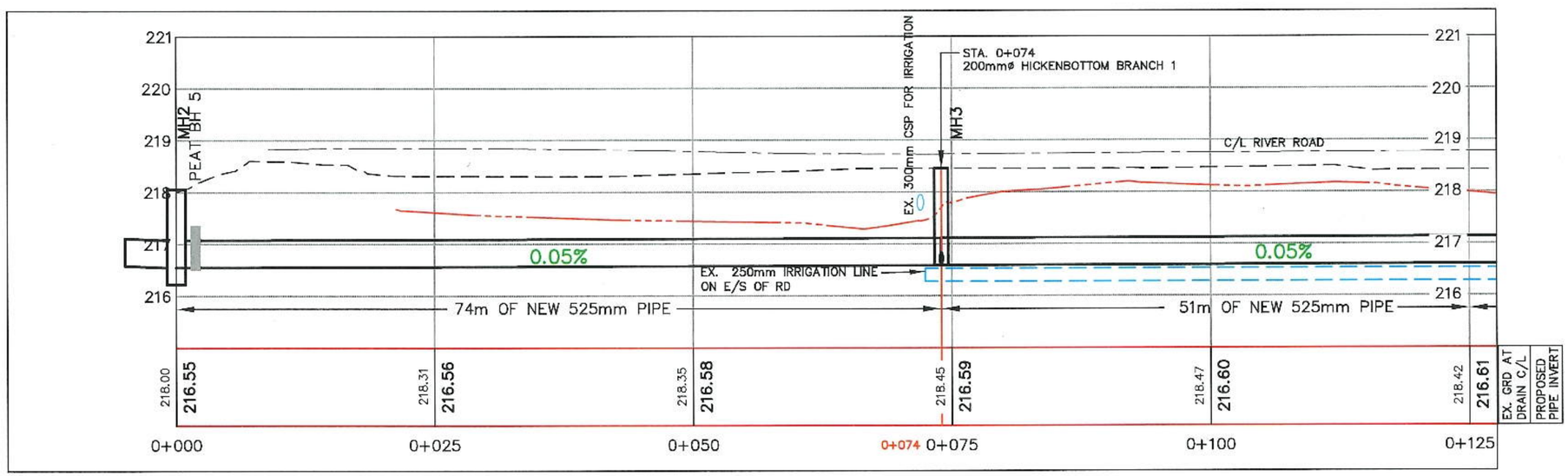
REVISED:
JOB NUMBER: 19-034
DRAWING 10 OF 34



BM#3
SPIKE IN NE SIDE H.P. #BF42SQ
WEST SIDE RIVER ROAD AT HILLSVIEW ROAD
ELEV. 218.305

STA. 0+000 RIVER RD SOUTH BRANCH
PROPOSED MH2 1500mm DIA
TOP 218.31
E INV. 216.55 750mm
S INV. 216.55 525mm
W INV. 216.55 600mm
SUMP 216.25

STA. 0+074
PROPOSED MH3 900x1200mm CB
TOP 218.45
S INV. 216.59 IN 525mm
N INV. 216.59 OUT 525mm
W INV. 216.59 IN 200mm
SUMP 216.29



LEGEND

- PROPERTY LINE (PLAN)
- EXISTING GROUND ABOVE DRAIN
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN (PLAN)
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED PIPE/CULVERT
- PROPOSED MANHOLE (PLAN)
- RIPRAP

NOTES:
PIPE CENTRELINE TO BE SET DESIRABLY TO BE 2m EAST OF POLES MINIMUM AND 1.7m WEST MINIMUM FROM EDGE OF ROAD

PEAT BAND IS SHOWN WHERE SURVEYED

SEE DRAWING 10 FOR PROFILES OF HICKENBOTTOM BRANCHES

MH3, MH4, MH5 , MH6 AND MH7 ARE 900x1200mm CB's WITH BIRDCAGE GRATES

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
43994012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11"x17")

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH STA. 0+000 TO 0+125

SEPT. 18, 2020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

JOB NUMBER: 19-034

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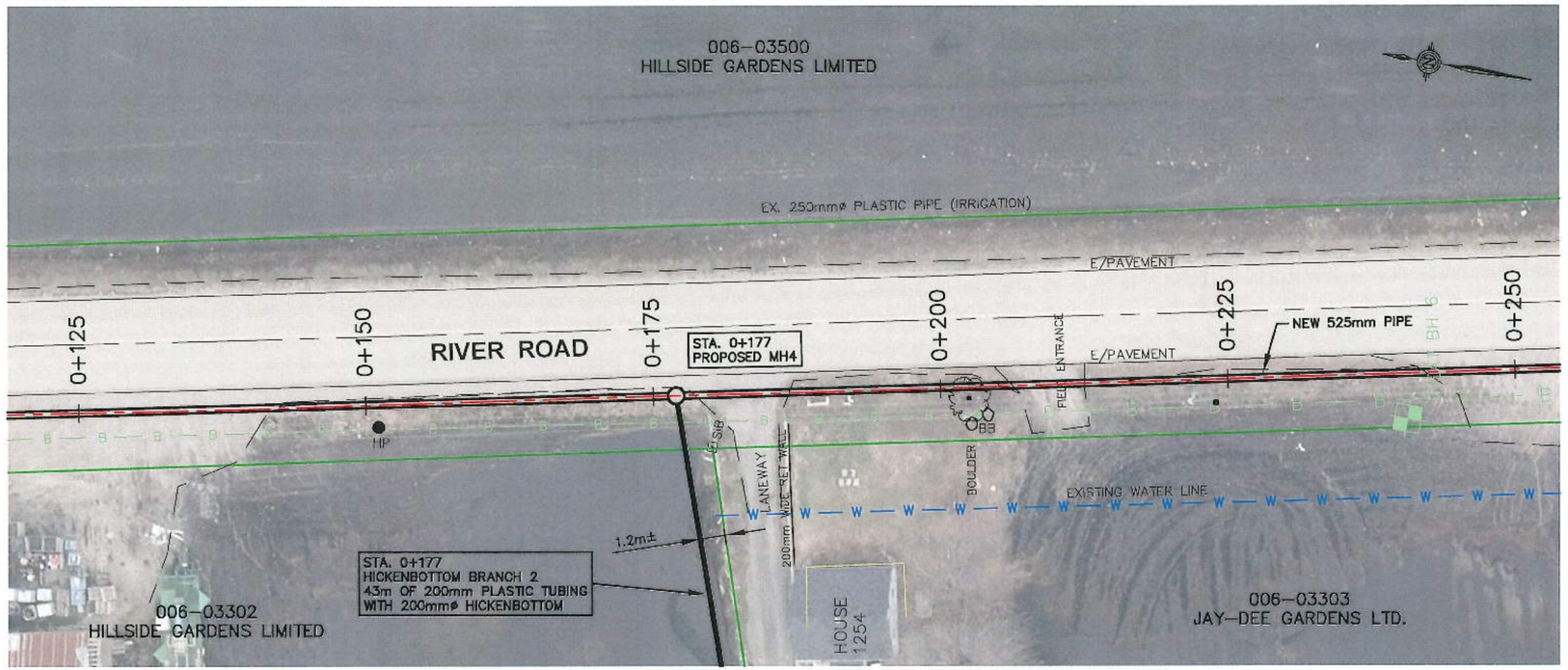
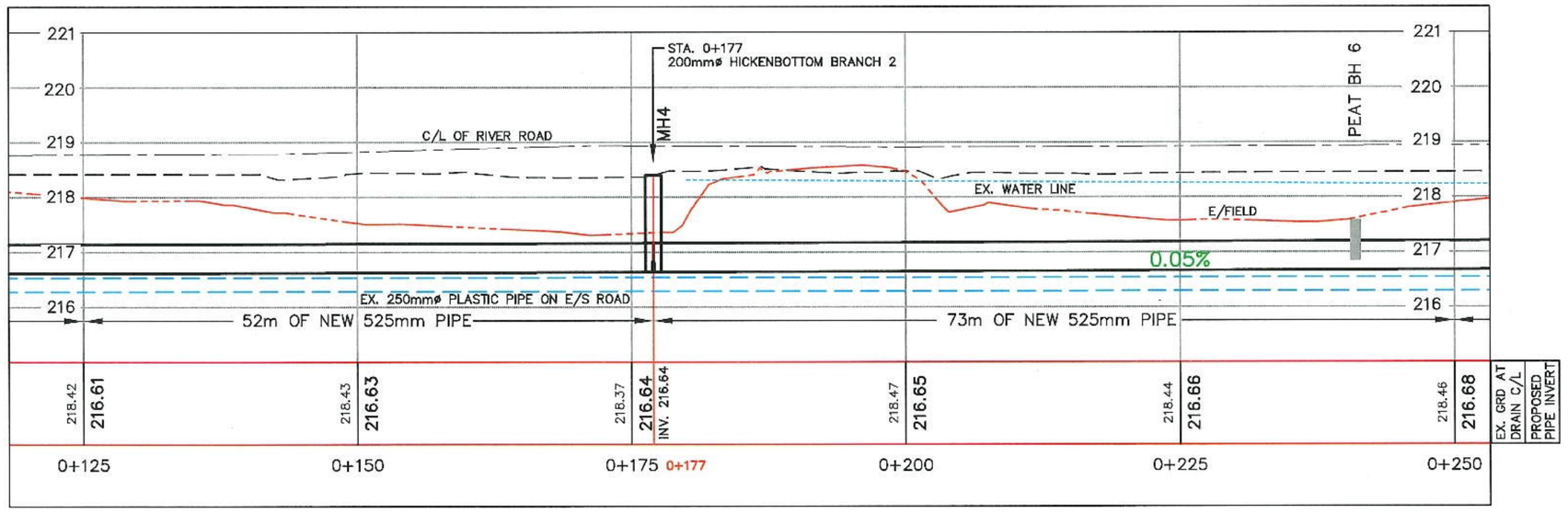


STA. 0+177
PROPOSED MH4 900x1200mm CB
TOP 218.37
S INV. 216.64 IN 525mm
N INV. 216.64 OUT 525mm
W INV. 216.64 IN 200mm
SUMP 216.34

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING GROUND ABOVE DRAIN
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN (PLAN)
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED PIPE/CULVERT
- PROPOSED MANHOLE (PLAN)



NOTES:
PIPE CENTRELINE TO BE SET DESIRABLY TO BE 2m EAST OF POLES MINIMUM AND 1.7m WEST MINIMUM FROM EDGE OF ROAD

PEAT BAND IS SHOWN WHERE SURVEYED

SEE DRAWING 10 FOR PROFILES OF HICKENBOTTOM BRANCHES

MH3, MH4, MH5 , MH6 AND MH7 ARE 900x1200mm CB's WITH BIRDCAGE GRATES

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K. A. SMART
42304012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH STA. 0+125 TO 0+250

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034
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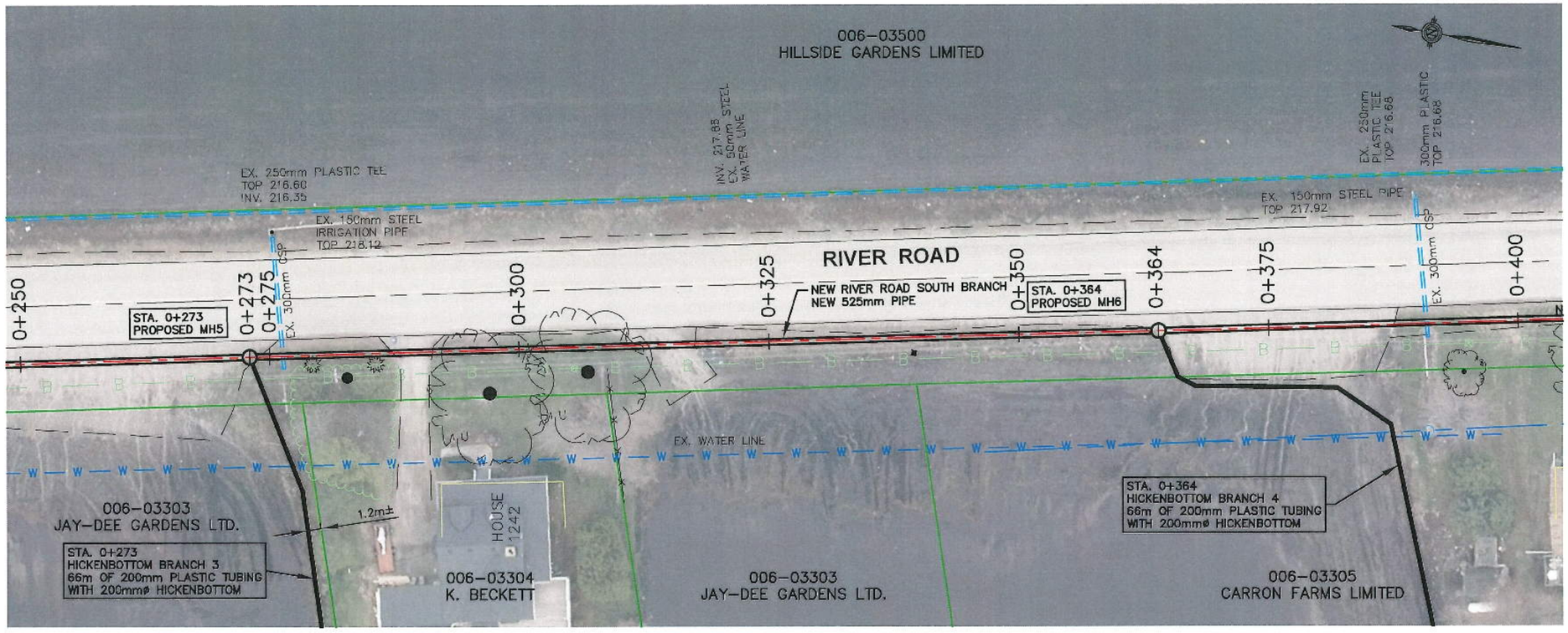
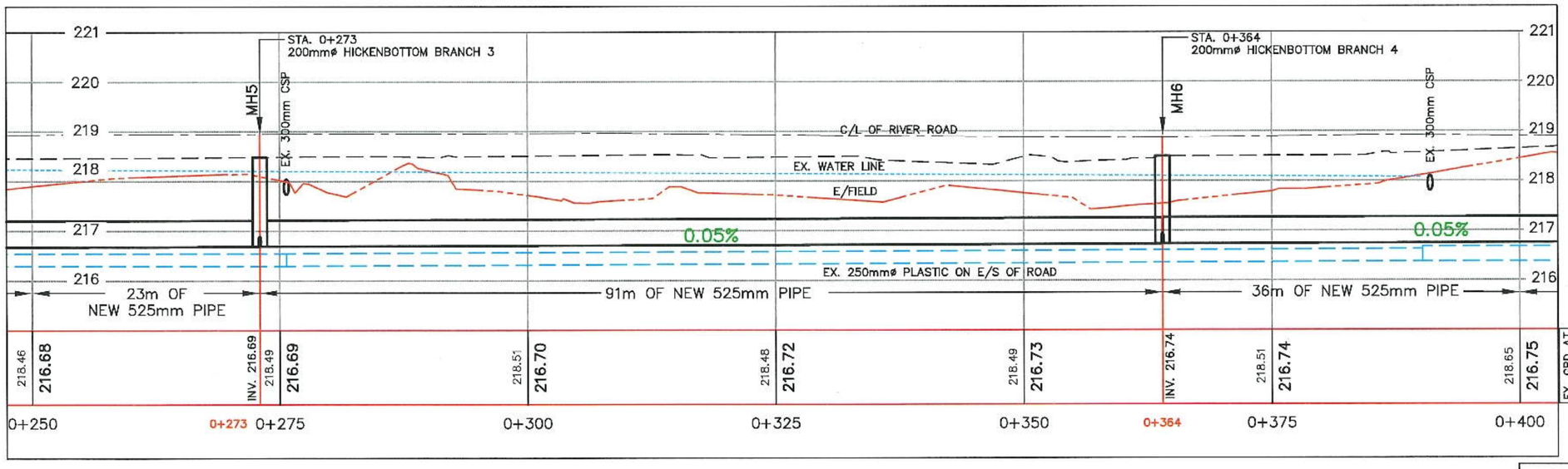


STA. 0+273
PROPOSED MH5
TOP 218.47
S INV. 216.69 IN 525mm
N INV. 216.69 OUT 525mm
W INV. 216.69 OUT 200mm
SUMP 216.39

STA. 0+364
PROPOSED MH6
TOP 218.48
S INV. 216.74 IN 525mm
N INV. 216.74 OUT 525mm
W INV. 216.74 OUT 200mm
SUMP 216.44

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING GROUND ABOVE DRAIN
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN (PLAN)
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED PIPE/CULVERT
- PROPOSED MANHOLE (PLAN)



NOTES:
PIPE CENTRELINE TO BE SET DESIRABLY TO BE 2m EAST OF POLES MINIMUM AND 1.7m WEST MINIMUM FROM EDGE OF ROAD

PEAT BAND IS SHOWN WHERE SURVEYED

SEE DRAWING 10 FOR PROFILES OF HICKENBOTTOM BRANCHES

MH3, MH4, MH5 , MH6 AND MH7 ARE 900x1200mm CB's WITH BIRDCAGE GRATES

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH STA. 0+250 TO 0+400

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42994018
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. 18, 2020
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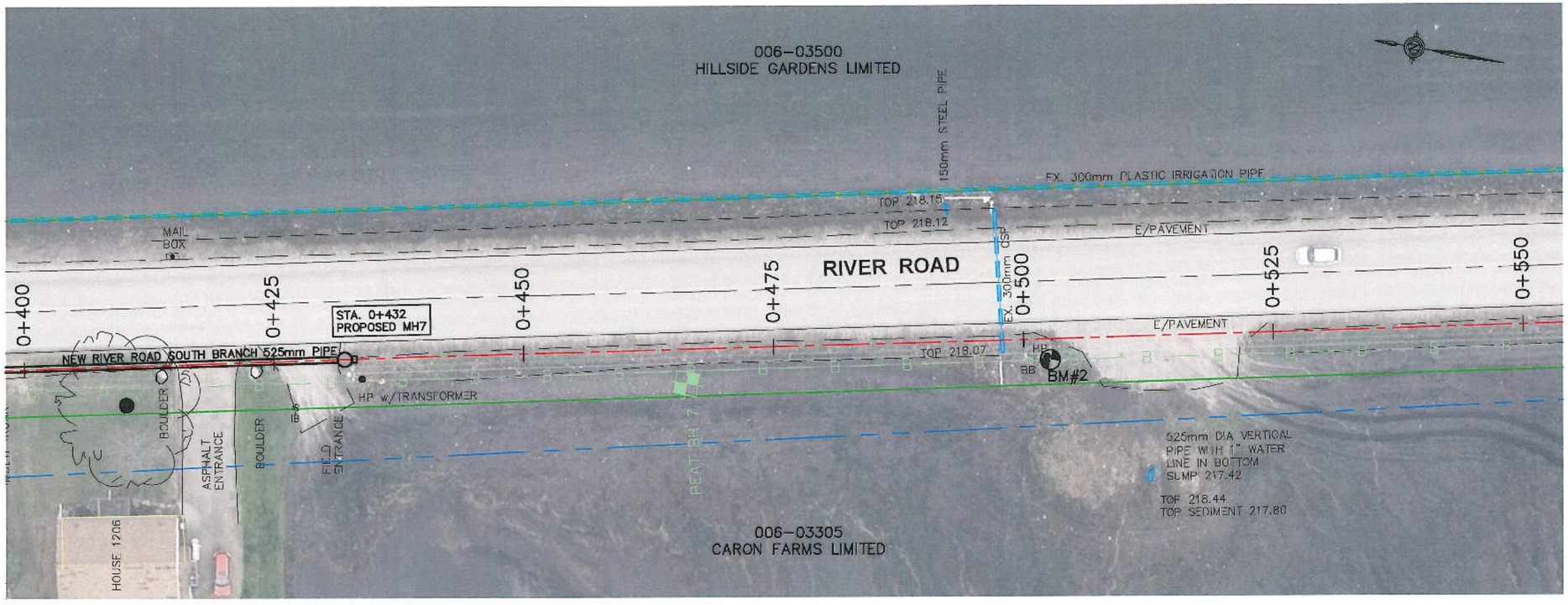
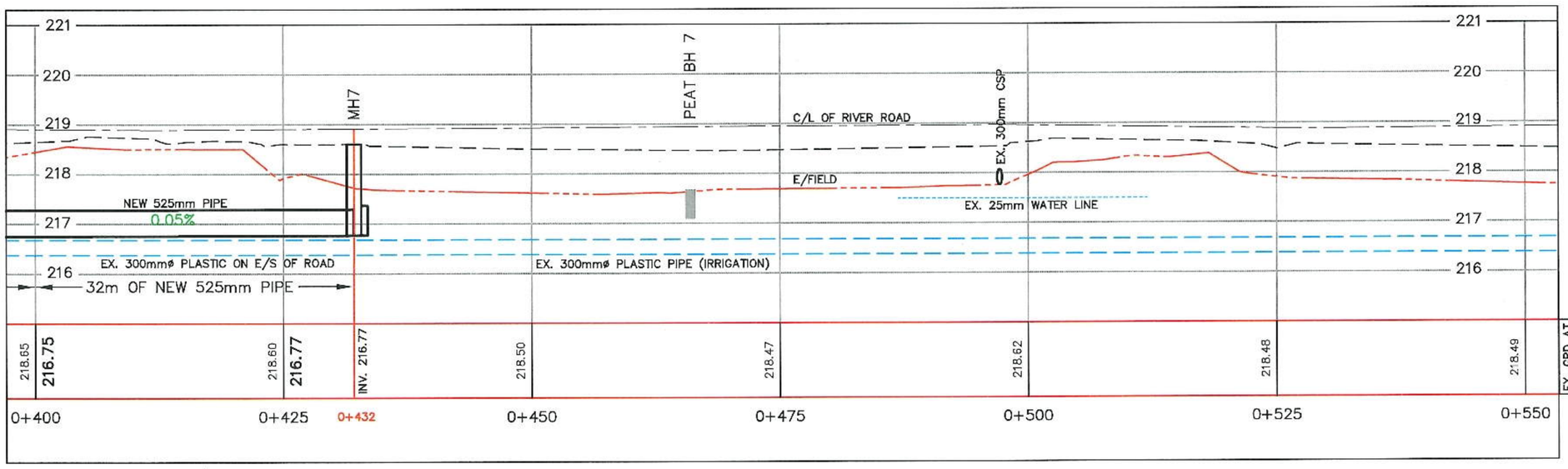


BM#2
SPIKE IN W/SIDE HP #BF72KC W/SIDE RIVER ROAD
ELEV. 218.617

STA. 0+432
PROPOSED MH7
TOP 218.60
S INV. 216.77 IN 525mm STUB
N INV. 216.77 OUT 525mm
SUMP 216.47

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING DITCH (WHERE THERE IS ONE)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED C/L OF DRAIN AND SURVEY LINE (PLAN)
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED PIPE/CULVERT
- PROPOSED MANHOLE (PLAN)



NOTES:
PIPE CENTRELINE TO BE SET DESIRABLY TO BE 2m EAST OF POLES MINIMUM AND 1.7m WEST MINIMUM FROM EDGE OF ROAD

PEAT BAND IS SHOWN WHERE SURVEYED

SEE DRAWING 10 FOR PROFILES OF HICKENBOTTOM BRANCHES

MH3, MH4, MH5 , MH6 AND MH7 ARE 900x1200mm CB's WITH BIRDCAGE GRATES

NOTES:
THIS BRANCH ENDS AT STA 0+432

FROM STA. 0+432 TO 0+700 IS NOT PART OF THIS DRAIN AND IS SHOWN FOR INFORMATION PUPOSES ONLY

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH STA. 0+400 TO 0+432
ALSO RIVER ROAD SOUTH OF STA. 0+432

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER K.A. SMART 42994417 PROVINCE OF ONTARIO

0 5 10m (SCALE 1 : 500) HORZ.
0 1.0 2m (SCALE 1 : 100) VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. 18, 2020
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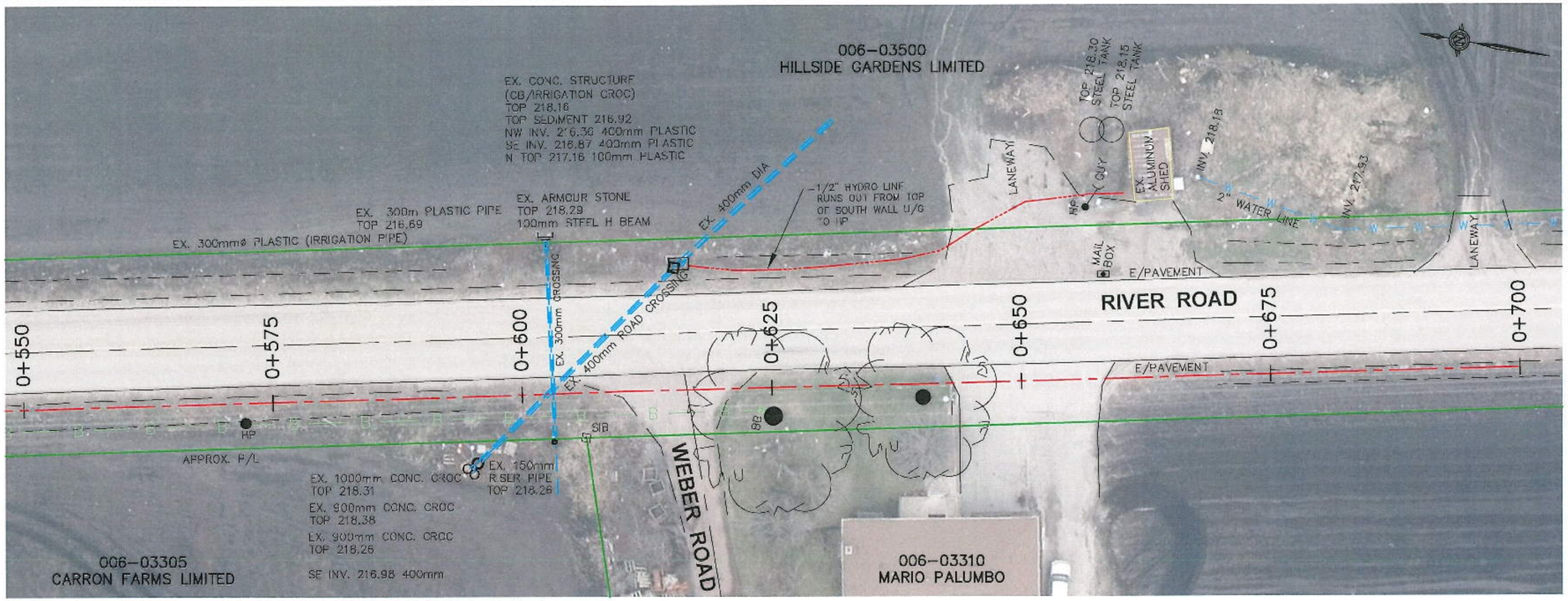

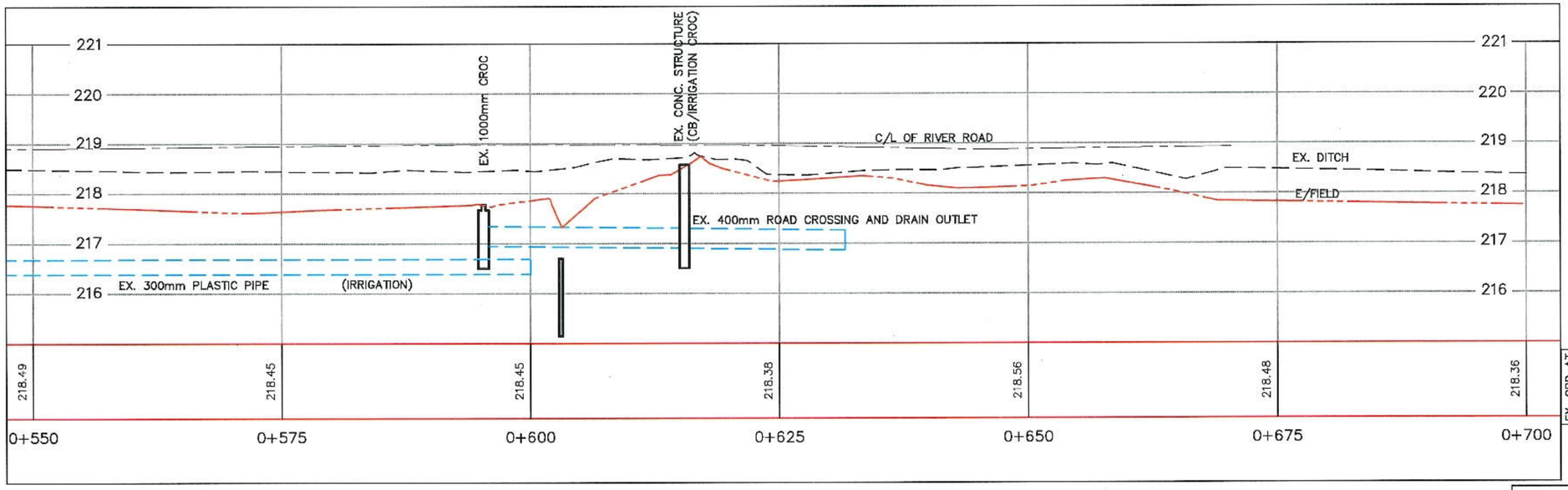

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING GROUND ABOVE DRAIN
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- SURVEY LINE
- EXISTING BELL LINE WITH BOX
- EXISTING IRRIGATION LINE
- PROPOSED PIPE/CULVERT
- PROPOSED MANHOLE (PLAN)

NOTE:
THIS DRAWING IS ENCLOSED TO SHOW THE EXISTING DRAINAGE OUTLETS

FROM STA. 0+432 TO 0+700 IS NOT PART OF THIS DRAIN AND IS SHOWN FOR INFORMATION PUPOSES ONLY

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH 0+550
ALSO RIVER ROAD SOUTH OF STA. 0+550

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42954012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
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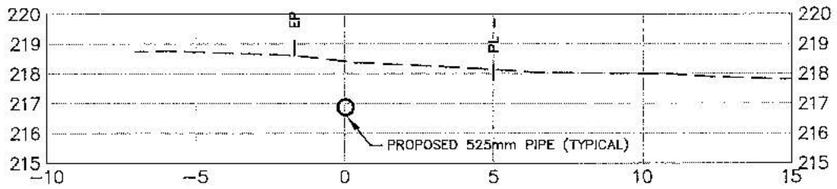

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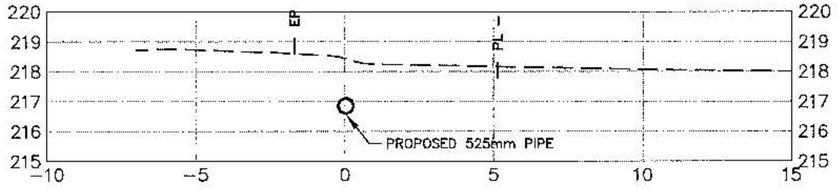

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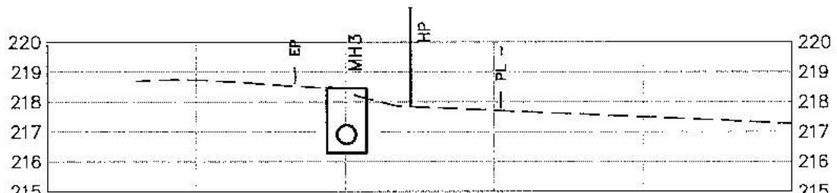

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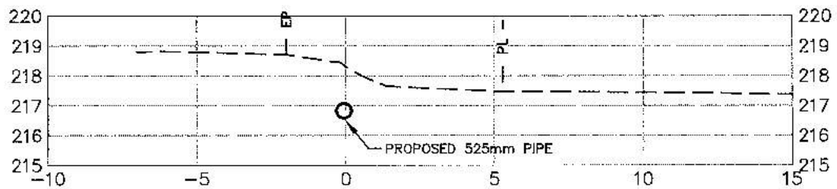

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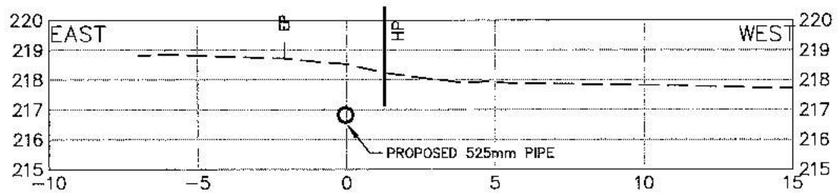

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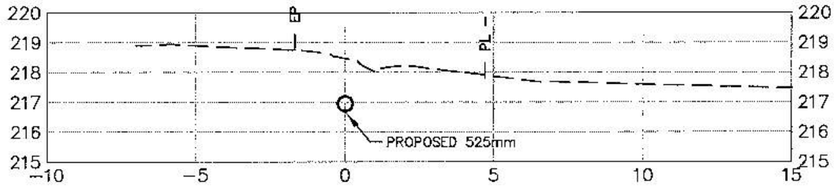

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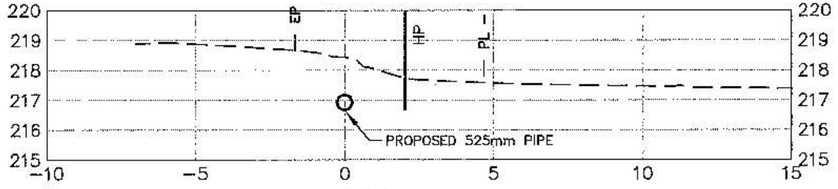

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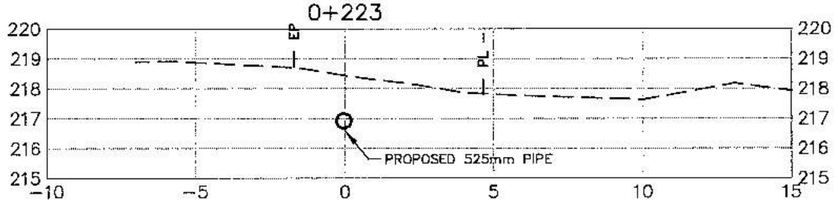

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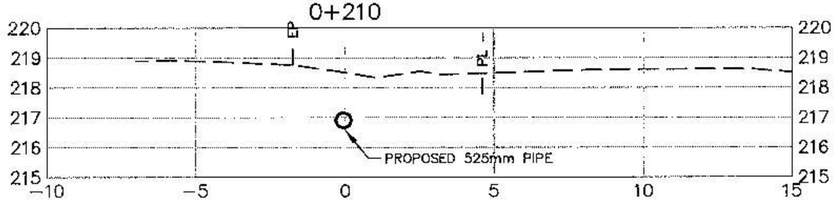

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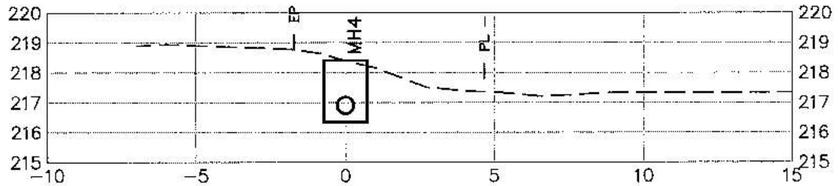

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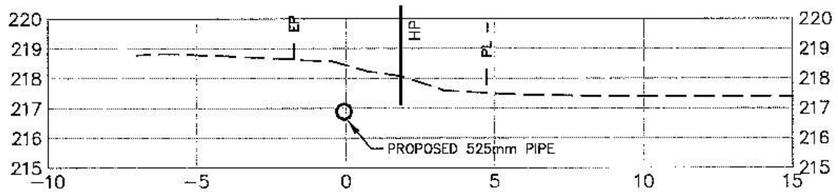

0+151

DESIGNED BY: K.A.S.

DRAWN BY: N.M.B.

CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42994422
PROVINCE OF ONTARIO

(SCALE 1 : 200)
HORZ.

(SCALE 1 : 200)
VERT.

SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH CROSS SECTIONS

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — BARRIE

SEPT. 18, 2020

JOB NUMBER 19-034

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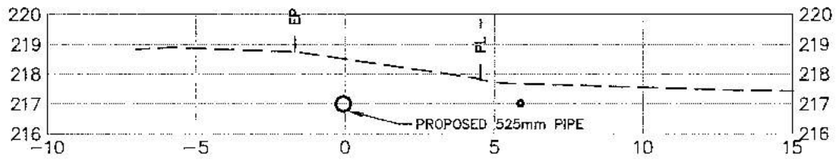

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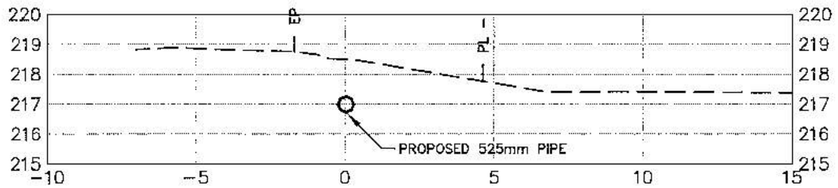

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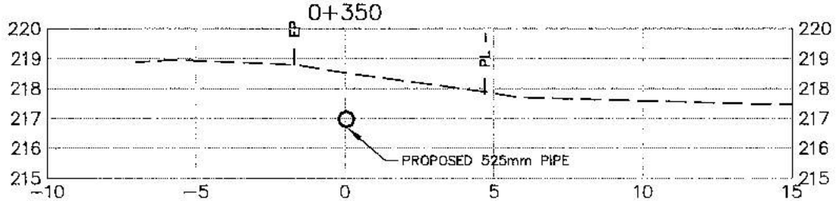

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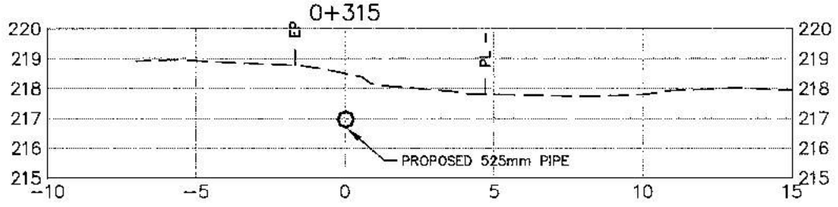

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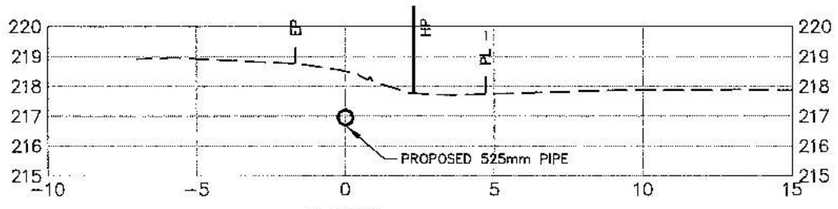

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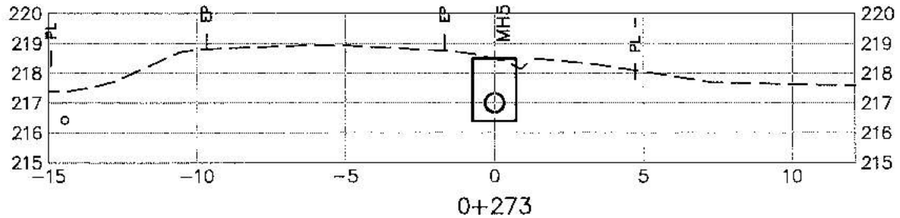

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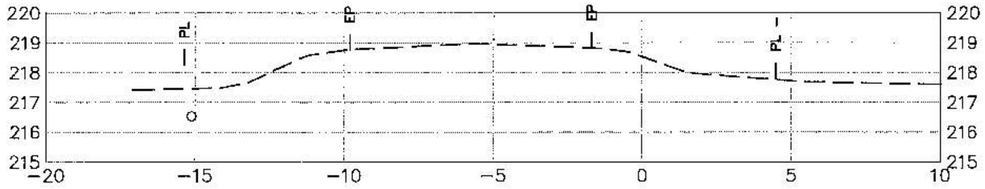

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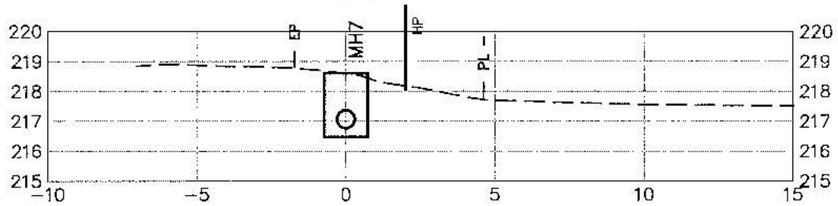

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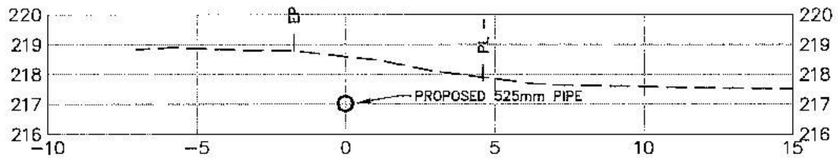

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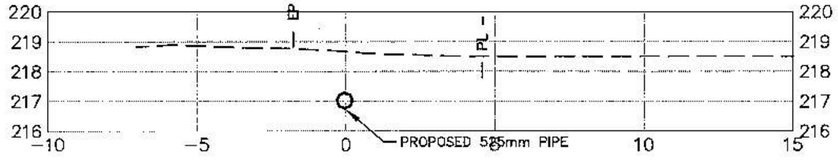

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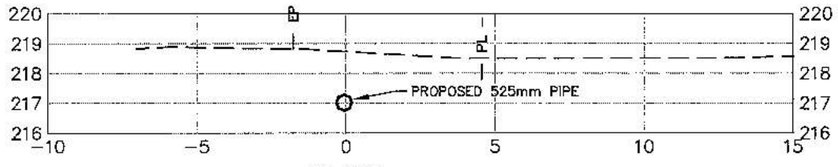

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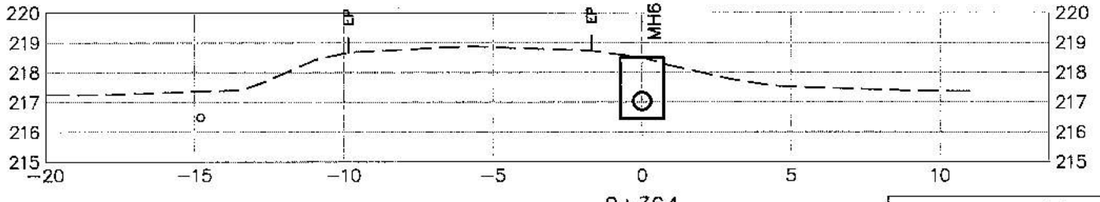

0+364

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH CROSS SECTIONS

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER — K. SMART — 90994312 — PROVINCE OF ONTARIO

0 2 4m (SCALE 1 : 200) HORZ.
0 2 4m (SCALE 1 : 200) VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. , 2020
JOB NUMBER: 19-034
17 OF 34

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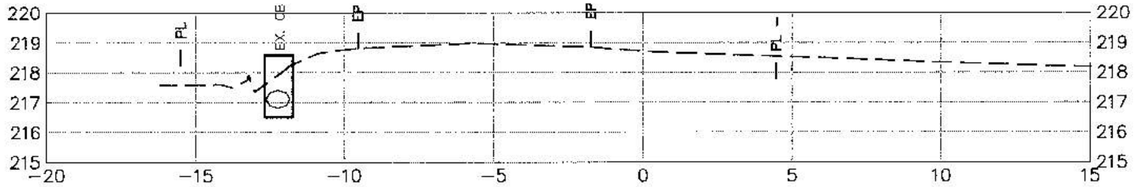

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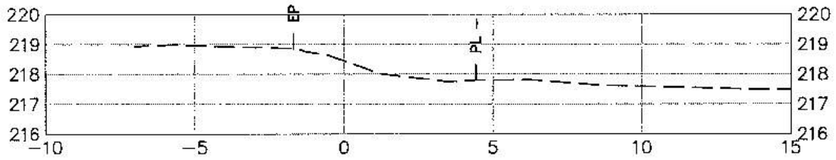

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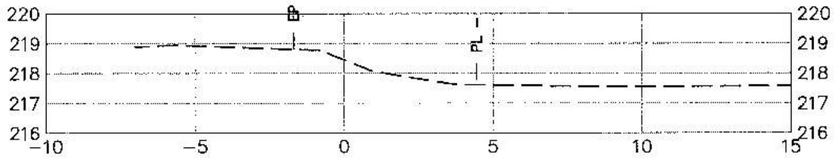

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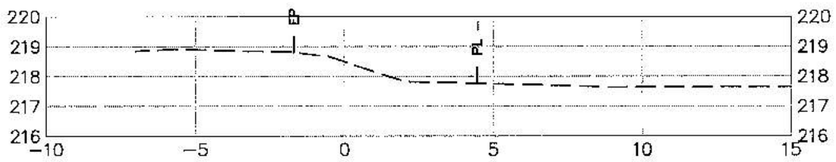

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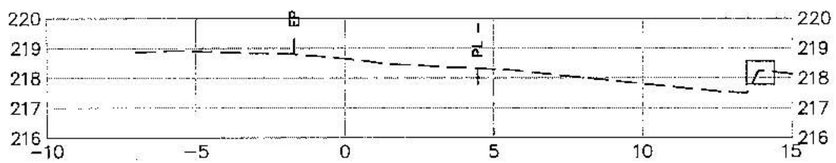

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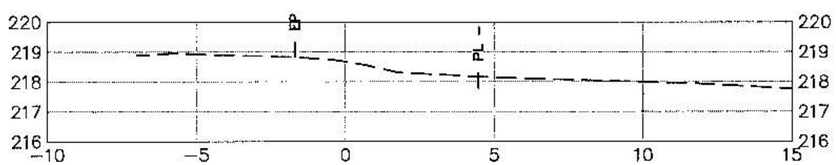

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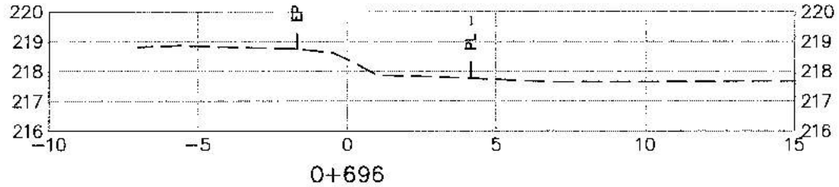

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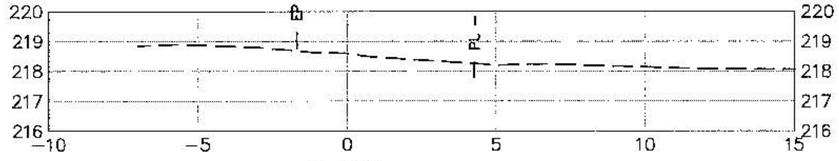

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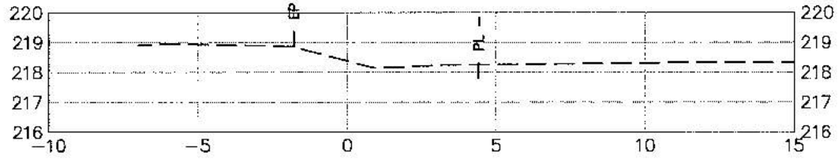


0+625

NOTE:
THE CROSS-SECTIONS SHOWN ON THIS DRAWING ARE FOR INFORMATION PURPOSES ONLY. THEY ARE NOT PART OF DRAIN

DESIGNED BY: K.A.S.
DRAWN BY: N.M.D.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
PROVINCE OF ONTARIO

0 2 4m
(SCALE 1 : 200)
HORZ.
0 2 4m
(SCALE 1 : 200)
VERT.
SCALE (ON 11x17)

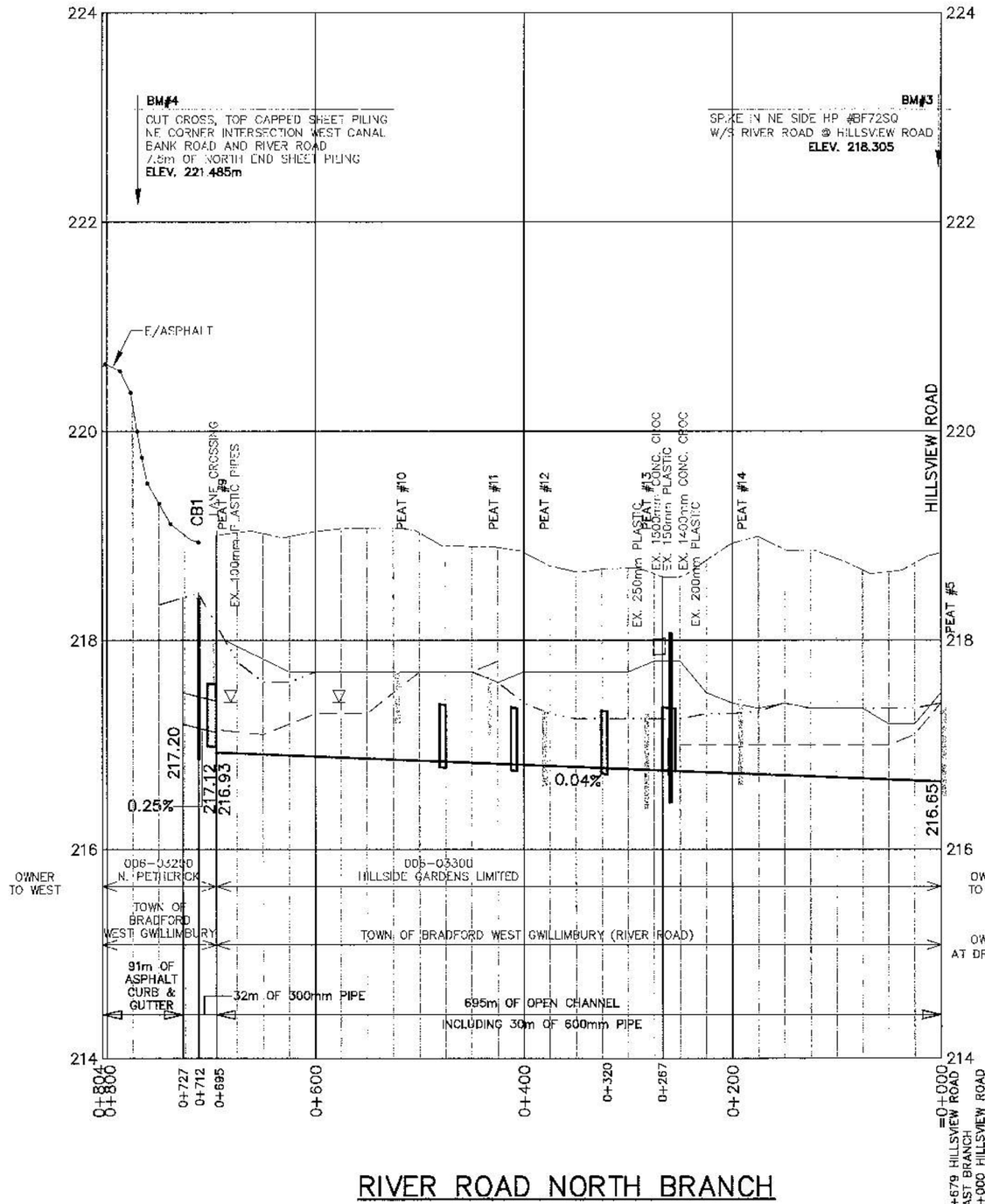
RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD SOUTH BRANCH CROSS SECTIONS

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — BARRIE

SEPT. 18, 2020
JOB NUMBER: 19-034



RIVER ROAD NORTH BRANCH

LEGEND

- EXISTING DITCH (WHERE THERE IS ONE)
- EXISTING GROUND ABOVE NEW DITCH
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL
- PROPOSED CHANNEL BOTTOM
- PROPOISED CULVERT/PIPE
- PROPOSED CATCHBASIN
- PROPOSED CURB AND GUTTER
- PEAT #12 — PEAT TEST HOLE NUMBER AND LOCATION

NOTES:
ELEVATIONS ARE FOR GRADE LINE (DITCH WHERE IT IS TO BE DONE)

CULVERTS/PIPES ARE TO BE RECESSED BY 50 TO 100MM BELOW GRADE LINE AS NOTED

ALL PIPE ON THIS PROJECT IS TO BE SMOOTH WALL HDPE PIPE

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENCED PROFESSIONAL ENGINEER K. A. SMART 2594012 PROVINCE OF ONTARIO

0 50 100m (SCALE 1 : 5000) HORZ.
0 0.5 1m (SCALE 1 : 50) VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH PROFILE

SEPT. 18, 2020

REVISED:

JOB NUMBER: 19-034

DRAWING 19 OF 34

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

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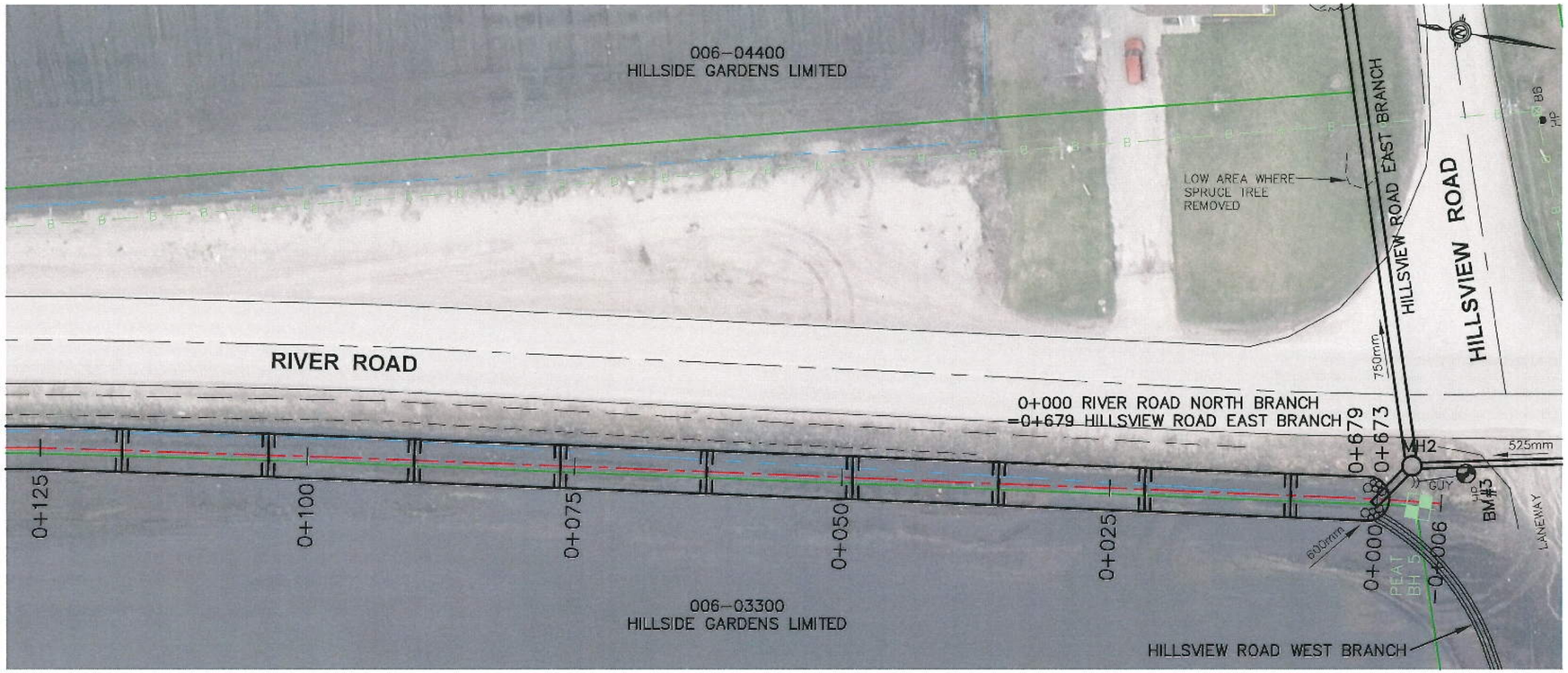

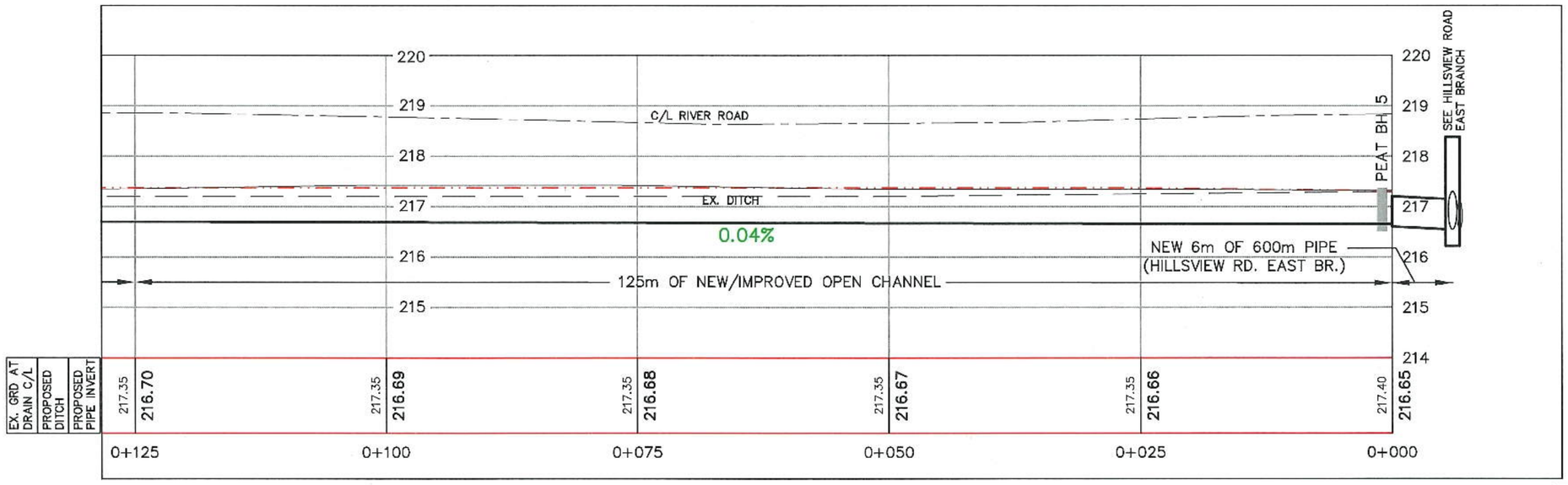

BM#3
SPIKE IN NE SIDE H.P. #BF42SQ
WEST SIDE RIVER ROAD AT HILLSVIEW ROAD
ELEV. 218.305

NOTES:
SEE CROSS SECTIONS FOR NOTES REGARDING DRAIN CENTRELINE LOCATION

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING DITCH (WHERE THERE IS ONE) (PROFILE)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL (PROFILE)
- EXISTING GROUND AT DITCH
- PROPOSED C/L OF DRAIN (PLAN)
- BOTTOM OF PROPOSED DITCH
- EXISTING BELL LINE WITH BOX (PLAN)
- PROPOSED MANHOLE
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH (PLAN)
- RIPRAP

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH STA. 0+000 TO 0+125

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER — K.A. SMART — 42994012 — PROVINCE OF ONTARIO

0 5 10m (SCALE 1 : 500) HORZ.
0 1.0 2m (SCALE 1 : 100) VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034

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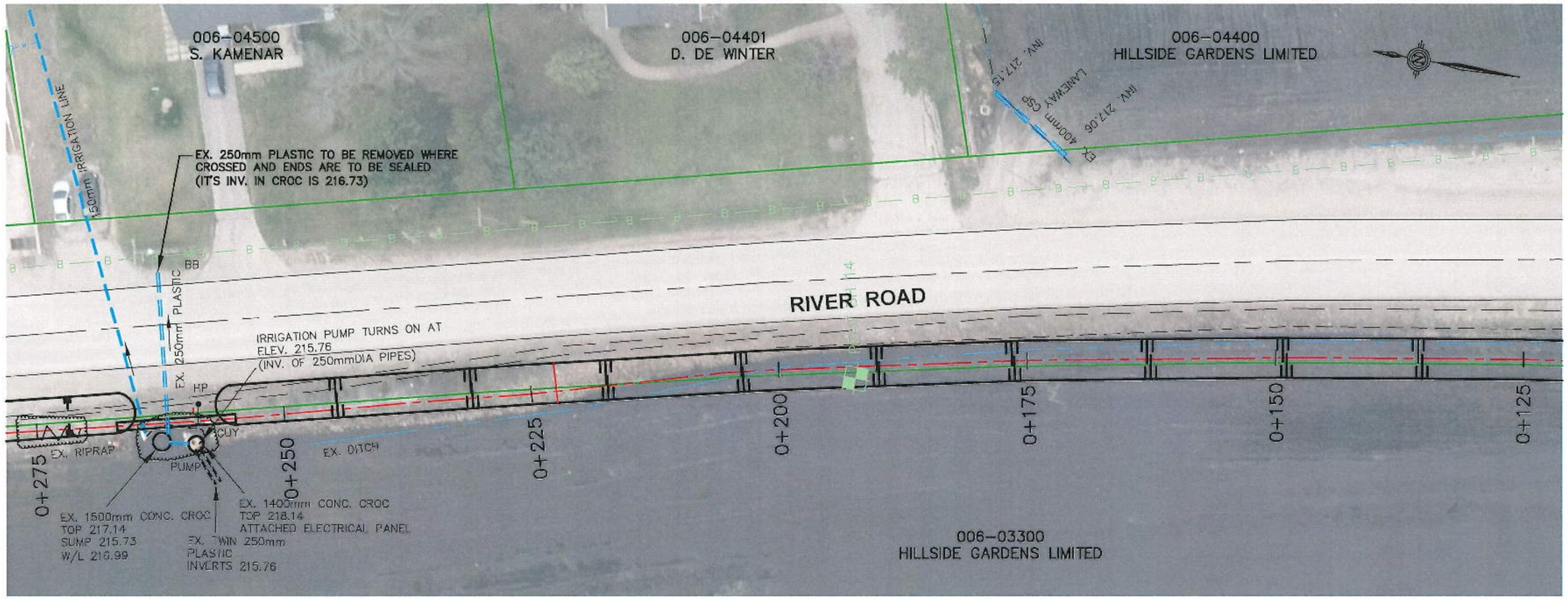


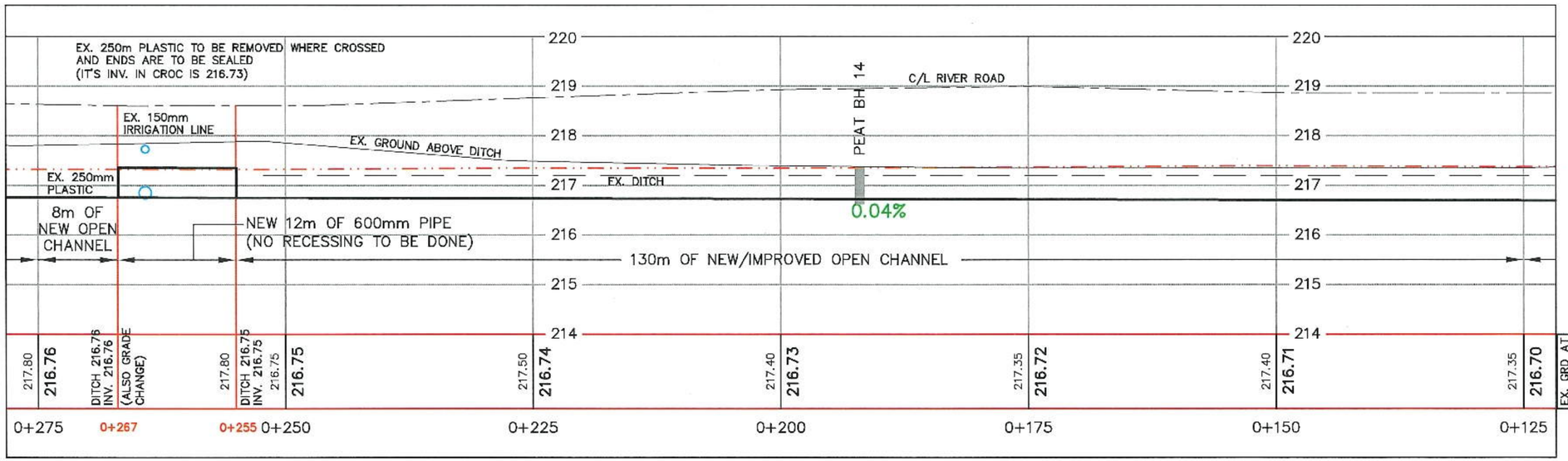
CONSTRUCTION NOTES:
FROM STA. 0+150± TO 0+400± PARKING LANE ON ROAD TO BE REMOVED AND ROAD CROSS-SECTION CREATED TO BE SIMILAR TO UPSTREAM AND DOWNSTREAM PORTIONS.

AT HYDRO BRACE POLES, CULVERTS TO BE PLACED TO MAINTAIN BRACE POLES. REMOVE AND RESET GUY WIRES AS NECESSARY, BRACE/SUPPORT POLE AS NECESSARY. LONGER CULVERT REQUIRED AT 0+260± DUE TO EXISTENCE OF CONCRETE CROCS

REMOVE AND DISPOSE OF OLD CONCRETE LAMP POLES WHERE EXISTING IN ROAD EMBANKMENT (FROM STA. 0+270 TO 0+330±)

WHERE AREAS OF RIPRAP EXISTS, SALVAGE AND REPLACE SUCH IN NEW CHANNEL BANK. (RECESS INTO THE BANK.)

SEE CROSS SECTIONS FOR NOTES REGARDING DRAIN CENTRELINE LOCATION



LEGEND

- PROPERTY LINE (PLAN)
- EXISTING DITCH (PROFILE) (WHERE THERE IS ONE)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL (PROFILE)
- EXISTING GROUND AT DITCH
- PROPOSED C/L OF DRAIN (PLAN)
- BOTTOM OF PROPOSED DITCH
- EXISTING BELL LINE WITH BOX (PLAN)
- PROPOSED MANHOLE
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH (PLAN)

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER K.A. SMART 42994012 PROVINCE OF ONTARIO

0 5 10m (SCALE 1 : 500) HORZ.
0 1.0 2m (SCALE 1 : 100) VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH STA. 0+125 TO 0+275

SEPT. 18, 2020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

JOB NUMBER: 19-034

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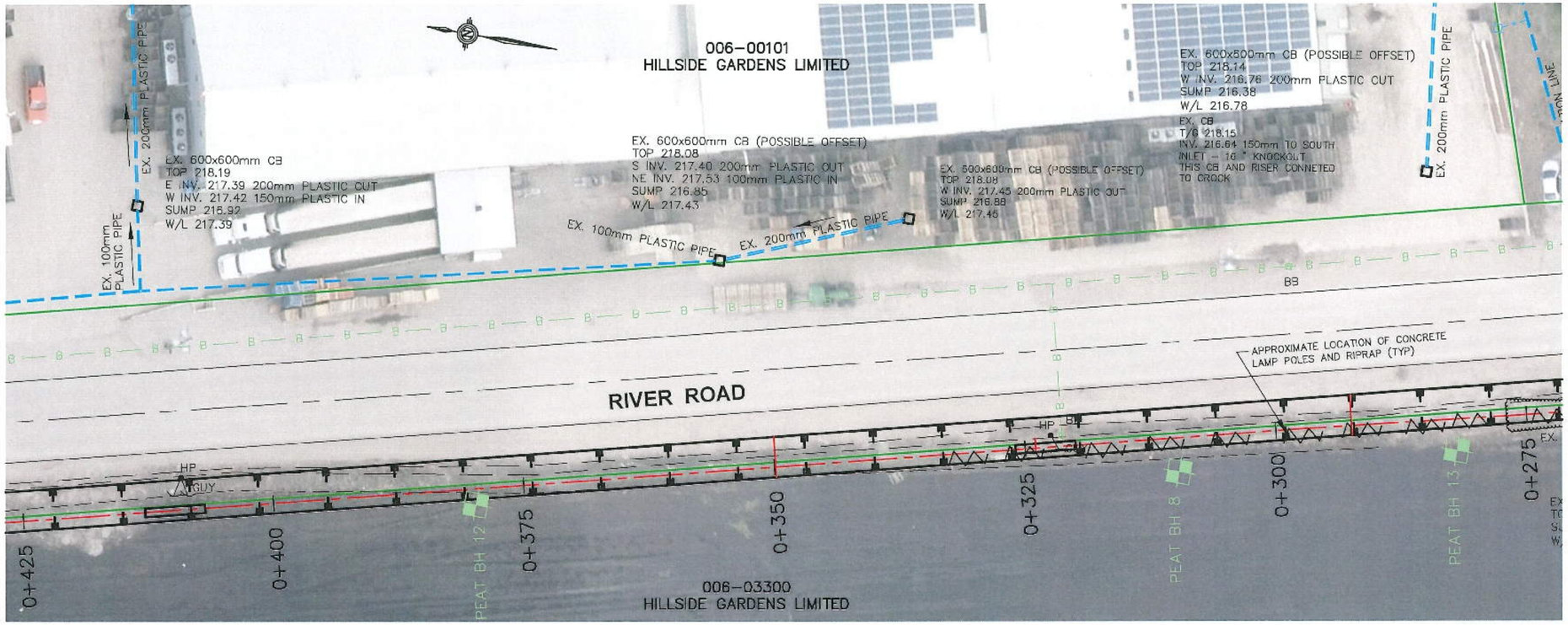


CONSTRUCTION NOTES:
FROM STA. 0+150± TO 0+400± PARKING LANE ON ROAD TO BE REMOVED AND ROAD CROSS-SECTION CREATED TO BE SIMILAR TO UPSTREAM AND DOWNSTREAM PORTIONS.

AT HYDRO BRACE POLES, CULVERTS TO BE PLACED TO MAINTAIN BRACE POLES. REMOVE AND RESET GUY WIRES AS NECESSARY, BRACE/SUPPORT POLE AS NECESSARY. LONGER CULVERT REQUIRED AT 0+260± DUE TO EXISTENCE OF CONCRETE CROCS

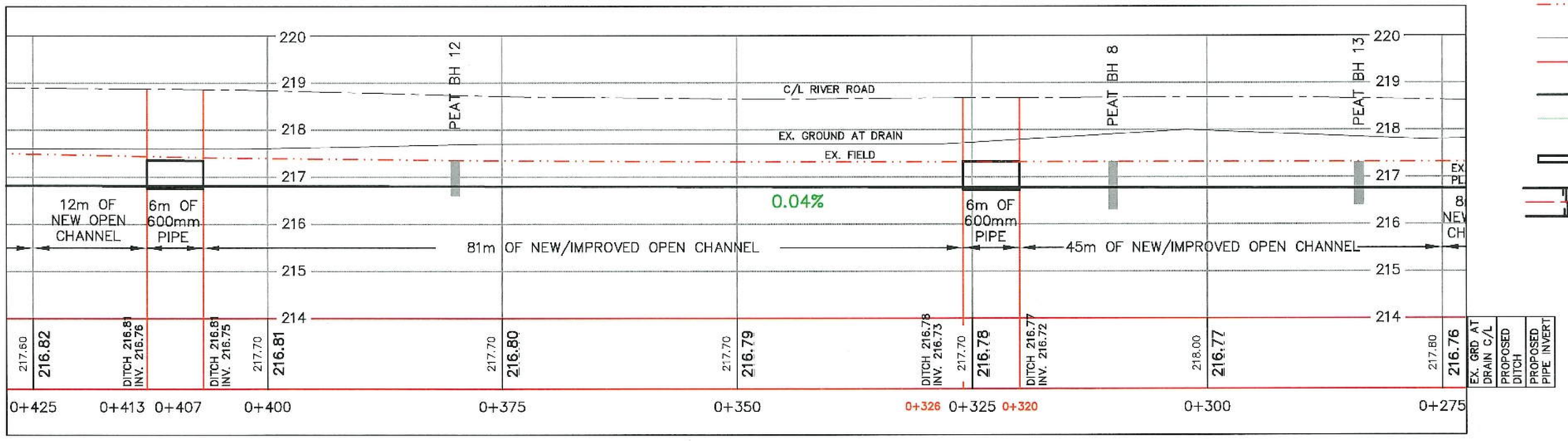
REMOVE AND DISPOSE OF OLD CONCRETE LAMP POLES WHERE EXISTING IN ROAD EMBANKMENT (FROM STA. 0+270 TO 0+330±)

WHERE AREAS OF RIPRAP EXISTS, SALVAGE AND REPLACE SUCH IN NEW CHANNEL BANK. (RECESS INTO THE BANK.)

SEE CROSS SECTIONS FOR NOTES REGARDING DRAIN CENTRELINE LOCATION

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING DITCH (PROFILE) (WHERE THERE IS ONE)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL (PROFILE)
- EXISTING GROUND AT DITCH
- PROPOSED C/L OF DRAIN (PLAN)
- BOTTOM OF PROPOSED DITCH
- EXISTING BELL LINE WITH BOX (PLAN)
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH (PLAN)



RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH STA. 0+275 TO 0+425

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER — K.A. SMART — 42994012 — PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500) HORZ.
0 1.0 2m
(SCALE 1 : 100) VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034
22 OF 34

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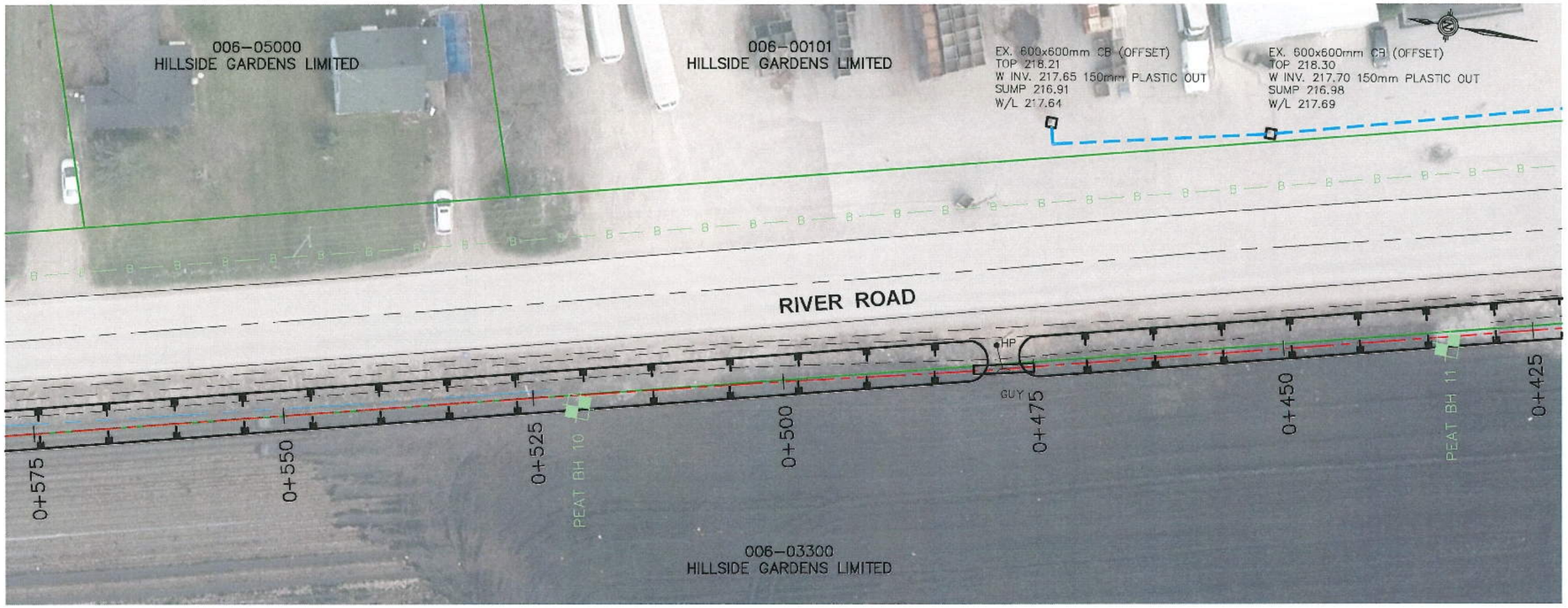


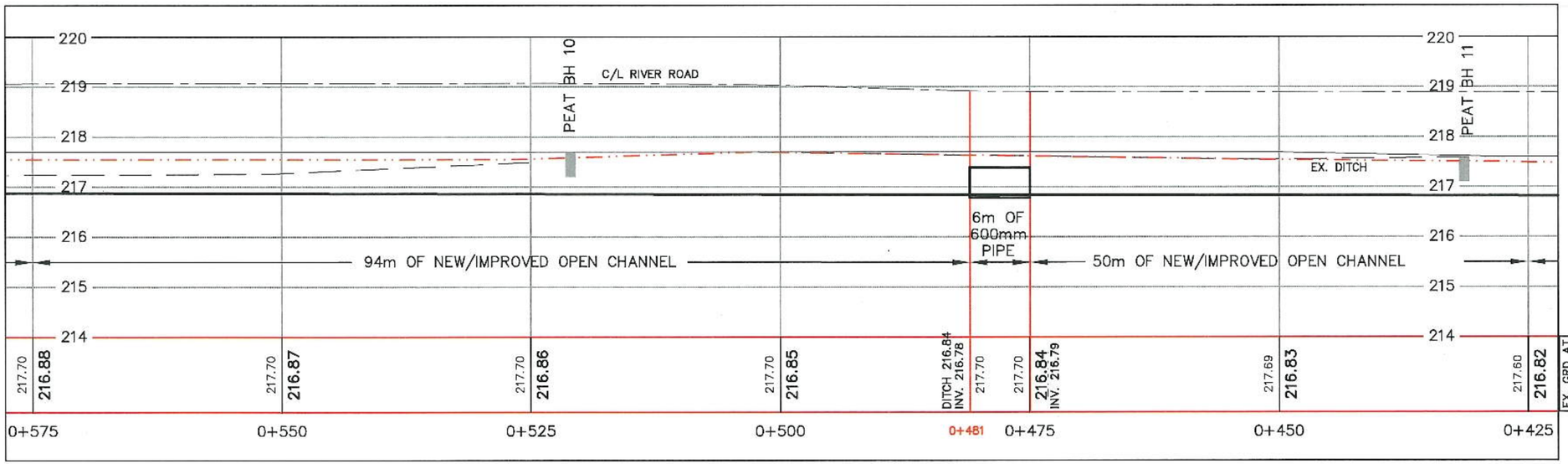
CONSTRUCTION NOTES:
FROM STA. 0+150± TO 0+400± PARKING LANE ON ROAD TO BE REMOVED AND ROAD CROSS-SECTION CREATED TO BE SIMILAR TO UPSTREAM AND DOWNSTREAM PORTIONS.

AT HYDRO BRACE POLES, CULVERTS TO BE PLACED TO MAINTAIN BRACE POLES. REMOVE AND RESET GUY WIRES AS NECESSARY. BRACE/SUPPORT POLE AS NECESSARY. LONGER CULVERT REQUIRED AT 0+260± DUE TO EXISTENCE OF CONCRETE CROCS

REMOVE AND DISPOSE OF OLD CONCRETE LAMP POLES WHERE EXISTING IN ROAD EMBANKMENT (FROM STA. 0+270 TO 0+330±)

WHERE AREAS OF RIPRAP EXISTS, SALVAGE AND REPLACE SUCH IN NEW CHANNEL BANK. (RECESS INTO THE BANK.)

SEE CROSS SECTIONS FOR NOTES REGARDING DRAIN CENTRELINE LOCATION



LEGEND

- PROPERTY LINE (PLAN)
- EXISTING DITCH (PROFILE) (WHERE THERE IS ONE)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL (PROFILE)
- EXISTING GROUND AT DITCH
- PROPOSED C/L OF DRAIN (PLAN)
- BOTTOM OF PROPOSED DITCH
- EXISTING BELL LINE WITH BOX (PLAN)
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH (PLAN)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH STA. 0+425 TO 0+575

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER K.A. SMART R2994018 PROVINCE OF ONTARIO

0 5 10m (SCALE 1 : 500) HORZ.
0 1.0 2m (SCALE 1 : 100) VERT.
SCALE (ON 11x17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034

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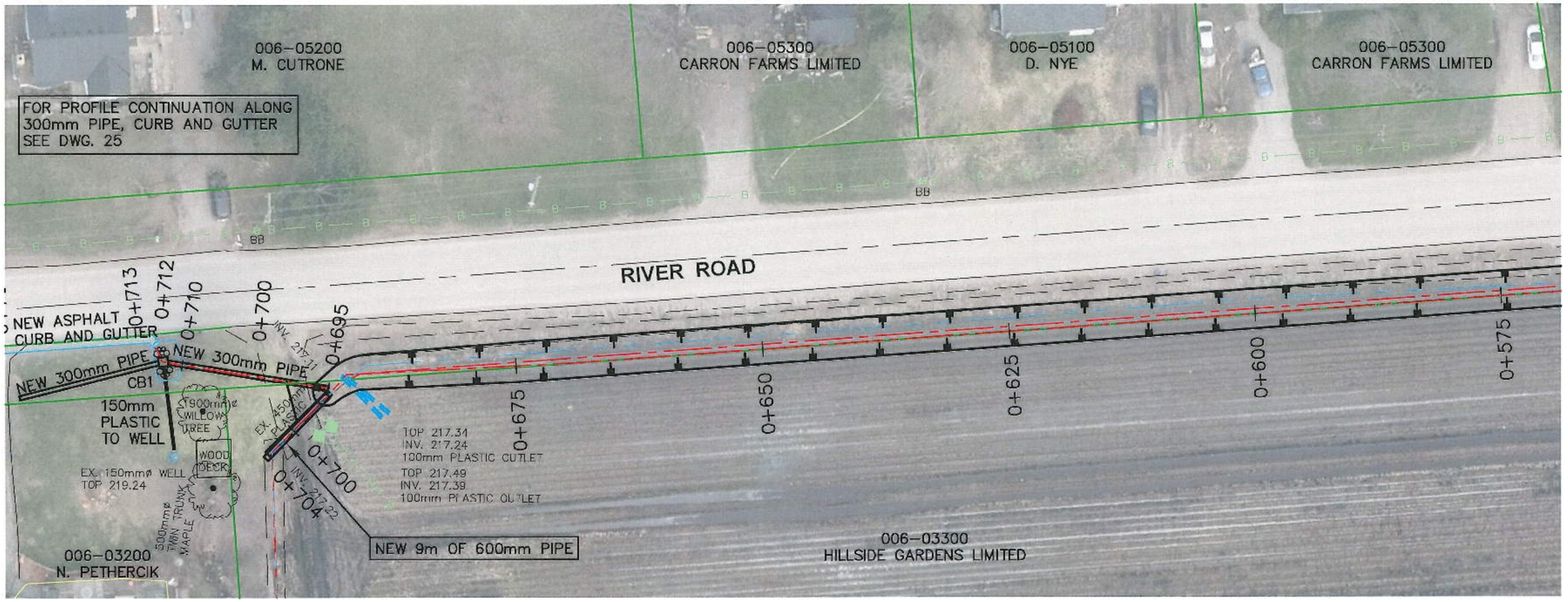
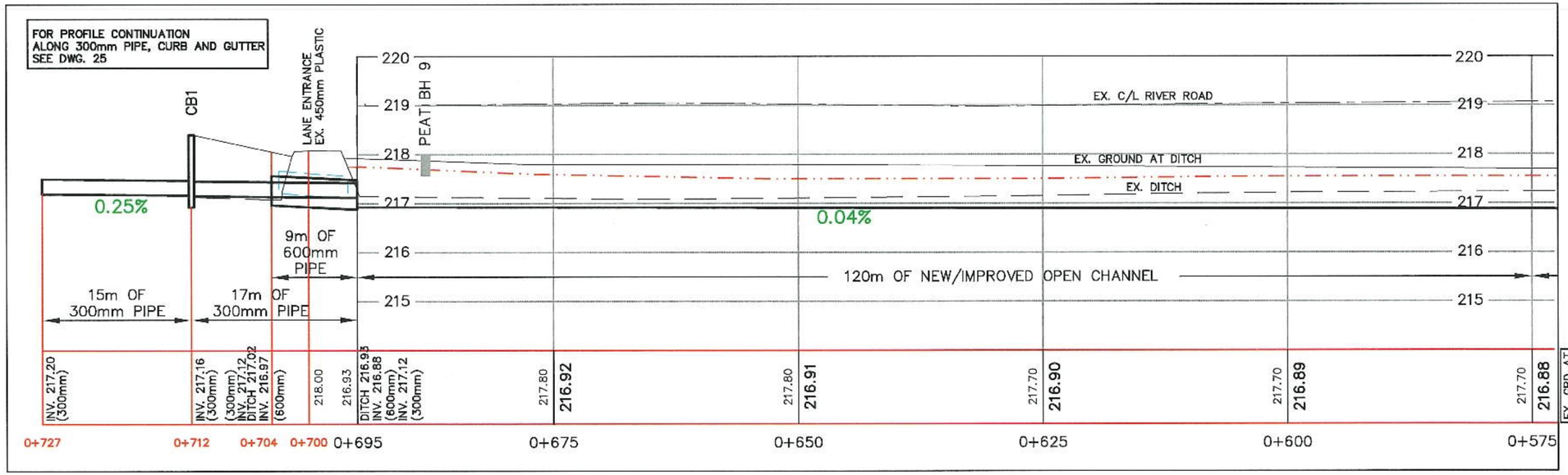


NOTE:
SEE CROSS SECTIONS FOR NOTES REGARDING DRAIN CENTRELINE LOCATION

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING DITCH (PROFILE) (WHERE THERE IS ONE)
- CENTRE LINE OF ROAD
- EXISTING FIELD/LOT LEVEL (PROFILE)
- EXISTING GROUND AT DITCH
- PROPOSED C/L OF DRAIN (PLAN)
- BOTTOM OF PROPOSED DITCH
- EXISTING BELL LINE WITH BOX (PLAN)
- PROPOSED CATCHBASIN
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH (PLAN)



DESIGNED BY:	K.A.S.
DRAWN BY:	N.M.B.
CHECKED BY:	K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42994012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH STA. 0+575 TO 0+695

SEPT. 18, 2020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

JOB NUMBER: 19-034

24 OF 34

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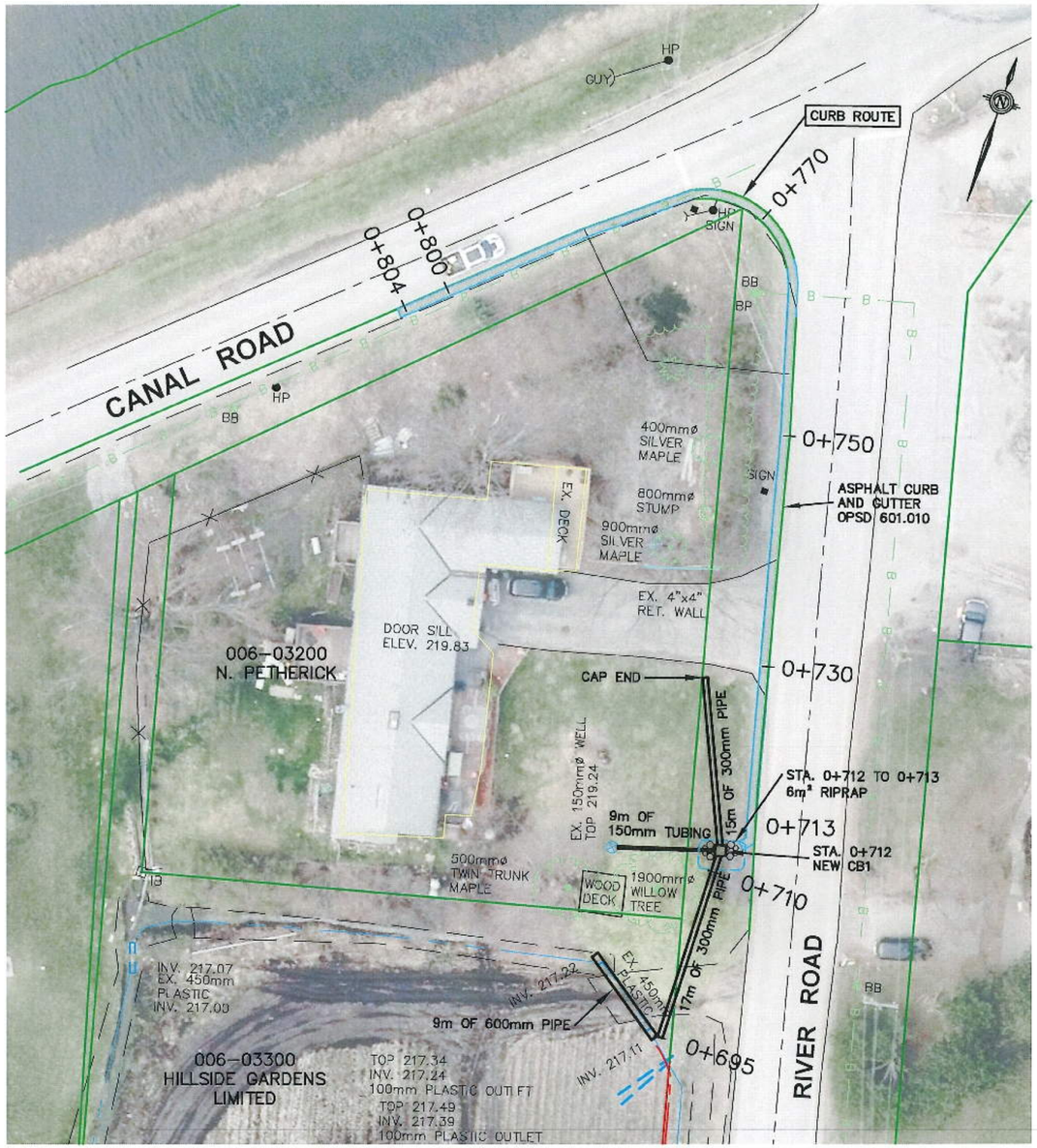
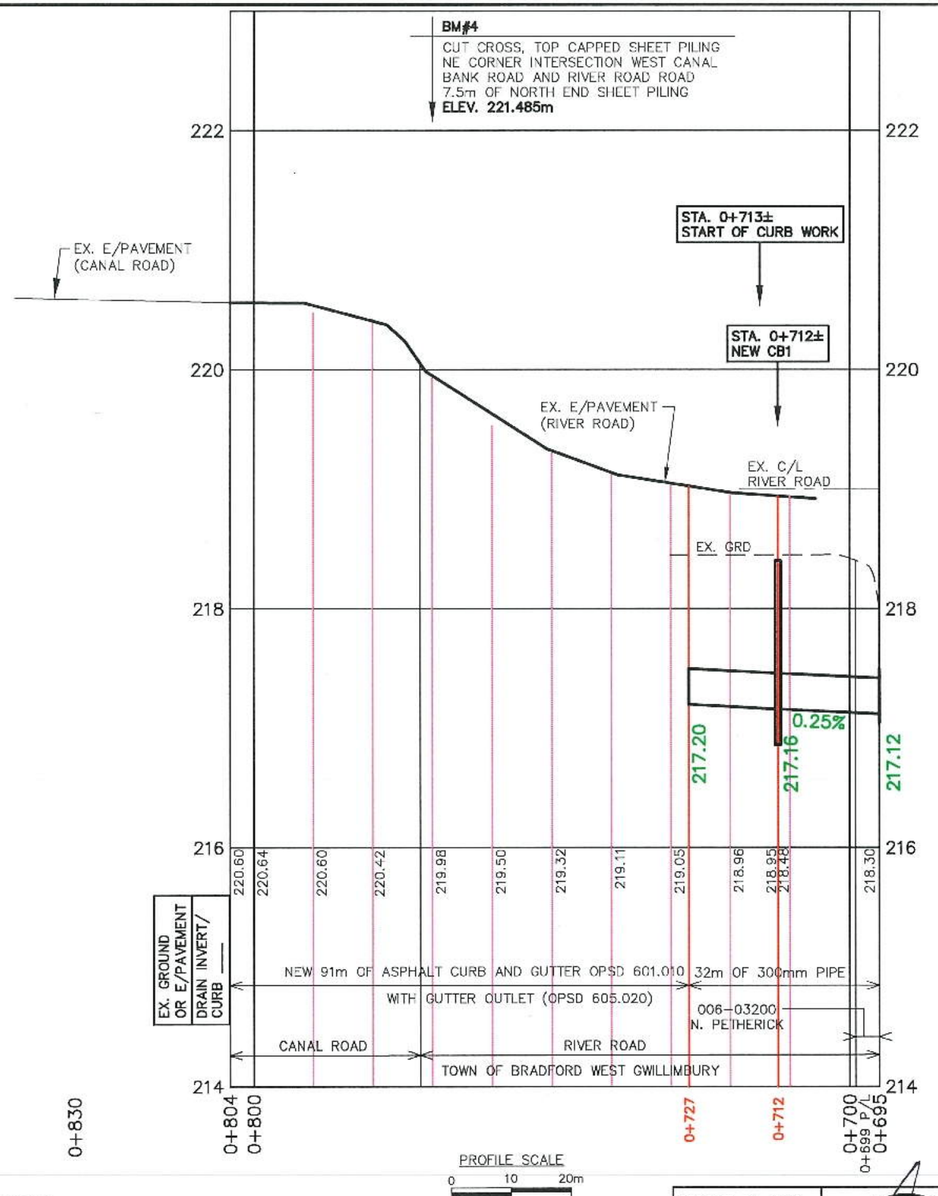


PLAN

0 5 10m

1:500

SCALE (ON 11x17)



PROFILE SCALE

0 10 20m

(SCALE 1 : 1000) HORZ.

0 0.5 1m

(SCALE 1 : 50) VERT.

SCALE (ON 11x17)

LEGEND

- PROPERTY LINE
- CENTRE LINE OF ROAD
- PROPOSED C/L OF OPEN DRAIN
- EDGE OF PAVEMENT
- EXISTING BELL LINE WITH BOX
- PROPOSED CURB AND GUTTER (PLAN)
- PROPOSED CATCHBASIN
- PROPOSED PIPE/CULVERT
- PROPOSED DITCH

STA. 0+712
PROPOSED CB1 600x600mm
TOP 218.40
S INV. 217.16 (300mm PIPE)
N INV. 217.16 (300mm PIPE)
W INV. 217.23 (150mm) TUBING LEAD TO WELL
SUMP 216.86

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER K.A. SMART 42984012 PROVINCE OF ONTARIO

SCALE AS SHOWN (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH
PETHERICK PROPERTY PLAN AND PROFILE
STA. 0+695 TO 0+804

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020

JOB NUMBER: 19-034

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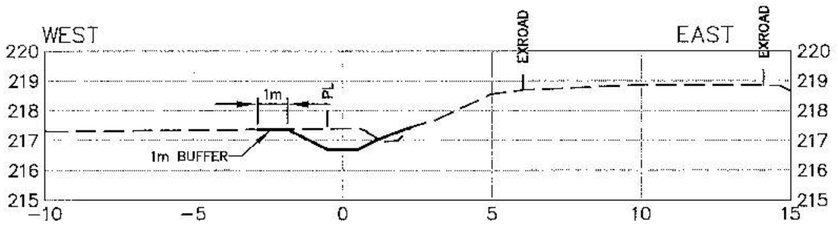

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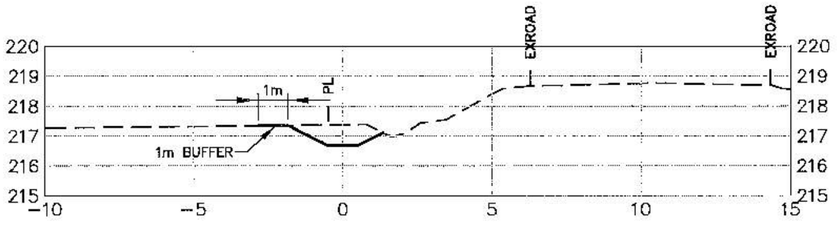

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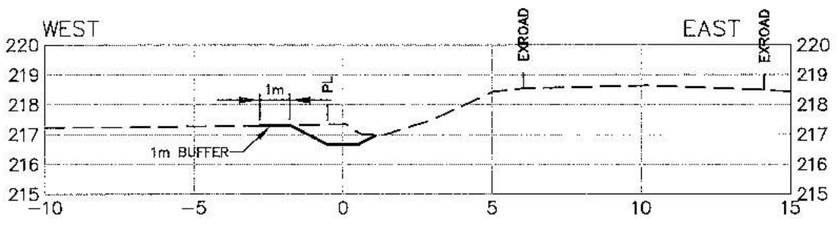

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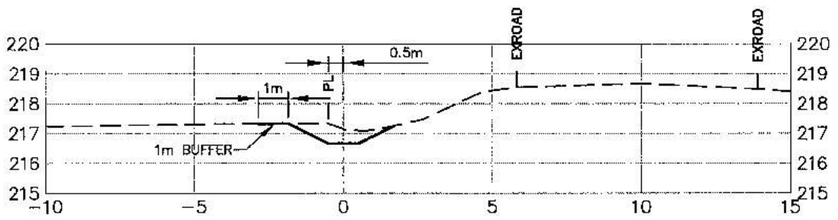

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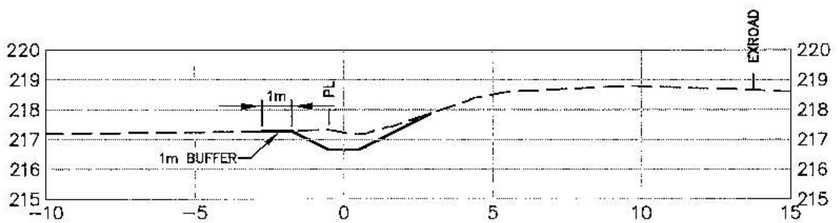

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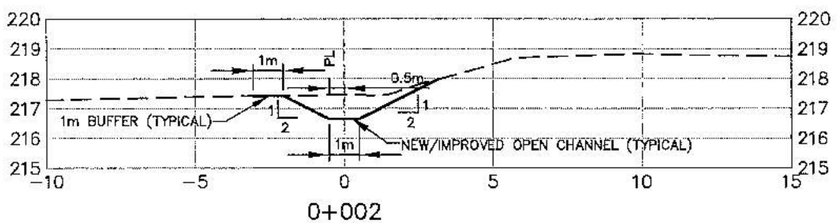

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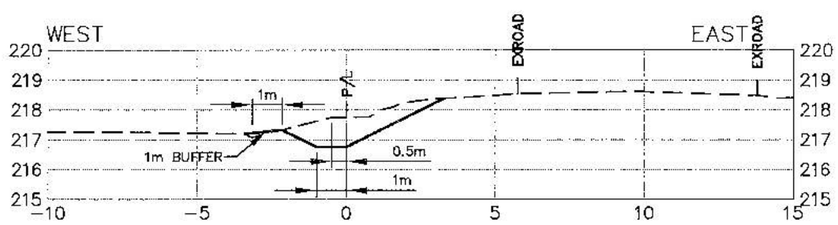

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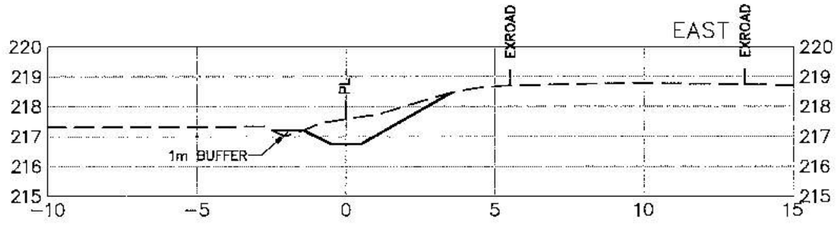

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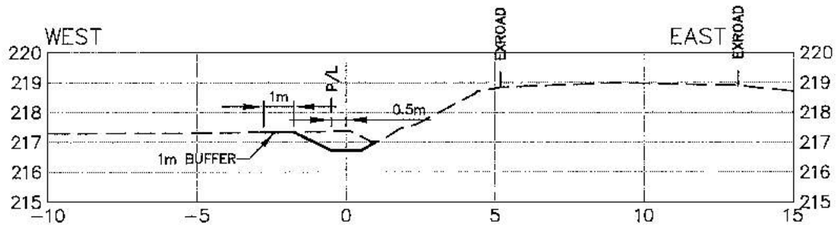

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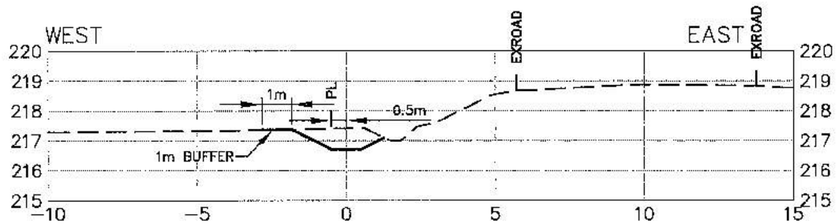

0+151

NOTES:
DITCH/DRAIN CENTRELINE IS 0.5m INSIDE PROPERTY LINE STA. 0+000 TO 0+200

TRANSITION FROM STA. 0+200 TO 0+250

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH CROSS SECTIONS

DESIGNED BY: K.A.S.	
DRAWN BY: N.M.B.	
CHECKED BY: K.A.S.	

LICENSED PROFESSIONAL ENGINEER — K.A. SMART — 42394012 — PROVINCE OF ONTARIO

0 2 4m
(SCALE 1 : 200)
HORZ.
0 2 4m
(SCALE 1 : 200)
VERT.
SCALE (ON 11 x 17)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034
26 OF 34

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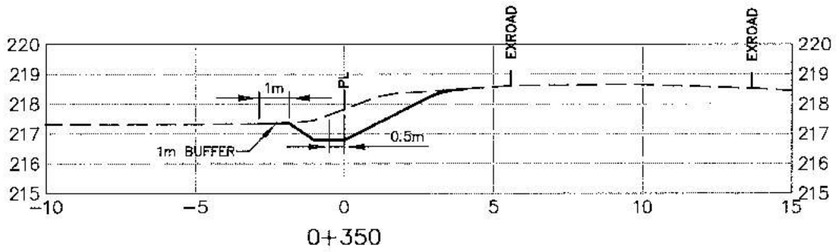

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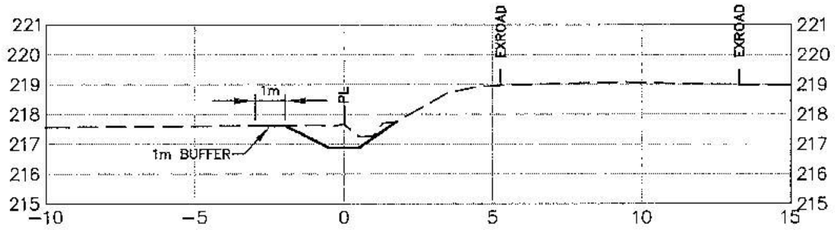

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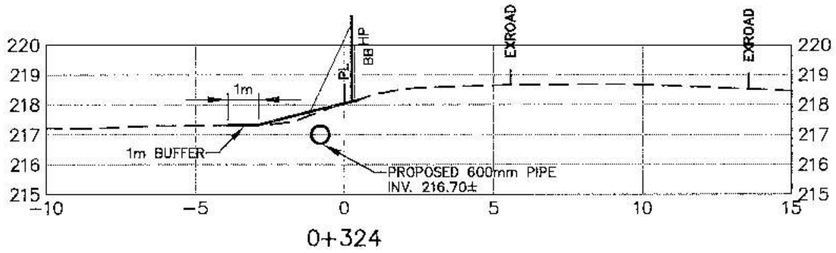

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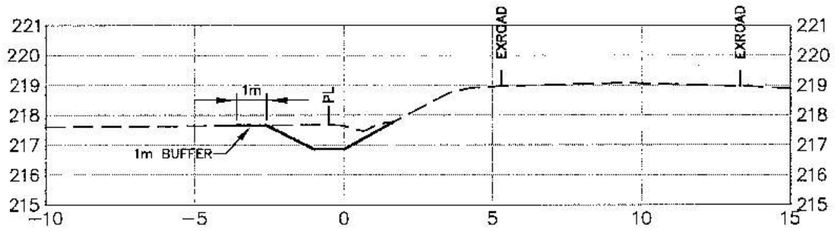

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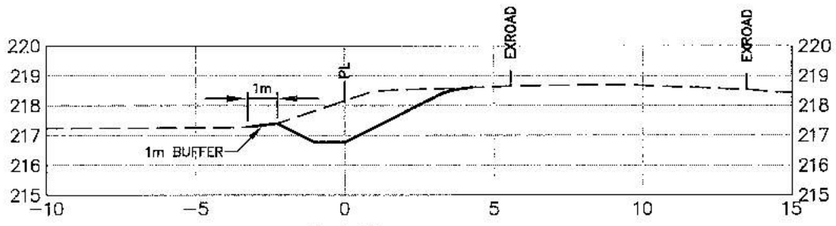

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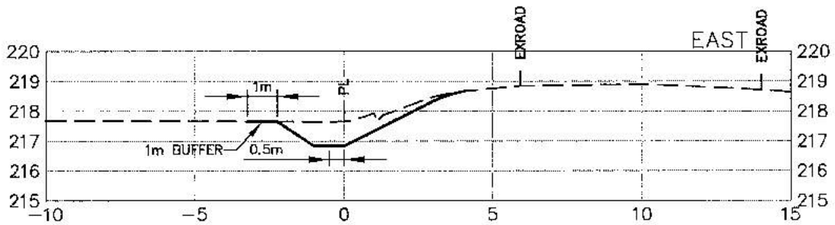

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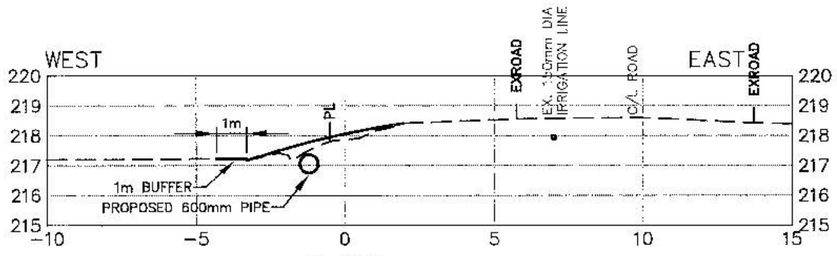

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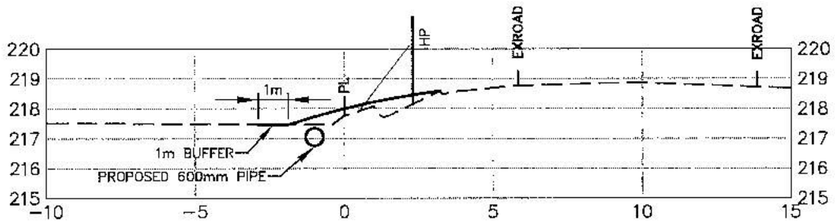

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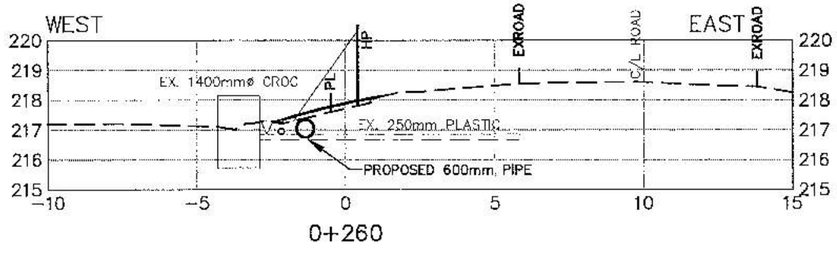

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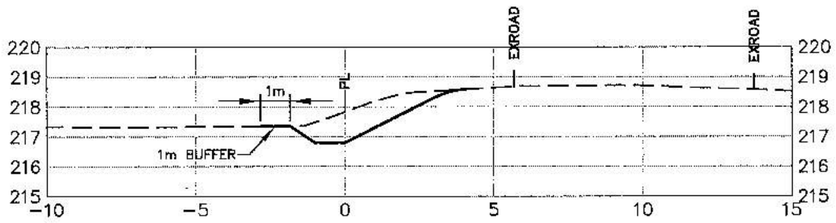


0+376

NOTES:
DITCH/DRAIN CENTRELINE IS 0.5m OUTSIDE OF PROPERTY LINE STA. 0+250 TO 0+481

TRANSITION STA. 0+481 TO 0+500

THEN AT PROPERTY LINE FROM STA. 0+500 TO 0+700

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42984012
PROVINCE OF ONTARIO

0 2 4m
(SCALE 1 : 200)
HORZ.
0 2 4m
(SCALE 1 : 200)
VERT.
SCALE (ON 11x17)

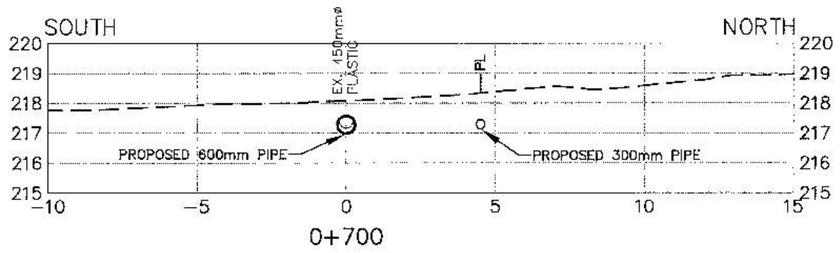
RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH CROSS SECTIONS

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — BLOOMRY

SEPT. 18, 2020
JOB NUMBER: 19-034



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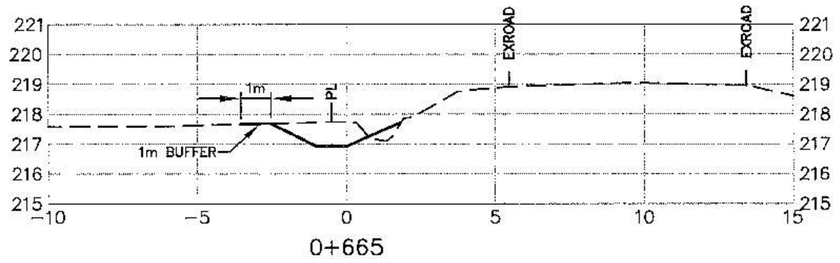

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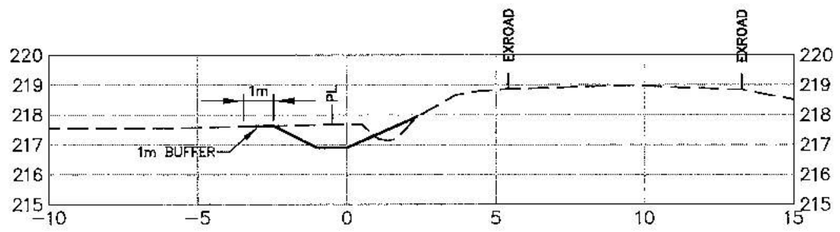

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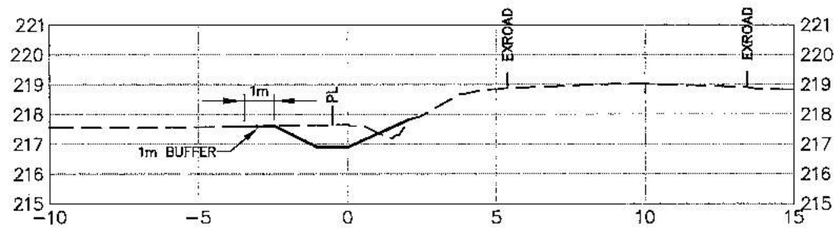

0+604

DESIGNED BY: K.A.S.

DRAWN BY: N.M.B.

CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER — K.A. SMART — 42564012 — PROVINCE OF ONTARIO

0 2 4m
(SCALE 1 : 200)
HORZ.
0 2 4m
(SCALE 1 : 200)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

RIVER ROAD NORTH BRANCH CROSS SECTIONS

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

SEPT. 18, 2020

JOB NUMBER: 19-034

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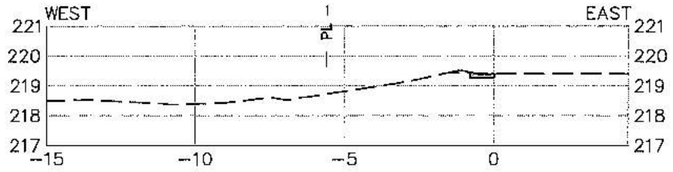

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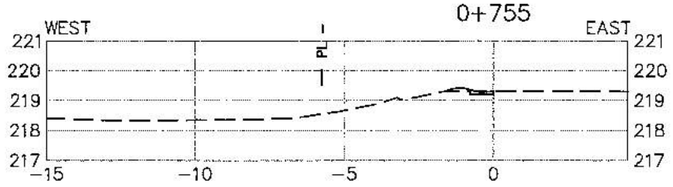

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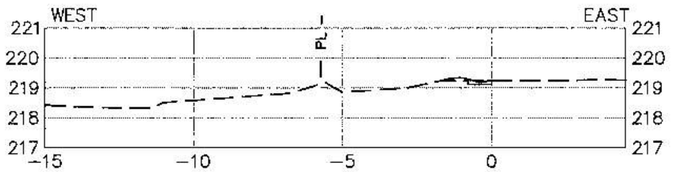

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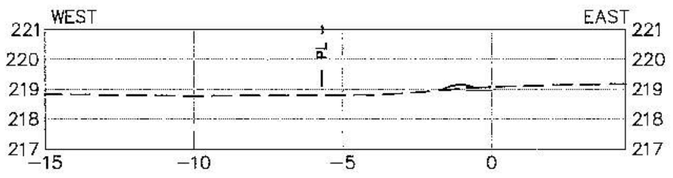

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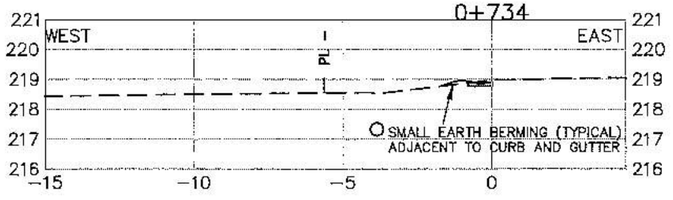

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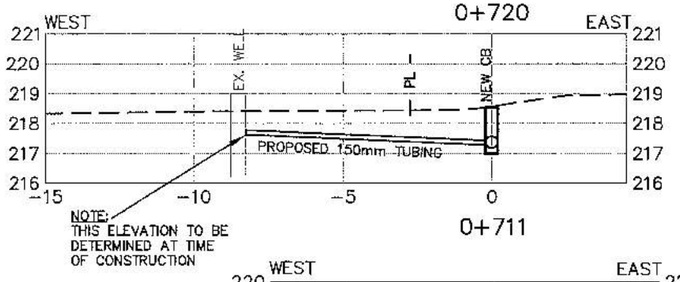

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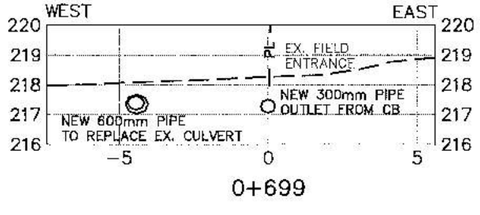

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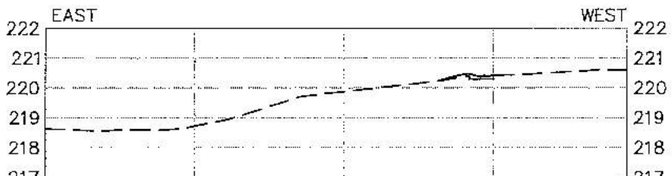

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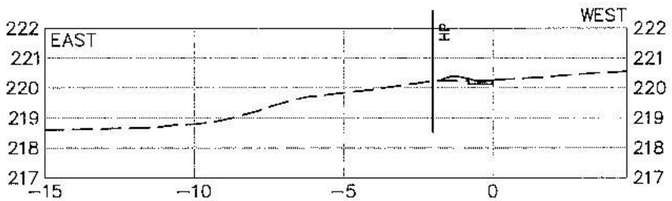

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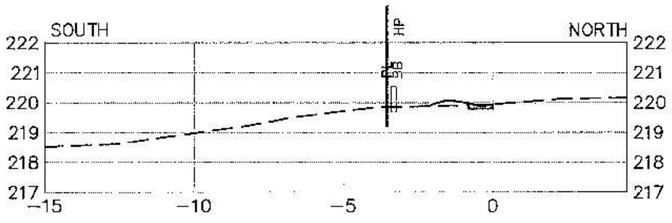

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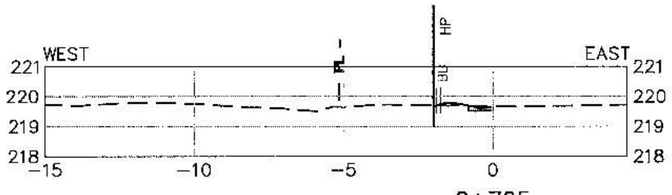

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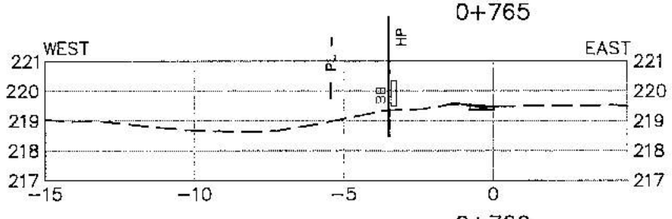


0+760

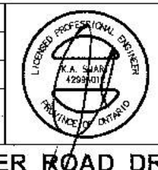
LEGEND

– NEW CURB AND GUTTER WITH BERM

DESIGNED BY: K.A.S.

DRAWN BY: N.M.B.

CHECKED BY: K.A.S.



0 2 4m
(SCALE 1 : 200)
HORZ.

0 2 4m
(SCALE 1 : 200)
VERT.

SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

CROSS SECTIONS
RIVER ROAD NORTH BRANCH
PETHERICK PROPERTY

SEPT. 18, 2020

REVISED:

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — BARRIE — GUELPH — SUDBURY

JOB NUMBER: 18-034

DRAWING
29 OF 34

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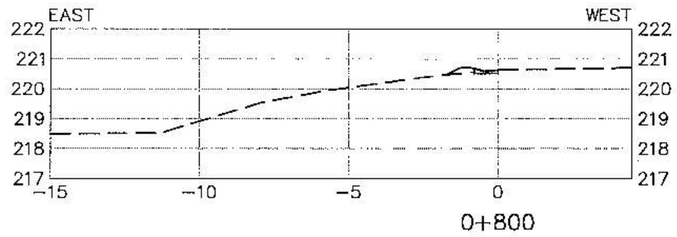

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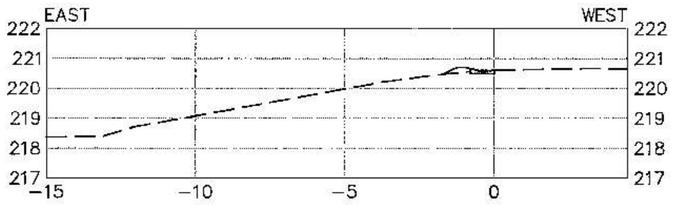

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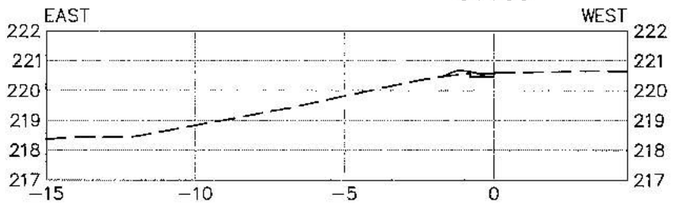

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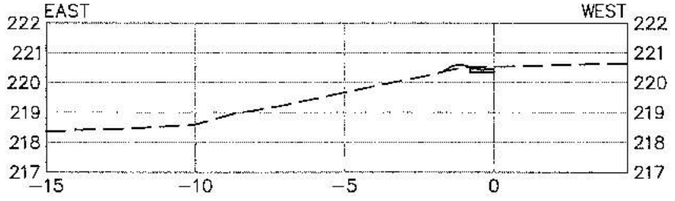

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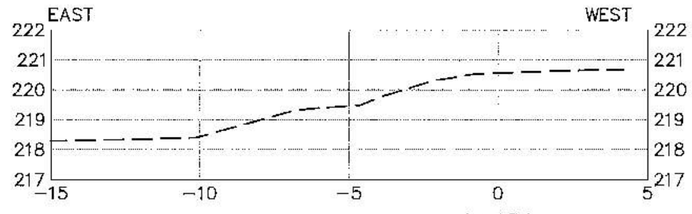

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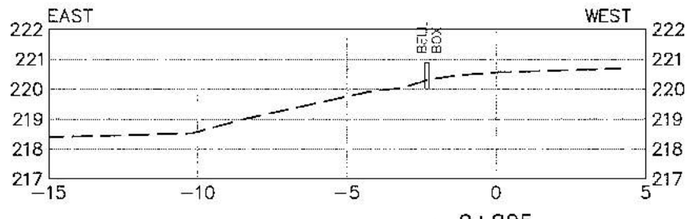

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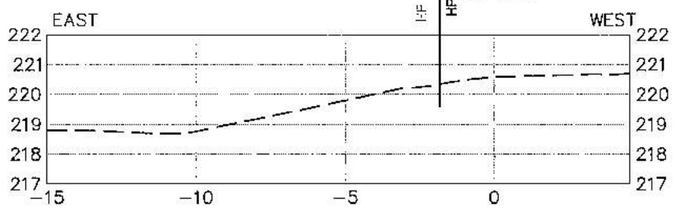

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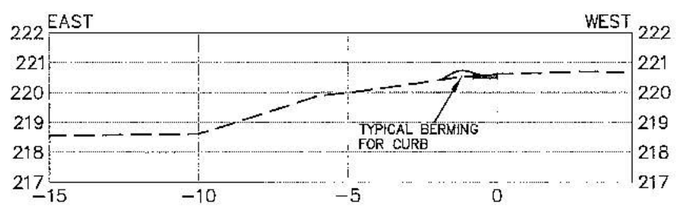


0+804

LEGEND

– NEW CURB AND GUTTER WITH BERM

DESIGNED BY: K.A.S.

DRAWN BY: N.M.B.

CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K. SMART
90394012
PROVINCE OF ONTARIO

0 2 4m
(SCALE 1 : 200)
HORZ.
0 2 4m
(SCALE 1 : 200)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

CROSS SECTIONS
RIVER ROAD NORTH BRANCH
PETHERICK PROPERTY

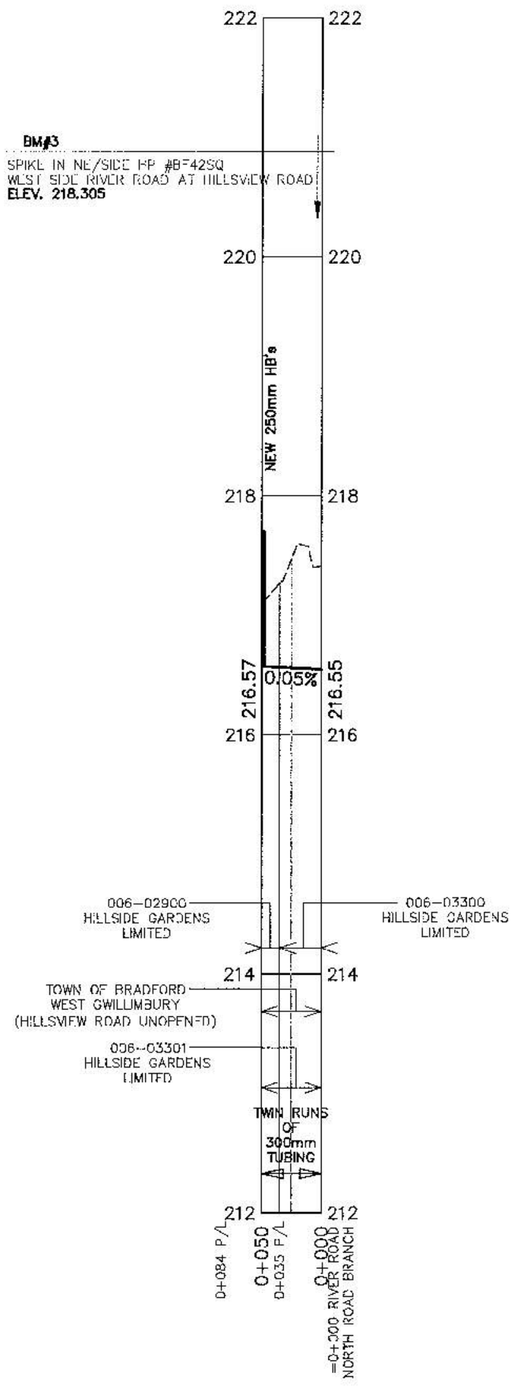
SEP. 18, 2020

REVISED:

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER BARRIE

JOB NUMBER: 19-034

DRAWING
30 OF 34



HILLSVIEW ROAD WEST BRANCH

LEGEND

--------- EXISTING GROUND ABOVE DRAIN

——————— PROPOSED GRADE LINE

DESIGNED BY: K.A.S.

DRAWN BY: N.M.B.

CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42994012
PROVINCE OF ONTARIO

0 50 100m
(SCALE 1 : 5000)
HORZ.
0 0.5 1m
(SCALE 1 : 50)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD WEST BRANCH

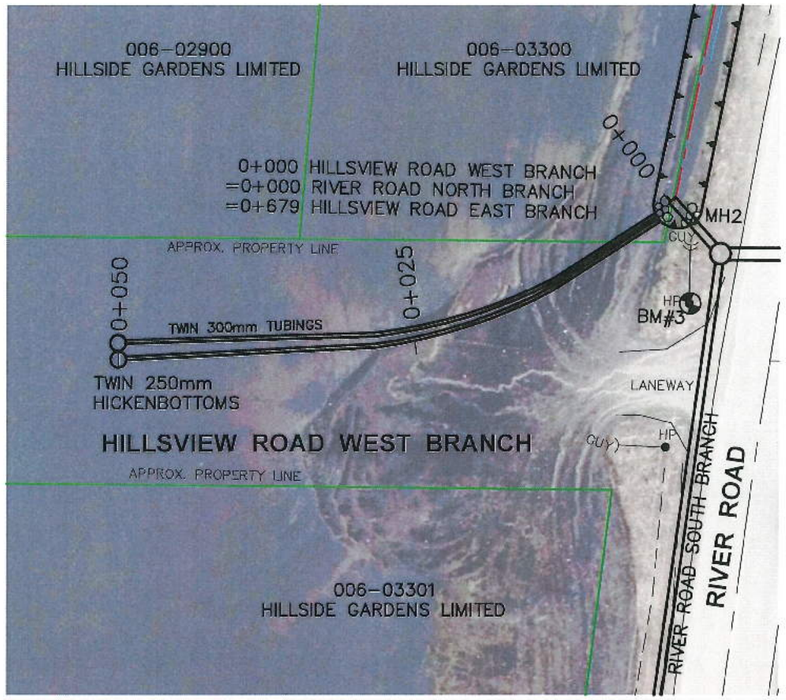
SEPT. 18, 2020

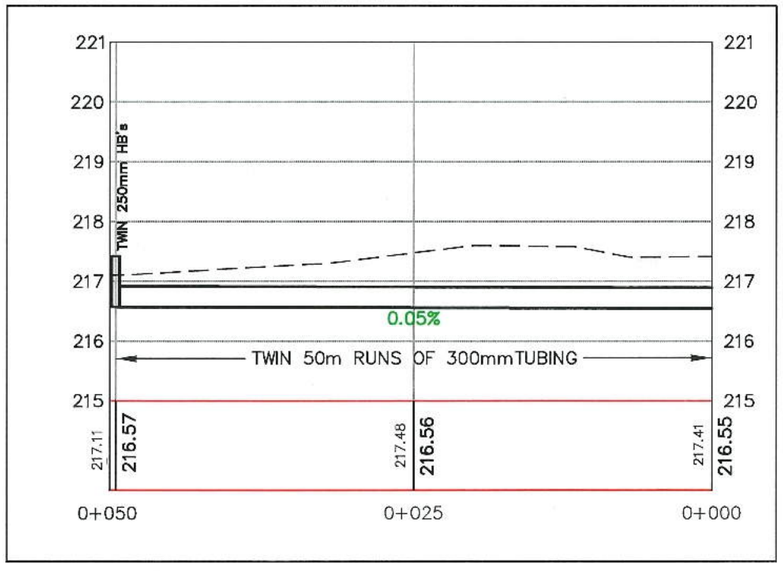
REVISED:

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

JOB NUMBER: 19-034

DRAWING
31 OF 34





BM#3
SPIKE IN NE/SIDE HP #BF42SQ
WEST SIDE RIVER ROAD AT HILLSVIEW ROAD
ELEV. 218.305m

LEGEND

- PROPERTY LINE (PLAN)
- EXISTING GROUND AT DRAIN (PROFILE)
- PROPOSED C/L OF TUBING (PLAN)
- PROPOSED TUBING (PROFILE)
- RIPRAP

NOTES:
LOCATION OF 300mm TUBINGS AND HICKENBOTTOMS TO BE FINALIZED WITH LAND OWNER AT TIME OF CONSTUCTION

ENSURE A RODENT GATE IS INCLUDED WITH EACH TUBING FOR USE AT THE OUTLET

IN LIEU OF THE TWIN TUBINGS A NEW SWALE COULD BE CREATED AND GRADED FROM ELEV. 217.10 AT STA. 0+050 TO ELEV. 217.00 AT STA. 0+000 OR A COMBINATION OF A SWALE AND SHORTER LENGTH OF 300mm TUBING COULD BE USED. IF A COMBINATION SYSTEM WERE USED THE TUBING SHOULD BE CHANGED TO 300mm HDPE PIPE

AT TIME OF CONSTRUCTION ENGINEER WILL CONFIRM WORK TO BE DONE WITH LANDOWNER, IF DIFFERENT FROM WHAT IS SHOWN HERE

DESIGNED BY: K.A.S.
DRAWN BY: N.M.B.
CHECKED BY: K.A.S.

LICENSED PROFESSIONAL ENGINEER
K.A. SMART
42988012
PROVINCE OF ONTARIO

0 5 10m
(SCALE 1 : 500)
HORZ.
0 1.0 2m
(SCALE 1 : 100)
VERT.
SCALE (ON 11x17)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

HILLSVIEW ROAD WEST BRANCH 0+000 TO 0+050

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

SEPT. 18, 2020
JOB NUMBER: 19-034

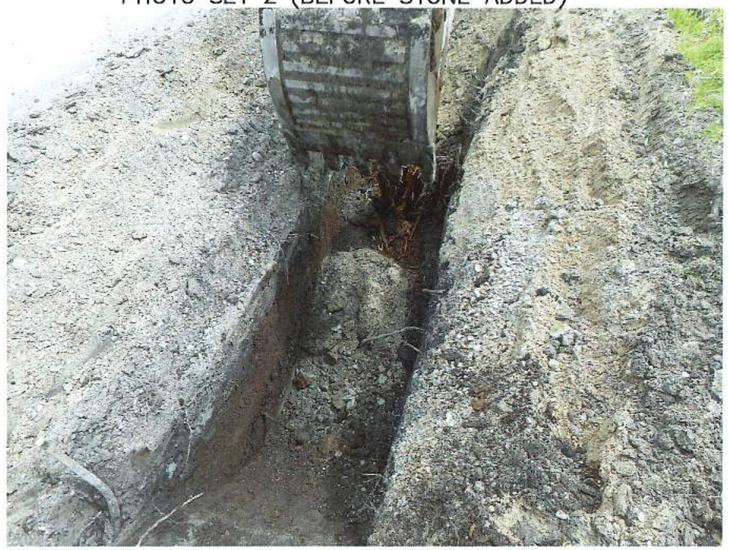
\\server\ksdata\Data\2019\19-034\Drafting\PETHERICK BRANCH 19-034.dwg HILLSVIEW RD WEST BR STA 000 16-Sep-20 4:11:48 PM

TRENCH INVESTIGATIONS – NO STONE, NO FILTER

PHOTO SET 1

TRENCH INVESTIGATIONS – CRUSHED STONE, NO FILTER

PHOTO SET 2 (BEFORE STONE ADDED)



TRENCH INVESTIGATIONS – CRUSHED STONE, FILTER FABRIC

PHOTO SET 3

NOTE:
THESE TEST HOLES WERE DONE ALONGSIDE SERVICE ROAD (WEST ROAD) ON EAST SIDE OF HWY 400

PEAT DEPTHS AND UNDERLYING SOILS ARE SIMILAR TO RIVER ROAD SITE

THESE TEST HOLES SHOW A VERTICAL 1 METER DEEP TRENCH WAS EXCAVATED IN THE PEAT AT THESE DIFFERENT LOCATIONS (200m APPART)

ONE OF THE HOLES HAS NOTHING PUT IN (PHOTO SET 1)

A SECOND HAD 19mm CRUSHED LIMESTONE (NOT SHOWN IN THE PHOTO) AS A TRIAL

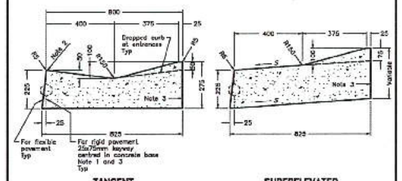
THE THIRD HAD A GEOTEXTILE LINING AND THEN THE LIMESTONE (PHOTO SET 3)

RIVER ROAD DRAIN

COUNTY OF SIMCOE TOWN OF BRADFORD WEST GWILLIMBURY

DESIGNED BY: K.A.S.		TRENCH INVESTIGATION PHOTOS	SEPT. 18, 2020
DRAWN BY: N.M.B.		K. SMART ASSOCIATES LIMITED CONSULTING ENGINEERS AND PLANNERS KITCHENER SUDBURY	REVISED:
CHECKED BY: K.A.S.			JOB NUMBER: 19-034
			DRAWING 33 OF 34

\\server\ksdata\Data\2019\19-034\Drafting\TRENCH INVESTIGATION PHOTOS 19-034.dwg TRENCH PHOTOES 16-Sep-20 3:20:32 PM

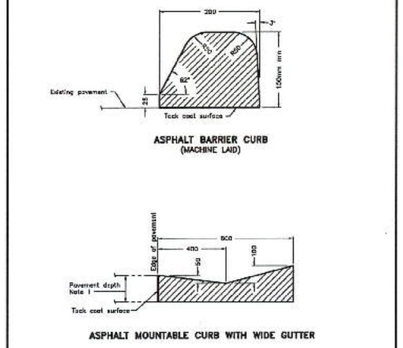


LEGEND:
S – Rate of pavement superelevation in percent, %.

NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this drawing shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.

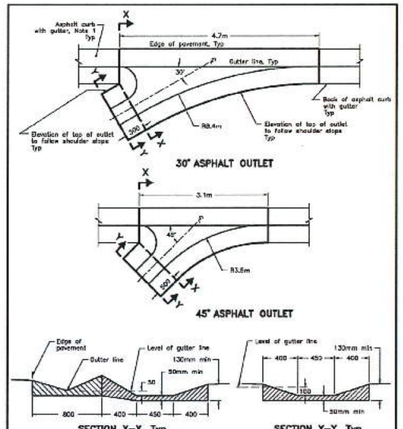
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 810 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE MOUNTABLE CURB WITH WIDE GUTTER		OPSD 600.030



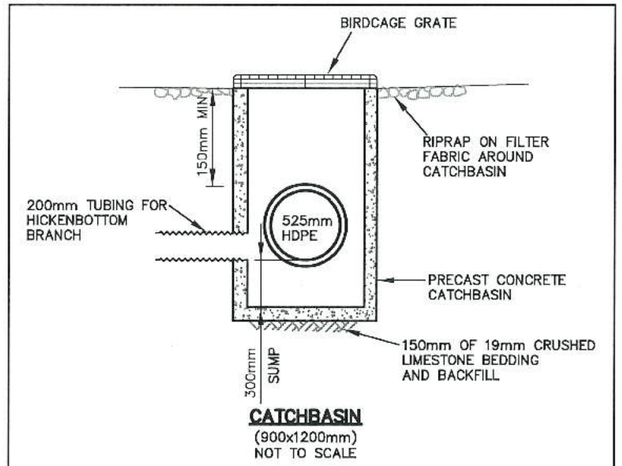
NOTES:
1 Depth of asphalt curb with gutter at pavement edge shall equal depth of new pavement, but in no case less than 150mm.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 2
ASPHALT CURB AND ASPHALT CURB WITH GUTTER		OPSD 601.010

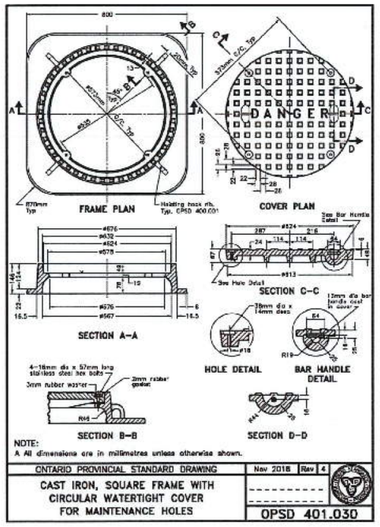


NOTES:
1 For asphalt curb with gutter refer to OPSD 601.010.
A For asphalt spillway details refer to OPSD 605.040.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 2
30° AND 45° ASPHALT OUTLETS FOR ASPHALT CURB WITH GUTTER		OPSD 605.020

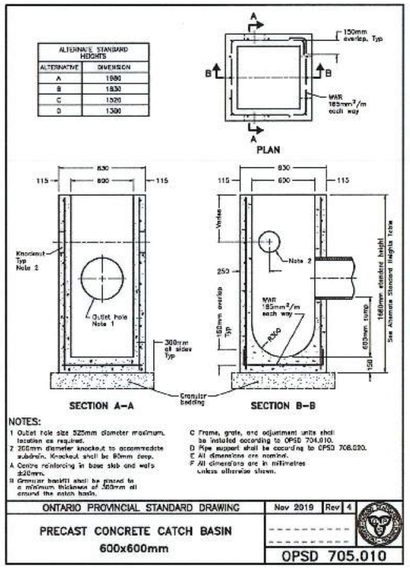


NOTES:
1. THE GRATE SHALL BE SECURELY FASTENED TO THE CATCHBASIN WITH RUST RESISTANT ANCHORS.
2. GRATE TO BE BIRDCAGE GRATE
3. REFER ALSO TO ISP 8.02 FOR DETAILS



NOTE:
A All dimensions are in millimetres unless otherwise shown.

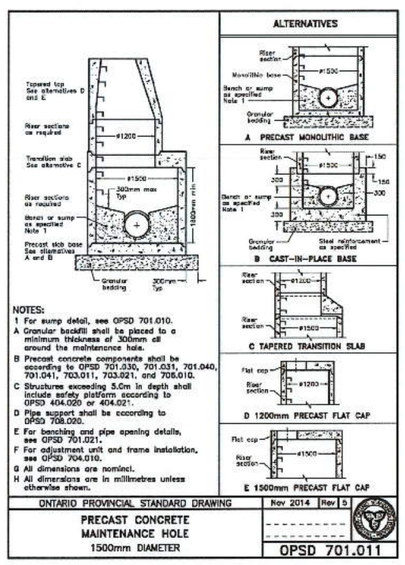
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CAST IRON, SQUARE FRAME WITH CIRCULAR WATERTIGHT COVER FOR MAINTENANCE HOLES		OPSD 401.030



ALTERNATE STANDARD HEIGHTS	
ALTERNATIVE	DIMENSION
A	1080
B	1830
C	1520
D	1300

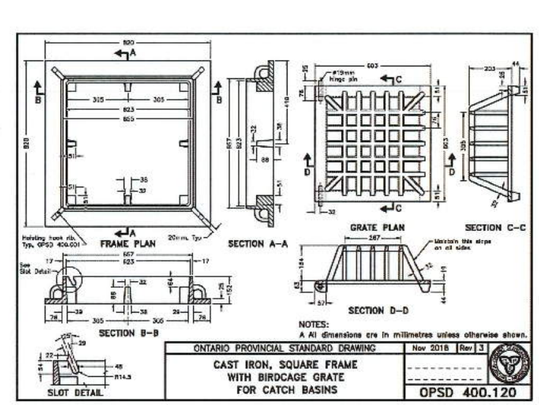
NOTES:
1 Outlet hole size 525mm diameter maximum, location as required.
2 250mm diameter knockout to accommodate subdrain. Knockout shall be 80mm deep.
A Centre reinforcing in base slab and walls @200mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE CATCH BASIN 600x600mm		OPSD 705.010



NOTES:
1 For sump detail, see OPSD 701.010.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, 701.040, 701.041, 703.011, 703.021, and 705.010.
C Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020 or 404.021.
D Pipe support shall be according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1500mm DIAMETER		OPSD 701.011



NOTES:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
CAST IRON, SQUARE FRAME WITH BIRDCAGE GRATE FOR CATCH BASINS		OPSD 400.120

PHOTO OF TYPICAL BIRDCAGE GRATE REQUIRED ON 900x1200mm CATCHBASIN

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42954012
PROVINCE OF ONTARIO

RIVER ROAD DRAIN

COUNTY OF SIMCOE — TOWN OF BRADFORD WEST GWILLIMBURY

OPSD DRAWINGS AND CATCHBASIN DETAIL

SEPT. 18, 2020

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

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DRAWING 34 OF 34