Report No: P&F 3/2024

PROPERTY & FIRE REPORT

To: Council

Meeting Date: July 9, 2024

Prepared by: Amy Harron
Deputy Clerk

Date Prepared: July 2, 2024

Subject: Lebold Drain Engineer's Report

Recommendation:

That the Council of the Township of Wellesley accept the Engineer's Report dated May 30, 2024, for the Lebold Drain for construction of a new closed drain; and further

THAT By-law 29/2024, as attached to the agenda, be given first and second reading to provisionally adopt the Report if the Petitions remain valid after consideration of the Report; and further

THAT the date of the Court of Revision be scheduled for Tuesday, August 6th, 2024, at 5:00p.m., at the Council Chambers, 4805 William Hastings Line if By-law 29/2024 is provisionally adopted, with the following three members of Council appointed:_____ _____, _____and_____.

Summary:

This report is prepared pursuant to Section 4 of the Drainage Act R.S.O. 1990. On November 18, 2005, the Township received the first petition under Section 4 of the Drainage Act for an enclosure of an existing private open ditch. At an on-site meeting on May 5, 2008, additional signatures were added to the petition. The Township received one final petition under Section 4 of the Act on May 14, 2024, the Township appointed K. Smart Associates Limited to prepare one report with respect to the petitions.

Report:

Pursuant to the requirements of the Drainage Act, notice of this meeting and copies of the Engineer's Report (attached) were forwarded to the assessed lands and roads, as well as any affected public agencies, as required.

Assessed landowners and all other affected parties will be given the opportunity to ask questions and voice any concerns relating to the Report. The Drainage Engineer will respond to any questions that may arise from ratepayers and/or Council. At the conclusion of the meeting, there will be an opportunity for affected owners to add or withdraw their names from the petition.

As per the Drainage Act, if the petitions remain valid as per Section 4(1) at the conclusion of the meeting, Council may proceed by giving first and second reading to By-law 29/2024, as attached to this agenda, to provisionally adopt the report.

Staff, in consultation with the Drainage Engineer propose a Court of Revision to be held on August 6th, 2024.

Township Strategic Plan:

This initiative aligns with the strategic plan Infrastructure Improvement & Management to refine and improve upon current practices via improved records keeping, asset management, assessment, and the introduction of best practices where applicable.

Financial Implications:

Schedule A, Schedule of Assessments within the Lebold Drain Engineer's Report provides a total assessment for the drainage works of $410,000.00. The estimated Township of Wellesley assessment is $71,224.00.

Other Department / Agency Comments:

N/A

Legal Considerations:

N/A

Attachment(s):

Lebold Drain Engineer's Report

Approved By:

Rik Louwagie, Chief Administrative Officer

ENGINEERING REPORT

For

LEBOLD DRAIN

Township of Wellesley

Region of Waterloo

Date: May 30, 2024

File No. 06-146

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS & PLANNERS

85 McIntyre Drive
Kitchener, ON N2R 1H6

584 Clinton Avenue, Unit 2
Sudbury, ON P3B 2T2

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Definitions:

"Act" means The Drainage Act R.S.O. 1990
"CSP" means corrugated steel pipe
"*Drainage Guide*" means *A Guide for Engineers working under the Drainage Act in Ontario,* (OMAFRA Publication 852, 2018)
"DFO" means Fisheries and Oceans Canada
"Drain" means Lebold Drain
"Grant" means provincial grant as per Section 85 of the Act
"Grant Policy" means OMAFRA Agricultural Drainage Infrastructure Program Administrative Policies
"HDPE" means high-density polyethylene
"Municipal Drain" means a drainage works constructed under the Act
"Municipality" or "Township" means Township of Wellesley
"OMAFRA" means the Ontario Ministry of Agriculture, Food and Rural Affairs
"Tribunal" or "Drainage Tribunal" means Agriculture, Food and Rural Affairs Appeal Tribunal
"ø" means diameter

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May 30, 2024 File No. 06-146

LEBOLD DRAIN

TOWNSHIP OF WELLESLEY

1 EXECUTIVE SUMMARY

This report is prepared pursuant to Section 4 of the Drainage Act R.S.O. 1990.

On November 18, 2005 the Township of Wellesley received a petition from Terry Lebold of Lebold Farms Inc. for an enclosure of the existing private open ditch servicing lands in Lot 5, Concession 3, in the Township of Wellesley.

At the On-Site Meeting, the additional signatures of Owen and Sarah Bauman (for the W ½ Lot 6, Concession 3 and the E ½ Lot 6, Concession 3), as well as Darrell and Dennis Erb (for the W ½ Lot 7, Concession 3) were added to the petition.

Prior to the completion of the report, the Township received an additional petition signed by Allan & Linda Erb and Kingwood Holsteins Ltd. (for the NE ¼ Lot 7, Concession 2). On May 14, 2024, as per Section 8(4) of the Act, KSAL was appointed by resolution of Council to prepare one report with respect to the two petitions.

To address the petitions received, this report recommends the following:

Main Drain

- 47m of ditch bottom cleanout and construction of a permanent stilling pool.
- Enclosure of 796m of existing private open ditch with 525mmø to 450mmø concrete tile.
- Installation of 1,316m of additional closed concrete tile (450mmø to 250mmø).
- 17m of 300mmø HDPE crossing of Lichty Road by open cut.
- Four (4) – 900x1200mm concrete catchbasins and three (3) – 600x600mm concrete catchbasins.

Branch 1

- 25m of solid plastic tubing, two (2) – 900x1200mm concrete catchbasins and 19m of 525mmø HDPE crossing of Deborah-Glaister Line by open cut.

The estimated cost of this project is $410,000.

The watershed served is approximately 109.5 hectares (271 acres).

The following assessment schedules/appendices are included for construction and future maintenance of the drainage works.

- Schedule A shows the assessment of the total estimated cost
- Schedule B is for prorating future maintenance cost
- Schedule C is for levying the final cost of the Drain.
- Appendix A illustrates the calculation of the assessments outlined in Schedules A and B.

2 BACKGROUND

On November 18, 2005 the Township received a petition under Section 4 of the Drainage Act from Terry Lebold of Lebold Farms Inc. (Roll No. 007-06600) for an enclosure of the existing private open ditch servicing lands in Lot 5, Concession 3, in the Township of Wellesley. Pursuant to Section 8 of the Act, on April 3, 2006, K. Smart Associates Limited was appointed by resolution of Council to prepare a report on the petition received.

The original On-Site Meeting for the petition occurred on May 5, 2008.

At the On-Site Meeting, the additional signatures of Owen and Sarah Bauman (for the W ½ Lot 6, Concession 3 and the E ½ Lot 6, Concession 3) (Roll No.'s 007-06700 & 007-06800), as well as Darrell and Dennis Erb (for the W ½ Lot 7, Concession 3) (Roll No. 007-06900) were added to the petition.

On June 24, 2008 the engineer held a meeting on site with the Grand River Conservation Authority (GRCA). At this time, the requested work met opposition from the GRCA, in coordination with Fisheries and Oceans Canada (DFO), which ultimately led to the stalling of the project.

Prior to the completion of the report, the Township received a petition under Section 4 of the Act signed by Allan & Linda Erb, and Kingwood Holsteins Ltd. (Roll No. 007-07200) for an outlet to the NE ¼ of their property located in Pt. Lot 7, Concession 2. On May 14, 2024, as per Section 8(4) of the Act, KSAL was appointed by resolution of Council to prepare one report with respect to the two petitions.

3 DRAINAGE HISTORY

No Drain, by way of a by-law under the Drainage Act, has ever existed for the watershed of the proposed Lebold Drain.

An award drain referred to as the "Lichty Award Drain" was constructed in 1931, and though only a profile (no plan) was able to be located, it is believed that the extents of the Lichty Award Drain is the open ditch commencing at Chalmers-Forrest Road, at the N ½ Lot 3, Concession 3, continuing upstream through Lots 4 and 5. Near the east side of Lot 5 a 12"ø tile continued into Lot 6 to a catchbasin

just downstream of a depressional area (this would appear to be the same depressional area located east of the A. Bauman laneway, at the middle of Lot 6, Concession 3). From this catchbasin a 10"ø tile continued easterly to a location short of Lichty Road.

In November 1987, the Township of Wellesley received a petition under the Drainage Act signed by Richard Lichty, Ronald Lebold, and Larry Erb. Accompanying the petition was a letter requesting *"to replace existing award drain on Lot 6 constructed in 1931, and to extend drain on to Lot 7. Also to incorporate previously constructed drain on part of Lot 6 and Lot 5 into a municipal drain."* On November 17, 1987, K. Smart Associates Limited was appointed under the Drainage Act, however, shortly after holding a meeting with the petitioners, all three owners withdrew their names from the petition. No further work occurred under the Drainage Act until the current petition was received.

It is unclear when the abovementioned privately constructed drain was installed. However, through site investigation, the privately constructed drain would appear to be a 350mmø concrete tile commencing at the laneway to the Lebold Farms Inc. property (middle of Lot 5, Concession 3), extending upstream into the A. Bauman property, ending at the laneway. This privately constructed tile, therefore, likely replaced a portion of the original award drain tile, prior to 1987.

Tile plans provided for each of the T. & B. Bauman, Lebold Farms Inc., and A. Bauman farms each show near complete systematic tile drainage for the portions of the farms served by this Lichty Award (proposed Lebold Drain) watershed.

4 INITIAL ON-SITE MEETING & SURVEY

On May 5, 2008, an on-site meeting was held in accordance with Section 9(1) and 9(2) of the Act.

At the meeting, both the Bauman's and Erb's expressed an interest in expanding the scope of the proposed drainage project, and as stated above, both owners signed the original petition in May 2008.

The route of the proposed drain was examined after the on-site meeting. An initial topographic survey was completed in June 2008, for the extents of the existing private ditch and proposed new tile drain, starting at the E ½ of Lot 4, Concession 3 to the W ½ of Lot 7, Concession 3.

4.1 Watershed Description

The perimeter watershed of the Drain has been established based on site investigation, open source LiDAR Digital Elevation Model (DEM) data, available tile plans and neighbouring historical drain reports.

The proposed Lebold Drain is neighboured by the Albrecht Drain to the south, the Kingwood Drain to the west, and the Lichty-Lebold Drain to the north. The most

recent improvements to each drain occurred in 2012, 2004, and 1988, respectively. Each under reports by J. W. Kuntze, P. Eng.

Land use in the watershed is predominately agricultural except for road allowances, scattered bush areas and two (2) residential lots.

5 AUTHORITY FOR REPORT

Section 4 of the Drainage Act provides for the construction of new drainage works for an area requiring drainage. As a result of discussions at the site meeting and follow up site examination, the area requiring drainage for the original 2006/2008 petition was determined to be the following:

- The approximate 312m length of existing open ditch from the westerly limits of Lot 5, Concession 3 to the midpoint of the Lot, and the surface water flow path located above a privately constructed 350mmø tile from this midpoint of Lot 5, Concession 3 easterly to Lot 6.
- The area requiring drainage continues with the S ⅓ of Lot 6, Concession 3 for the purpose of improved subsurface water drainage and surface water control, and the acquisition of a legal drainage outlet for existing private tile drainage systems.
- The area requiring drainage concludes with the SW ¼ of Lot 7, Concession 3 (approximate 11.1 hectares) for the control of surface water entering the property from the southeasterly neighbouring properties, as well as obtaining a legal drainage outlet for a future private tile drainage system on the petitioner's property.

The signatures on the petition represent greater than 60% of the hectarage in the area requiring drainage; thus, the petition is valid under Section 4(1)(b) of the Act.

The official on-site meeting for the Allan & Linda Erb, and Kingwood Holsteins Ltd. petition was held at a meeting on May 28, 2024 (outlined in *Section 8.4 On-Site Meeting: Allan and Linda Erb & Kingwood Holsteins Ltd Petition*). The engineer determined that the area requiring drainage for the petition was:

- The NE ¼ of Lot 7, Concession 2 for the purpose of improved subsurface water drainage to acquire a better drainage outlet for an existing private tile drainage system.

The signatures on the petition represent greater than 60% of the hectarage in the area requiring drainage; thus, the petition is valid under Section 4(1)(b).

6 ENVIRONMENTAL CONSIDERATIONS

6.1 Agency Notification

Contact was made with the Grand River Conservation Authority and DFO during the process of preparing this report.

6.2 Agency Responses

6.2.1 Grand River Conservation Authority

On June 24, 2008 the engineer held a meeting on site with the Grand River Conservation Authority (GRCA). At this time, the requested work met opposition from the GRCA, in coordination with Fisheries and Oceans Canada (DFO), which ultimately led to the stalling of the project.

Through January/February 2021, at the request of several owners, discussions with GRCA regarding the Lebold Drain project was re-initiated by the engineers. GRCA advised that should the project continue under the Drainage Act, they would not require a permit for the work (under Ontario Regulation 150/06). The Conservation Authority did provide advisory comments that have been addressed in this report. A summary of the comments received are as follows:

- GRCA advised that the 'private drainage ditch' on Mr. Bauman's property is a mapped watercourse which is currently unclassified, possibly intermittent, and could potentially support a mixed (warm-cool) water fish community at best. They recommended that DFO be consulted.
- GRCA is generally not supportive of watercourse enclosures, but an Ontario Regulation 150/06 permit would not be required if the works are completed under the Drainage Act.
- There is a shallow marsh on the east side of the road. GRCA does not support partial or complete draining of wetlands, but again, would not require permits or authorization from landowners for installing tile drains.

6.2.2 DFO

Following the advice of GRCA, a Request for Review was submitted to DFO along with a project description and drawing package on April 3, 2021. On June 29, 2022, a site visit was completed with the engineers and DFO staff to review the proposed enclosure. Following the site visit, a response from DFO was received on September 21, 2022. The response indicated that if the following list of recommended avoidance/mitigation measures were implemented, then:

"The proposal is not likely to result in the contravention of the Fisheries Act/Species at Risk Act prohibitions" (simplified: death/destruction/harmful alteration etc., of fish and/or fish habitat).

DFO recommended measures to implement are as follows:

- *Time in water work to respect timing windows to protect fish…….The protective timing window for the area of this project is March 15th – July 15th.*

- *Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project.*
    - *Work when both the enclosure area and the upstream watercourse areas of the drain are completely dry:*
    - *Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation;*
    - *Remove all construction materials from site upon project completion.*

7 PRELIMINARY DESIGN

Through various private discussions with landowners, and the use of the original survey, a preliminary design was prepared, along with draft costing and assessments. The following is a general summary of the preliminary design prepared and presented to the owners, in order to determine the remaining interest in pursuing the full project scope, originally discussed with the petitioners back in 2008:

T. & B. Bauman (Roll No. 007-06400)

- Enclosure of approximately 460m of existing open ditch with a 525mmø concrete tile.
- Construction of a permanent stilling basin at the outlet of the proposed tile drain (south corner of the bush/woodlot) and approximately 40m of downstream ditch bottom cleanout.

Lebold Farms Inc. (Roll No. 007-06600)

- Enclosure of approximately 300m of existing open ditch with a 450mmø concrete tile from the western limits to the laneway.
- Install approximately 300m of 350mmø concrete tile alongside the existing private 350mmø concrete tile to be incorporated.
- Catchbasins proposed at both property lines and on the east side of the laneway.

A. & E. Bauman (Roll No. 007-06700 & 007-06800)

- Install approximately 215m of 400mmø concrete tile from the west property line to and across the laneway. The 450m of 350mmmø concrete tile to Lichty Road.
- Catchbasins on the east side of the laneway and west side of Lichty Road.

Lichty Road

- New 300mmø plastic pipe crossing of Lichty Road with a new catchabsin proposed on the east side of the road.

8 ADDITIONAL CONSULTATION & INVESTIGATION

8.1 Information Meeting

On November 15, 2023, a meeting was held with notice of the meeting sent to the petitioners and other owners along the proposed Drain alignment. The purpose of the meeting was to generally revive the project, and determine the exact scope of work requested by owners. The engineer briefly explained the history and the recent consultation with GRCA and DFO.

The following attended the on-site meeting:

Attendees:

Darrell Erb (Roll No. 007-06900)	Isaiah Bauman
Ammon H Bauman (Roll No. 007-06700 & 06800)	Terry Lebold (Roll No. 007-06600)
Owen Bauman	Curtis MacIntyre (K. Smart Associates)
Tobias Bauman (Roll No. 007-06400)	John Kuntze (Drainage Superintendent)

All owners in attendance were in favor with moving ahead with the project. Generalized comments from all attendees are listed below:

T. Bauman (Roll No. 007-06400)

- Tobias mentioned that he was still looking to extend/square off his manure pit adjacent to his barn. The engineer reviewed a plan showing a squared off manure pit with the proposed drain located 7.5m away (Township of Wellesley setback requirement). Both Tobias and the engineer agreed to locate the drain a little further away, even if it meant getting into the field tiles.

T. Lebold, Lebold Farms Inc. (Roll No. 007-06600)

- Terry could not recall the year when the existing 350mm dia. concrete tile was installed from the east limits of his property to the laneway.
- By the end of the meeting, all agreed that it made the most sense to install a new tile drain through this section, sized to the same drainage coefficient standard as the rest of the proposed Drain, instead of attempting to incorporate the existing tile.

A. & E. Bauman (Roll No. 007-06700 & 007-06800)

- Ammon agreed with the plan to take the alignment of the new drain through the middle of the field, instead of veering north towards the buildings.
- Ammon mentioned there is an existing catchbasin on the east side of his laneway that expels more water than it accepts.
- Ammon said they generally don't have a problem with water ponding in the depressional area on the east side of his laneway. The water that sits there drains away fairly quickly.

C. & D. Erb (Roll No. 007-06900)

- Darrell requested if the engineer could prepare an estimate to continue the new tile drain through his farm to the east edge of his property to address

surface water that comes across the east property line and culvert under the road.

- Upon receiving the estimate Darrell was in favor of proceeding with the proposed Drain through his property.

8.2 Additional Site Examination and Survey

A site inspection was performed after the November 15, 2023 on-site meeting by the engineer.

Roll No. 007-06600

- Significant cattail and vegetation growth observed in the existing ditch, west of the laneway.
- Existing small ditch along north side of bush is completely dry. Closer to the east limits of the property it is located along the edge of the field, though part way across the field it tucks slightly into the bush.
- Existing catchbasin on east property limit not likely positioned to admit surface water.

Roll No. 007-06700 & 007-06800

- Located covered catchbasin near tree stump along east side of laneway. Catchbasin is also not in a position to admit surface water. Lowest point of depressional area approx. 15m to the south of catchbasin.
- Existing plastic tile daylights at surface near road culvert at east limits of the property to admit surface water from Lichty Road culvert.

Roll No. 007-06900

- A GRCA designated wetland exists immediately to the east of culvert crossing on Lichty Road.
- Significant drainage issues (ponding water and tire rutting from machinery) was observed in the farm field, from the edge of the wetland to the east limits of the property.
- Majority of surface water on field likely enters from across the easterly property line, however, additional surface water also crosses through a 600mmø CSP culvert under Deborah-Glaister Line, located just west of east property line.

8.3 Information Letter To Watershed

Prior to the filing of the Report, a letter was prepared and sent to all owners assessed for the proposed Lebold Drain, outlining the proposed work and a brief history of the project. A copy of the of the watershed plan and draft Schedule C (schedule depicting anticipated net assessments after grant) was included.

The only comment received was from Gord Erb (Kingwood Holsteins Ltd.) and Allan Erb. Gord and Allan indicated a desire to extend the proposed Lebold Drain across Deborah-Glaister Line to provide a better outlet to their tile drainage system, currently drained out of the Lebold Drain watershed to the Albrecht Drain, and a potential future outlet for the approximate 5.9 hectare area located to the east of the

driveway (currently untiled). The details of the request were discussed at a site meeting on April 29, 2024. This led to the additional petition.

8.4 On-Site Meeting: Allan and Linda Erb & Kingwood Holsteins Ltd Petition

On May 28, 2024, a meeting was held for the Allan & Linda Erb, and Kingwood Holsteins Ltd. petition. The same details discussed at the April 29th site meeting were re-iterated.

This petition forms Branch 1 of the proposed Lebold Drain.

9 DESIGN CONSIDERATIONS

9.1 Sufficient Outlet

Section 15 of the Act requires that the proposed work be continued downstream to a sufficient outlet. Section 1 of the Act defines sufficient outlet as "a point at which water can be discharged safely so that it will do no damage to lands or roads." For this project, the private open ditch downstream of the proposed Lebold Drain tile provides sufficient outlet and will allow the proposed works to function as intended.

9.2 Drain Capacity

The size of the proposed tile drain was determined using the Drainage Coefficient Method outlined in the *Drainage Guide* for Ontario, published by OMAFRA. The drainage coefficient is a measure of the amount of runoff that a closed drain can remove from an upstream watershed in a 24-hour period. Based on our watershed examination and landowner discussions, the proposed tile drains on this project have been designed for a 25mm (1.0") drainage coefficient.

For the crossing of Deborah-Glaister Line by Branch 1, as an alternative to constructing a small diameter Lebold Drain pipe for the purpose of subsurface drainage, alongside the existing surface road culvert, the project proposes to construct a single pipe for both purposes. The crossing will include catchbasins on either side of the road and be at a depth sufficient for tile drainage. Due to this, the crossing of Deborah-Glaister Line has been sized for the approx. 10-year storm.

9.3 Soil Conditions

A review of the 1996 report titled: "State of the Resources: Improving the Land Resources Data Base – The Regional Municipality of Waterloo Soil Information Upgrade" indicates that there are two (2) primary soils adjacent to the Drain; Huron (St. Clements) Loam in the area of the proposed private open ditch enclosure, and Bennington (Bookton) Loams for the upstream proposed tile drain. Huron loams are fine textured soils formed on till or lacustrine deposits, and the St. Clements series contain a silty clay loam as the dominant soil texture. The series is described as having imperfect drainage. Bennington loams are coarse and medium-textured soils, 1 to 3 feet deep, overlying fine textured till and lacustrine deposits. The Bookton series is a sand over clay dominant soil texture, with good drainage.

Based on available information, adverse subsurface conditions are not expected on this project, and the use of conventional construction equipment is anticipated. Refer to the Standard Specifications for drain construction procedures when adverse subsurface conditions are encountered.

10 RECOMMENDED WORK

A description of the Drain for construction and future maintenance is as follows:

10.1 Main Drain

T. & B. Bauman (Roll No. 007-06400)

- 57m of ditch bottom cleanout and the construction of a permanent stilling basin (10m long, 0.5m deep).
- 478m of 525mmø concrete tile, including 6m of 525mmø solid plastic outlet pipe with rodent gate at outlet.
- 484m of existing ditch backfilled and graded into an overflow swale.
- 900x1200mm concrete catchbasin and berm at the east property line.

Lebold Farms Inc. (Roll No. 007-06600)

- 621m of 450mmø concrete tile.
- 300m of existing ditch backfilled and graded into an overflow swale.
- 900x1200mm concrete junction box at laneway and a 900x1200mm ditch inlet catchbasin and berm at the east property line.

A. & E. Bauman (Roll No. 007-06700 & 007-06800)

- 214m of 450mmø, and 432m of 350mmø concrete tile.
- 900x1200mm concrete catchbasin at the laneway and a 600x600mm catchbasin at the east property line (at Lichty Road), with 2m^2 of riprap.

Township of Wellesley (Lichty Road)

- 17m of 300mmø HDPE pipe crossing of Lichty Road by open cut.
- 600x600mm catchbasin on east side of road, with 2m^2 of riprap.

C. & D. Erb (Roll No. 007-06900)

- 282m of 300mmø, and 79m of 250mmø concrete tile.
- 600x600mm concrete catchbasin and berm at the east property line.

10.2 Branch 1

C. & D. Erb (Roll No. 007-06900)

- 25m of 200mmø solid plastic tubing connected to the Main Drain.
- 900x1200mm concrete catchbasin, with 2m^2 of riprap located on the north side of the road at the existing 600mmø CSP culvert crossing.

Township of Wellesley (Deborah-Glaister Line)

- 19m of 525mmø HDPE pipe crossing of Deborah-Glaister Line to replace the existing 600mmø (slightly oversized) CSP culvert by open cut.

- 900x1200mm catchbasin on south side of the road, with 2m^2 of riprap.

Further detail regarding the construction and maintenance of the Drain is in the Special Provisions and Drawings.

11 CONSTRUCTION CONSIDERATIONS

11.1 Construction Scheduling

Construction cannot commence until ten days after a bylaw to adopt this report is given third reading in accordance with the Act.

On this project, it is anticipated that no permits will be required prior to starting construction.

Restricted timing windows for this project, if any, are described in *Section 6 ENVIRONMENTAL CONSIDERATIONS.*

11.2 Design Changes During Construction

In general, design changes requested by landowners, agencies or other authorities after the bylaw is passed cannot be undertaken.

Section 84.1 of the Act and the associated regulation, O. Reg. 500/21, provides criteria and a process for amending this report if design changes are required during construction and approved by the engineer. If design changes are made, this report must be amended after construction with the as-constructed drawings before passing the actual cost bylaw.

Additional work desired by the landowner(s) which is not part of the drainage works may be arranged with the Contractor provided the cost of the work is paid by the landowner(s), and the engineer reviews the additional work in advance. Such additional work is not part of the drainage works for future maintenance.

11.3 Alignment of Drains

All drains shall be constructed and maintained generally to the alignment, as noted on the plans and specified by the Special Provisions. In the absence of survey bars, existing fences and similar boundary features are assumed to represent property lines. 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, landowners may obtain a legal survey at their own cost before construction.

12 DRAWINGS AND SPECIFICATIONS

12.1 Drawings

The location of the drain, watershed boundary and the affected properties are shown on Drawing No. 1 included with this report. The numbers adjacent to the

drain are station numbers which indicate in metres the distance along the drain from the outlet. The profiles, details, sections, and special provisions for the Drain are on Drawings 2 to 7. Construction Specifications – General Notes are included on Drawing 8.

12.2 Specifications

This report incorporates the General Conditions, Standard Specifications and Special Provisions listed in the Table of Contents, which govern the construction and maintenance of the Drain.

13 COST ESTIMATE

The estimated cost of this project includes allowances to owners, the construction cost, the engineering cost and other costs associated with the project.

13.1 Allowances

Sections 29 to 33 of the Drainage Act provides for allowances (compensation) to owners affected by proposed drain construction. On this project, allowances under Section 30 apply and are summarized in *Table 13.1-2 - Summary of Allowances*.

13.1.1 Section 30 - Damages

Section 30 provides for payment of an allowance to landowners along the Drain for damages caused by the construction of the Drain. Where separate access routes to the working area are specified in this report, Section 30 allowances also account for access route damage. No Section 30 allowances are provided to access routes for which a "laneway" is designated as the route. In such cases, the contractor is required to restore the laneway to existing conditions, thereby making a damage allowance irrelevant.

In agricultural areas, crop damages are computed using the methodology outlined in the *Drainage Guide*, published crop values, and declining productivity loss in the years following construction.

For this project, Section 30 allowances are based on the following rates applied to the defined working area:

Table 13.1-1 - Section 30 Allowance Rates

Activity *(*All activities assume agricultural lands)*	Rate
Ditch Cleanout	$3,695/ha *($1,495/acre)*
Tile Drain Construction (including continual construction access along drain)	$2,220/ha *($898/acre)*
Construction Access from Road (not including laneway access)	$3,695/ha *($1,495/acre)*

For the basis of the Section 30 allowance calculations, an average corridor width of 25m is used for the construction of the tile drain. The corridor width is increased to 30m for portions requiring backfill of an existing ditch. Additionally, access paths are identified for each property on Drawing No. 1, anticipated for use by the contractor to access the working area. This rate is applied at a 6m access width.

There is a minimum amount of $100 in damage allowances.

13.1.2 Summary of Allowances

The table below summarizes the corridor widths used to compute the allowances provided under this report:

Table 13.1-2 - Summary of Allowances

Roll No.	Main Drain		Branch 1	Total
	Section 30 (Damages) *Tile Drain*	Section 30 (Damages) *Access*	Section 30 (Damages) *Tile Drain*	($)
007-06400	2,900			2,900
007-06600	3,450			3,450
007-06700	1,700			1,700
007-06800	1,800			1,800
007-06900	2,000	100	100	2,200
007-07100	100			100
007-07200			100	100
TOTAL ALLOWANCES:	11,950	100	200	**12,250**

In accordance with Section 62(3) of the Act, the allowances shown may be deducted from the final assessment levied. Payment to the owner would only be made when the allowance is greater than the final assessment. The allowances are a fixed amount and are not adjusted due to construction.

13.2 Construction Cost Estimate

The estimated cost for Labour, Equipment and Materials to construct the proposed Drain is outlined in detail in Estimated Costs Summary in *Table 13.6-1 - Estimated Cost Summary*. The construction cost estimate is based on recent costs for comparable work. A contingency amount is included to cover additional work that may be required due to field conditions or minor alterations to the project.

The contract for the Drain will be awarded by public tender. If the contract price is more than 33% over the engineer's estimate, Section 59 of the Act requires a Council meeting with the petitioners to determine if the project should proceed.

13.3 Engineering Cost Estimate

Engineering costs include the Engineer's Report, the Council meeting to the consider the report, Court of Revision and Construction Phase Services.

The Engineer's Report includes landowner meetings, survey, agency consultation, and preparation of the report (design, drawings, specifications, cost estimates, and assessments).

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, final cost analysis and preparation of the grant application.

The cost for report preparation is usually not altered at the conclusion of a project unless the report is referred back or the report is appealed to the Drainage Tribunal, which would result in additional costs. The amount shown for meetings (Report Consideration by Council and Court of Revision) is an estimate. The estimate shown for construction phase services assumes standard construction conditions and an efficient Contractor. The final cost for meetings and construction phase services will be based on the actual time spent. Engineering costs are summarized in *Table 13.6-1 - Estimated Cost Summary*

13.4 Estimate of Section 73 Costs

Section 73(2) and 73(3) of the Act direct that the cost of services provided by municipal staff and the Council to carry out the Act process shall not form part of the final cost of the Drain. However, Section 73(1) outlines that the following costs incurred by the Municipality can be included in the cost of the Drain: "*cost of any application, reference or appeal and the cost of temporary financing."*

The estimate of Section 73 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 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 will form part of the final drain cost.

Grant policy indicates that municipal cost for photo-copying and mailing required to carry out the required procedures under the Act can be included in the final drain cost. Section 73 costs are summarized in *Table 13.6-1 - Estimated Cost Summary*.

13.5 Harmonized Sales Tax

The Harmonized Sales Tax (HST) will apply to most costs on this project. The Municipality is eligible for a partial refund on HST paid, the net 1.76% HST (non-recoverable portion) is included in the cost estimates in this report.

13.6 Estimated Cost Summary

Table 13.6-1 - Estimated Cost Summary

DESCRIPTION			TOTAL
ALLOWANCES:			**$12,250**
CONSTRUCTION COST ESTIMATE			
Item	Stations	Description	Cost
i) Main Drain			
M1	-0+057	Construct temporary straw bale check dam.	500
M2	-0+057 to -0+010	47m of ditch bottom cleanout (1.0m bottom width, 1.5:1 side slopes). Level spoil on east side.	700
M3	-0+010 to 0+000	Construct permanent stilling pool (~30m^3 of excavation) with 25m^2 of new riprap on geotextile at outlet.	7,500
M4	0+000 to 0+006	6m of 525mmØ solid plastic pipe at outlet with rodent gate.	2,000
M5	0+006 to 0+484	478m of 525mmØ concrete tile with joint wrap by wheel machine.	43,000
M6	0+000 to 0+484	484m of existing ditch to be backfilled and graded into overflow swale with 2m bottom, ~ 20:1 to 30:1 side slopes.	11,600
M7	~0+095 to ~0+200	Install approx. 75m of new 200mmØ and 36m of 150mmØ perforated plastic tubing header alongside proposed Main Drain, with approximately nine (9) - 100mmØ/150mmØ lateral connections. Also includes connections to the existing header at each end. Tile Plan to be provided. See detail on Dwg. 4. Additional lateral connections beyond quantity est. in this item will be paid as per contingency item for connections.	6,500
M8	0+185 to 1+192	Remove existing 900mmØ concrete culvert and leave for owner. Install twin (2) - 7m long 375mmØ HDPE surface culverts. Restore laneway to existing conditions.	2,500
M9	0+483	Construct new 12m long berm as per detail on Dwg. 4 (~0.15m high at centre). Seed berm.	800
M10	0+484	Construct 900x1200mm concrete DICB, including connections, birdcage grate and marker.	3,500
M11	0+484 to 0+790	306m of 450mmØ concrete tile with joint wrap by wheel machine.	24,500
M12	0+790 to 0+796	Install last 6m of 450mmØ HDPE pipe to 900x1200mm JB under laneway. Also includes remove and disposal of existing 350mmØ concrete tile (and 450mmØ CSP outlet pipe) under laneway. Restore laneway to existing conditions.	2,000
M13	0+784 to 0+798	Remove and dispose of existing 525mmØ CSP surface culvert. Install 12m of new 450mm dia. HDPE surface culvert. Restore laneway to existing conditions.	3,500
M14	0+484 to 0+784	300m of existing ditch to be backfilled and graded into overflow swale with 2m bottom, ~ 20:1 to 30:1 side slopes.	7,200
M15	0+796	Construct 900x1200mm concrete JB, including connections, and concrete lid.	3,000
M16	0+796 to 1+105	309m of 450mmØ concrete tile with joint wrap by wheel machine.	24,700
M17	1+105	Construct 900x1200mm concrete DICB, including connections, birdcage grate and marker.	3,700
M18	1+105 to 1+319	214m of 400mmØ concrete tile with joint wrap by wheel machine.	16,100
M19	1+319	900x1200mm concrete DICB, including connections, birdcage grate and marker.	3,500

		DESCRIPTION	TOTAL
M20	1+319 to 1+751	432m of 350mmØ concrete tile with joint wrap by wheel machine.	28,100
M21	1+751	600x600mm concrete CB, including birdcage grate, connections, marker, and 2m^2 of riprap on geotextile.	2,600
M22	1+751 to 1+768	17m of 300mmØ solid plastic pipe across Lichty Road by open cut. Includes restoration of road with full granular backfill and compaction (see detail on Dwg. 6).	11,000
M23	1+768	600x600mm concrete CB, including birdcage grate, connections, marker, and 2m^2 of riprap on geotextile.	2,600
M24	1+768 to 2+044	276m of 300mmØ concrete tile with joint wrap by wheel machine.	15,200
M25	2+044 to 2+129	85m of 250mmØ concrete tile with joint wrap by wheel machine.	4,300
M26	2+128	Construct new 8m long berm as per detail on Dwg. 6 (~0.4m high at centre). Seed berm.	1,000
M27	2+129	600x600mm concrete CB, including connections, birdcage grate and marker.	2,400
		Sub Total Part i)	**234,000**
ii) Branch 1			
B1	0+000	Supply and install 250x250x200mm plastic tee at junction with Main Dr.	200
B2	0+000 to 0+025	25m of 200mmø solid plastic tubing.	1,100
B3	0+025	Construct 900x1200mm concrete CB, including connections, birdcage grate, marker, and 2m^2 of riprap.	3,500
B4	0+025 to 0+044	Remove and dispose of existing 600mmø CSP surface culvert. Install 19m of 525mm diameter solid plastic pipe across Deborah-Glaister Line by open cut. Includes restoration with backfill and compaction as per standard detail on Dwg. 8 (600mm granular B, 150mm granular A, 60mm HL8 base course, 40mm HL4 surface course). Contractor to dispose of existing asphalt, unless other arrangements made with Twp.	25,000
B5	0+044	Construct 900x1200mm concrete CB, including connections, birdcage grate, marker, and 2m^2 of riprap. Also includes locating ex. 200mmØ plastic header in field. Install 200x200x200mm plastic tee on header and connect to new CB with approx. 6m of 200mmø solid plastic tubing.	3,500
		Sub Total Part i)	**33,300**
iii) Contingencies			
C1		Increased costs to install 250m of tile by backhoe in areas of muck or wet/unstable soils, including geotextile and 300mm of clear crushed stone. (Contingency is intended to be independent of tile size. If required and authorized, would be paid in addition to regular bid item above).	12,500
C2		Increased costs to install 150m of tile by backhoe in stony conditions, where authorized and with thin bedding of clear crushed stone. (Contingency is intended to be independent of tile size. If required and authorized, would be in paid in addition to regular bid item above).	4,500
C3		Contingency allowance for lift-outs of wheel machine to allow for stone removal, including the removal and restarting the wheel machine (based on 5 @ $300/lift-out).	1,500
C4		Tile Connections (based on 15 @ $200/connection).	3,000
C5		Lump sum contingency allowance	5,200
		Sub Total Part iii)	**26,700**
		Sub Total Parts i) to iii):	**294,000**

DESCRIPTION			TOTAL
	Net HST (1.76%)	5,180	
TOTAL CONSTRUCTION COST ESTIMATE:			**$299,180**
ENGINEERING COSTS			
	Report Preparation	56,000	
	Consideration of Report Meeting	1,000	
	Court of Revision	1,000	
	Construction Phase Services	32,000	
	Net HST (1.76%)	1,700	
TOTAL ENGINEERING COSTS:			**$91,700**
TOTAL SECTION 73 COSTS:			**$6,870**
	TOTAL ESTIMATED COST:		**$410,000**

14 ASSESSMENTS

The Drainage Act requires that the total estimated cost 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 Increased Cost (Section 26). On this project assessment for Benefit, Special Benefit, Outlet Liability and Increased Cost (Special) Assessment are involved.

14.1 Calculation of Assessments

Appendix A in this report illustrates how the Drain is divided into sub-sections (intervals) and presents the cost for each interval, as outlined in the *Drainage Guide*. For each interval, the first step in the assessment calculation is to determine the benefit assessment to the affected lands and roads, then special assessments to roads and utilities are determined, where applicable. After deducting the total benefit and special assessments from the interval cost, the balance of the cost is then assessed as outlet liability on a per hectare basis to all lands and roads in the watershed.

14.2 Benefit Assessments (Section 22 and 24)

Benefit assessments are listed in Schedule A – Schedule of Assessments and shown on a per interval basis in Appendix A – Calculation of Assessments.

Section 22 benefits represent the estimated value provided to the property by the works based on the following benefit categories: Direct Outlet (ability of a property to connect directly to the new drain), Improved Drainage (improved drainage along the length of the drain crossing a property), Subsurface Service Area (size of land area that is or could be directly connected via subsurface tile drains) and Cut-off Benefit (when the Drain diverts flow away from an area). *Table 14.2-1 - Section 22 Benefit Assessments* provides a summary of the benefit assessments for the Drain.

Table 14.2-1 - Section 22 Benefit Assessments

Roll No.	Description	MAIN DRAIN	Branch 1	TOTAL
007-06400	-For direct outlet -For improved drainage along drain and land use (new tile) -For sub-surface service area -For connection to private header	1,500 42,600 10,000 5,625		59,725
007-06600	-For direct outlet -For improved drainage along drain -For sub-surface service area -For new culvert	6,000 47,200 18,500 2,625		74,325
007-06700	-For direct outlet -For improved drainage along drain -For area serviced	3,000 18,000 11,200		32,200
007-06800	-For direct outlet -For improved drainage along drain	3,000 17,200		29,700
	-For sub-surface service area	9,500		
007-06900	-For direct outlet -For improved drainage along drain -For sub-surface service area	3,000 15,200 7,100	1,000	26,300
007-07100	-For direct outlet -For sub-surface service area	3,000 4,800		7,800
007-07200	-For direct outlet -For sub-surface service area		3,000 2,200	5,200
008-04200	-For sub-surface service area (future)		600	600
Lichty Road	-For direct outlet	3,000		3,000
Deborah-Glaister Line	-For direct outlet		3,000	3,000
TOTAL BENEFIT		232,050	**9,800**	**241,850**

14.2.1 Importing Fill Material for Proposed Ditch Enclosure

The backfill and re-grading of the existing open ditch has been reviewed in detail and is proposed in a manner to make use of existing material within the 30m Drain right-of-way as shown on the attached drawings, including adjustments made for locations where the open ditch runs along fence lines.

Should the owner desire to further fill the backfilled ditch beyond what is available in the right-of-way, additional fill may be imported either by the contractor (concurrent with the Lebold Drain project) or by the owner privately, following Drain construction. In either case, the engineer will need to review the proposed additional fill grading to ensure a continuous overland flow route exists for surface waters during storm events beyond the capacity of the Lebold Drain tile.

Should additional fill be imported and spread concurrent with the Lebold Drain project, the cost to import the material, as well as the additional grading shall be

assessed to the owner of the property under Section 24 of the Act. The additional costs shall not form the cost of the Drain to be prorated to the watershed.

14.3 Outlet Liability Assessments (Section 23)

Section 23(3) of the Drainage Act states that outlet liability assessment is to be based on the volume and rate of flow of the water artificially caused to flow. Therefore the lands and roads in the watershed are assessed on a per hectare basis, with adjustments made to recognize the different amount of runoff generated by different land uses, as outlined in the *Drainage Guide*. The basis for the adjustments is 1 hectare of cleared agricultural land contributing both surface and subsurface water to the Drain. Land uses with a different runoff rate are adjusted by the factors given in *Table* 14.3-1 - Runoff Factors *Table*.

Table 14.3-1 - Runoff Factors Table

Land Use	Runoff factor
Agricultural	1.0
Forest/swamp	0.5
Lands Tiled In/Away	0.5
Gravel Road	2.0
Paved Road	3.0

14.4 Increased Cost (Special) Assessments (Section 26)

Section 26 of the Drainage Act directs that any increased cost due to a public utility or road authority shall be paid for by that utility or road. This assessment is known as a Special Assessment.

The estimated special assessments are presented in *Table 14.4-1 - Estimated Special Assessments*. The equivalent drain cost is based on the length of Drain affected by the road allowance or utility right of way and the normal cost of drain construction. The increased cost caused by the road or utility is determined by subtracting the equivalent drain cost from the construction and engineering costs.

Table 14.4-1 - Estimated Special Assessments

Drain	Location	Authority/ Owner	Construction Cost	+ Eng. Cost	- Equiv. Drain Cost	+ Net HST	= Est. Special Assess.
Main Drain	1+751 to 1+768	Twp. of Wellesley	13,600 *(Items M21 & M22)*	3,700	-1,105	290	**16,485**
Branch 1	0+025 to 0+044	Twp. of Wellesley	28,500 *(Items B3 & B4)*	5,300	-855	580	**33,525**

Actual special assessments are non-proratable and will be determined after construction by inserting the actual construction and engineering costs in the Special Assessments Table. Any additional costs identified by the engineer will be added to the Special Assessment where appropriate.

The road authority or utility may elect to construct the Drain within their right of way with their forces. In this case, the special assessment is calculated by inserting zero for the construction cost.

If there are increased costs to the drain project due to a utility or road not listed in the table above, a Special Assessment will be based on the actual costs incurred.

14.5 Assessment Schedules

For all assessment schedules, each parcel of land assessed has been identified by the municipal assessment roll number at the time of the preparation of this report. The size of each parcel was established using assessment roll information provided by the Township. If an "F" is shown in the first column, it denotes lands with current Farm Property Tax Class designation that may qualify for Grant. For convenience only, each parcel is also identified by the owner name(s) from the last revised assessment roll.

14.5.1 Schedule A- Schedule of Assessments

The estimated cost for the drainage works in this report is distributed among lands, roads and utilities, as shown in Schedule A, the Schedule of Assessments.

14.5.2 Schedule B -Schedule of Assessments for Maintenance

In accordance with Section 74 of the Act, the Drain shall be maintained by the Municipality, and the cost of maintenance shall be assessed to lands and roads upstream of the maintenance location, pro rata with the amounts in Schedule B. Schedule B $ amounts are listed for calculating share of future maintenance costs. Schedule B $ amounts are not payable at this time.

Schedule B is divided into columns to reflect the different drain intervals so maintenance work can be assessed to upstream lands and roads. The percentages shown in Schedule B determine the share of future maintenance to be levied. For example, a $1,000 ditch cleanout or tile repair will result in a $50 assessment to a property with a 5% maintenance assessment.

14.5.3 Schedule C – Schedule for Actual Cost Bylaw

After the construction of the Drain is certified complete by the Engineer, the Municipality will determine the actual cost of the Drain. Actual assessments will be determined by prorating the actual cost of the Drain using Schedule C. Schedule C illustrates the estimated net assessments after deducting allowances and grants from the total assessments shown in Schedule A. Eligibility for grant will be confirmed by the Municipality at the time the actual cost is levied. Actual assessments in Schedule C will be levied to the owner of the identified parcel at the time the Actual Cost Bylaw is passed.

15 GRANT

In accordance with the provisions of Section 85 of the Act, a grant not exceeding 1/3 (33-1/3%) may be available on the assessments against lands used for

agricultural purposes. The current OMAFRA grant policy defines agricultural lands as privately owned parcels of land which have the Farm Property Class Tax Rate. Based on Municipal assessment roll information, parcels that have the Farm Property Tax Class are identified with an 'F' in the first column of the assessment schedules.

Section 88 of the Act provides for the Municipality to apply for this grant after the construction of the Drain is certified complete by the Engineer. The Municipality must confirm the Farm Property Tax Class on the assessed parcels at the time the grant application is completed and submitted to OMAFRA. OMAFRA has the authority to determine grant eligibility regardless of the designation herein.

If any portion of the drainage works is not eligible for the grant, those ineligible costs are identified in this report.

16 PRIVACY OF LANDS

Although a right of way for the Municipality will exist along the Drain for future maintenance, the land remains private property. Other landowners or the public may not enter or use the drain right of way. Persons authorized to enter the drain right of way to carry out duties under the Act include: Engineers, Contractors and the Drainage Superintendent and/or their assistants.

17 MAINTENANCE

Section 74 of the Act requires the Drain to be maintained by the Municipality, and the cost of maintenance to be assessed to the upstream lands and roads pro rata with the assessments in Schedule B.

17.1 The Drain For Future Maintenance

The Lebold Drain, for the purpose of future maintenance, will include all concrete tile, catchbasins, road crossings, berms, and stilling basins as defined and constructed in accordance with the drawings and special provisions of this report. The Drain is also to include 57m of open ditch downstream of the stilling basin.

After construction, the proposed 525mmø surface water culvert across the Lebold Farms Inc. laneway shall not be a part of the Lebold Drain for future maintenance and shall be maintained by the owner.

17.2 General

All parties affected by the Drain, are encouraged to periodically inspect the Drain and report any visible or suspected problems to the Municipality. Any landowner making a new connection to the Drain shall notify the Drainage Superintendent before making the connection. If the Drainage Superintendent is not notified, the cost to remedy new connections that obstruct or otherwise damage the Drain will be the responsibility of the owner.

A right-of-way along the drain and access routes to the Drain exist for the Municipality to maintain the Drain. The right-of-way for the Drain, as described in the Allowances section of this report shall remain free of obstructions. The cost of removing obstructions is the responsibility of the owner.

The cost of cleaning through road crossings shall be assessed to upstream lands and roads in accordance with Schedule B. The cost for future structural repair/replacement of road crossings shall be assessed fully to the road authority.

17.3 Updating Future Maintenance Schedules

To ensure future maintenance assessments are equitable, the assessments provided in this report should be reapportioned under Section 65 when severances or amalgamations occur when new lands are connected to the Drain or 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.

18 BYLAW

This report including the drawings and specifications, assessment schedules and appendices, when adopted by bylaw in accordance with the Act, provides the basis for construction and maintenance of the Drain.

All of which is respectfully submitted,

K. SMART ASSOCIATES LTD.

Curtis MacIntyre, P. Eng.

SCHEDULE A - SCHEDULE OF ASSESSMENTS
LEBOLD DRAIN
TOWNSHIP OF WELLESLEY

					MAIN DRAIN				BRANCH 1				Gross Total Assessment ($)
Con	Lot	Roll No. (Owner)	Total ha affected	Total ha adjusted	Benefit (Sec. 22)	Special (Sec. 26)	Outlet (Sec. 23)	Total	Benefit (Sec. 22)	Special (Sec. 26)	Outlet (Sec. 23)	Total	
Township of Wellesley (Roll No. 30-24-020-)													
F 3	Pt E½ 4	007-06400 (T. & B. Bauman)	17.2	8.6	59,725	-	3,430	63,155	-	-	-	-	63,155
3	Pt E½ 4	007-06500 (R. & B. Jantzi)	0.2	0.2	-	-	80	80	-	-	-	-	80
F 3	Pt 5	007-06600 (Lebold Farms Inc.)	30.0	27.4	74,325	-	19,044	93,369	-	-	-	-	93,369
3	Pt 5	007-06601 (R. & E. Lebold)	1.1	0.7	-	-	625	625	-	-	-	-	625
F 3	W½ 6	007-06700 (A. Bauman)	14.8	14.8	32,200	-	18,864	51,064	-	-	-	-	51,064
F 3	E½ 6	007-06800 (A. & E. Bauman)	12.7	12.7	29,700	-	16,188	45,888	-	-	-	-	45,888
F 3	Pt W½ 7	007-06900 (C. & D. Erb)	11.1	10.3	25,300	-	15,612	40,912	1,000	-	-	1,000	41,912
F 3	E½ 7	007-07100 (R. & M. Dewar)	6.4	6.4	7,800	-	9,865	17,665	-	-	-	-	17,665
F 2	Pt 7	007-07200 (A. & L. Erb and Kingwood Holsteins Limited)	7.8	6.9	-	-	10,635	10,635	5,200	-	1,311	6,511	17,146
F 2	Pt 8	008-04200 (W. & A. Bauman)	4.2	4.2	-	-	6,474	6,474	600	-	798	1,398	7,872
		Total Assessments on Lands:	105.5	92.2	229,050	-	100,817	329,867	6,800	-	2,109	8,909	338,776
		Deborah Glaister Line (Township of Wellesley)	3.1	9.3	-	-	12,402	12,402	3,000	33,525	456	36,981	49,383
		Lichty Road (Township of Wellesley)	0.9	1.8	3,000	16,485	2,356	21,841	-	-	-	-	21,841
		Total Assessments on Lands:	4.0	11.1	3,000	16,485	14,758	34,243	3,000	33,525	456	36,981	71,224
TOTAL ASSESSMENT LEBOLD DRAIN:			**109.5**	**103.3**	**232,050**	**16,485**	**115,575**	**364,110**	**9,800**	**33,525**	**2,565**	**45,890**	**410,000**

Notes:

1. Lands noted with an "F" are classified as agricultural and according to current OMAFRA policy qualify for the 1/3 grant
   Eligibility for the 1/3 grant will be confirmed at the time the actual 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 the owner's names as shown by the last revised assessment roll have also been included.

SCHEDULE B - SCHEDULE OF ASSESSMENTS FOR FUTURE MAINTENANCE
LEBOLD DRAIN
TOWNSHIP OF WELLESLEY

			Interval 1 -0+057 to 0+484		Interval 2 0+484 to 0+796		Interval 3 0+796 to 1+105		Interval 4 1+105 to 1+751		Interval 5 1+751 to 1+768		Interval 6 1+751 to 2+129		MAIN DRAIN			Branch 1 0+000 to 0+044	
Con	Lot	Roll No. (Owner)	$	%	$	%	$	%	$	%	$	%	$	%	$	%		$	%
Township of Wellesley (Roll No. 30-24-020-)																			
3	Pt E½ 4	007-06400 (T. & B. Bauman)	*28,293*	36.11	*0*	0.00	*0*	0.00	*0*	0.00	*0*	0.00	*0*	0.00	*28,293*	12.16		*0*	0.00
3	Pt E½ 4	007-06500 (R. & B. Jantzi)	*80*	0.10	*0*	0.00	*0*	0.00	*0*	0.00	*0*	0.00	*0*	0.00	*80*	0.03		*0*	0.00
3	Pt 5	007-06600 (Lebold Farms Inc.)	*19,227*	24.54	*16,935*	39.02	*12,545*	37.54	*0*	0.00	*0*	0.00	*0*	0.00	*48,707*	20.94		*0*	0.00
3	Pt 5	007-06601 (R. & E. Lebold)	*279*	0.36	*187*	0.43	*159*	0.48	*0*	0.00	*0*	0.00	*0*	0.00	*625*	0.27		*0*	0.00
3	W½ 6	007-06700 (A. Bauman)	*7,902*	10.08	*6,462*	14.89	*6,007*	17.98	*16,093*	31.53	*0*	0.00	*0*	0.00	*36,464*	15.68		*0*	0.00
3	E½ 6	007-06800 (A. & E. Bauman)	*7,065*	9.02	*5,900*	13.60	*5,881*	17.60	*16,692*	32.70	*0*	0.00	*0*	0.00	*35,538*	15.28		*0*	0.00
3	Pt W½ 7	007-06900 (C. & D. Erb)	*4,108*	5.24	*3,757*	8.66	*2,336*	6.99	*5,927*	11.61	*1,801*	32.45	*8,335*	40.00	*26,264*	11.29		*747*	10.00
3	E½ 7	007-07100 (R. & M. Dewar)	*2,552*	3.26	*2,713*	6.25	*1,452*	4.35	*3,440*	6.74	*748*	13.48	*5,209*	25.00	*16,114*	6.93		*0*	0.00
2	Pt 7	007-07200 (A. & L. Erb and Kingwood Holsteins Limited)	*2,752*	3.51	*2,847*	6.56	*1,565*	4.68	*3,631*	7.11	*786*	14.16	*4,167*	20.00	*15,748*	6.77		*3,734*	50.00
2	Pt 8	008-04200 (W. & A. Bauman)	*1,675*	2.14	*1,624*	3.74	*953*	2.85	*1,601*	3.14	*327*	5.89	*1,875*	9.00	*8,055*	3.46		*1,120*	15.00
		Total Assessments on Lands:	*73,933*	94.36	*40,425*	93.15	*30,898*	92.47	*47,384*	92.83	*3,662*	65.98	*19,586*	94.00	*215,887*	92.81		*5,601*	75.00
		Deborah Glaister Line (Township of Wellesley)	*3,708*	4.73	*2,490*	5.74	*2,109*	6.31	*2,974*	5.83	*327*	5.89	*1,250*	6.00	*12,858*	5.53		*1,867*	25.00
		Lichty Road (Township of Wellesley)	*716*	0.91	*483*	1.11	*409*	1.22	*686*	1.34	*1,561*	28.13	*0*	0.00	*3,855*	1.66		*0*	0.00
		Total Assessments on Lands:	*4,424*	5.64	*2,973*	6.85	*2,518*	7.53	*3,660*	7.17	*1,888*	34.02	*1,250*	6.00	*16,713*	7.19		*1,867*	25.00
TOTAL ASSESSMENTS			*78,357*	100.00	*43,398*	100.00	*33,416*	100.00	*51,044*	100.00	*5,550*	100.00	*20,836*	100.00	*232,600*	100.00		*7,468*	100.00

Notes:
1. Agricultural designation not included as grant eligibility has to be confirmed at the time of maintenance cost levy.
2. $ amounts above are listed solely for calculating percentages (share of future maintenance costs) and will not be levied with the final cost of the drainage works.

SCHEDULE C - SCHEDULE FOR ACTUAL COST BYLAW
LEBOLD DRAIN
TOWNSHIP OF WELLESLEY

	Con	Lot	Roll No. (Owner)	Ha. Affected	Estimated Gross Assessment	Actual Gross Assessment [2]		1/3 Grant	Allowances		Estimated NET Assessment	Actual NET Assessment [3]
	Township of Wellesley (Roll No. 30-24-020-)											
F	3	Pt E½ 4	007-06400 (T. & B. Bauman)	17.2	63,155			21,052	2,900		39,203	
	3	Pt E½ 4	007-06500 (R. & B. Jantzi)	0.2	80			0			80	
F	3	Pt 5	007-06600 (Lebold Farms Inc.)	30.0	93,369			31,123	3,450		58,796	
	3	Pt 5	007-06601 (R. & E. Lebold)	1.1	625			0			625	
F	3	W½ 6	007-06700 (A. Bauman)	14.8	51,064			17,021	1,700		32,343	
F	3	E½ 6	007-06800 (A. & E. Bauman)	12.7	45,888			15,296	1,800		28,792	
F	3	Pt W½ 7	007-06900 (C. & D. Erb)	11.1	41,912			13,971	2,200		25,741	
F	3	E½ 7	007-07100 (R. & M. Dewar)	6.4	17,665			5,888	100		11,677	
F	2	Pt 7	007-07200 (A. & L. Erb and Kingwood Holsteins Limited)	7.8	17,146			5,715	100		11,331	
F	2	Pt 8	008-04200 (W. & A. Bauman)	4.2	7,872			2,624			5,248	
			Total Assessments on Lands:	105.5	338,776			112,690	12,250		213,836	
			Deborah Glaister Line (Township of Wellesley)	3.1	49,383			0			49,383	
			Lichty Road (Township of Wellesley)	0.9	21,841			0			21,841	
			Total Assessments on Roads:	4.0	71,224			0	0		71,224	
	TOTAL ASSESSMENT LEBOLD DRAIN:			109.5	410,000			112,690	12,250		**285,060**	

Notes:

1. Lands noted with an "F" are classified as agricultural and according to current OMAFRA policy qualify for the 1/3 grant Eligibility for the 1/3 grant will be confirmed at the time the actual cost is levied.
2. Actual Gross Assessment is determined based on the final actual costs, following construction.
3. Actual Net Assessment will be the amount levied to the owner of the parcel at the end of the project. (Net Assessments subtract Allowances and an anticipated 1/3 Grant from the Gross Assessment)

				MAIN DRAIN																					
				Interval 1					Interval 2					Interval 3					Interval 4					Interval 5			
				Station -0+057 to 0+484					Station 0+484 to 0+796					Station 0+796 to 1+105					Station 1+105 to 1+751					Station 1+751 to 1+768			
ESTIMATED COST	Allowances			2,900					1,750					1,700					3,500					0			
	Construction			82,600					44,800					34,500					52,500					17,800			
	Engineering			17,000					9,500					7,500					11,000					4,000			
	Construction Supervision			9,200					5,000					3,800					5,800					2,400			
	Administration			1,870					1,100					800					1,300					400			
	Net HST			1,950					1,060					815					1,245					435			
	TOTAL			115,520					63,210					49,115					75,345					25,035			
Roll No. (Owner)	Total Ha Affected	Run-off Factor	Total ha Adjusted	Benefit (Sec. 22)	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total	Benefit (Sec. 22)	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total	Benefit (Sec. 22)	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total	Benefit (Sec. 22)	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total	Benefit (Sec. 22)	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total
Township of Wellesley (Roll No. 30-24-020-)																												
007-06400 (T. & B. Bauman)	17.2	0.5	8.6	59,725		8.6	3,430	63,155			0.0	0	0			0.0	0	0			0.0	0	0			0.0	0	0
007-06500 (R. & B. Jantzi)	0.2	1.0	0.2			0.2	80	80			0.0	0	0			0.0	0	0			0.0	0	0			0.0	0	0
007-06600 (Lebold Farms Inc.)	30.0	0.9	27.4	14,600		27.4	10,927	25,527	39,625		21.0	5,622	45,247	20,100		11.0	2,495	22,595			0.0	0	0			0.0	0	0
007-06601 (R. & E. Lebold)	1.1	0.6	0.7			0.7	279	279			0.7	187	187			0.7	159	159			0.0	0	0			0.0	0	0
007-06700 (A. Bauman)	14.8	1.0	14.8			14.8	5,902	5,902			14.8	3,962	3,962	11,300		14.8	3,357	14,657	20,900		14.8	5,643	26,543			0.0	0	0
007-06800 (A. & E. Bauman)	12.7	1.0	12.7			12.7	5,065	5,065			12.7	3,400	3,400			12.7	2,881	2,881	29,700		12.7	4,842	34,542			0.0	0	0
007-06900 (C. & D. Erb)	11.1	0.9	10.3			10.3	4,108	4,108			10.3	2,757	2,757			10.3	2,336	2,336			10.3	3,927	3,927	3,000		10.3	801	3,801
007-07100 (R. & M. Dewar)	6.4	1.0	6.4			6.4	2,552	2,552			6.4	1,713	1,713			6.4	1,452	1,452			6.4	2,440	2,440			6.4	498	498
007-07200 (A. & L. Erb and Kingwood Holsteins Limited)	7.8	0.9	6.9			6.9	2,752	2,752			6.9	1,847	1,847			6.9	1,565	1,565			6.9	2,631	2,631			6.9	536	536
008-04200 (W. & A. Bauman)	4.2	1.0	4.2			4.2	1,675	1,675			4.2	1,124	1,124			4.2	953	953			4.2	1,601	1,601			4.2	327	327
Subtotal (Lands):	105.5	8.9	92.2	74,325	0	92.2	36,770	111,095	39,625	0	77.0	20,612	60,237	31,400	0	67.0	15,198	46,598	50,600	0	55.3	21,084	71,684	3,000	0	27.8	2,162	5,162
Deborah Glaister Line (Township of Wellesley)	3.1	3.0	9.3			9.3	3,708	3,708			9.3	2,490	2,490			9.3	2,109	2,109			7.8	2,974	2,974			4.2	327	327
Lichty Road (Township of Wellesley)	0.9	2.0	1.8			1.8	717	717			1.8	483	483			1.8	408	408			1.8	687	687	3,000	16,485	0.8	61	19,546
Subtotal (Roads):	4.0	5.0	11.1	0	0	11.1	4,425	4,425	0	0	11.1	2,973	2,973	0	0	11.1	2,517	2,517	0	0	9.6	3,661	3,661	3,000	16,485	5.0	388	19,873
TOTAL ASSESSMENT LEBOLD DRAIN:	**109.5**	**13.9**	**103.3**	**74,325**	**0**	**103.3**	**41,195**	**115,520**	**39,625**	**0**	**88.1**	**23,585**	**63,210**	**31,400**	**0**	**78.1**	**17,715**	**49,115**	**50,600**	**0**	**64.9**	**24,745**	**75,345**	**6,000**	**16,485**	**32.8**	**2,550**	**25,035**

				MAIN DRAIN Cont'd'									BRANCH 1					GRAND			
				Interval 6					MAIN DRAIN												
				Station	1+768	to	2+129		TOTAL				Station	0+000	to	0+044		TOTAL			
	Allowances					2,200			12,050						200			12,250			
	Construction					25,200			257,400						36,600			294,000			
	Engineering					5,000			54,000						4,000			58,000			
ESTIMATED COST	Construction Supervision					2,300			28,500						3,500			32,000			
	Administration					600			6,070						800			6,870			
	Net HST					585			6,090						790			6,880			
	TOTAL					35,885			364,110						45,890			410,000			
Roll No. (Owner)	Total Ha Affected	Run-off Factor	Total ha Adjusted	Benefit (Sec. 22)	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total	Total Benefits	Total Special	Total Outlets	TOTAL	Benefit (Sec. 22)	Special (Sec. 26)	Adj Ha	Outlet (Sec. 23)	Total	Total Benefits	Total Special	Total Outlets	TOTAL
Township of Wellesley (Roll No. 30-24-020-)																					
007-06400 (T. & B. Bauman)	17.2	0.5	8.6			0.0	0	0	59,725	0	3,430	63,155			0.0	0	0	59,725	0	3,430	63,155
007-06500 (R. & B. Jantzi)	0.2	1.0	0.2			0.0	0	0	0	0	80	80			0.0	0	0	0	0	80	80
007-06600 (Lebold Farms Inc.)	30.0	0.9	27.4			0.0	0	0	74,325	0	19,044	93,369			0.0	0	0	74,325	0	19,044	93,369
007-06601 (R. & E. Lebold)	1.1	0.6	0.7			0.0	0	0	0	0	625	625			0.0	0	0	0	0	625	625
007-06700 (A. Bauman)	14.8	1.0	14.8			0.0	0	0	32,200	0	18,864	51,064			0.0	0	0	32,200	0	18,864	51,064
007-06800 (A. & E. Bauman)	12.7	1.0	12.7			0.0	0	0	29,700	0	16,188	45,888			0.0	0	0	29,700	0	16,188	45,888
007-06900 (C. & D. Erb)	11.1	0.9	10.3	22,300		8.9	1,683	23,983	25,300	0	15,612	40,912	1,000		0.0	0	1,000	26,300	0	15,612	41,912
007-07100 (R. & M. Dewar)	6.4	1.0	6.4	7,800		6.4	1,210	9,010	7,800	0	9,865	17,665			0.0	0	0	7,800	0	9,865	17,665
007-07200 (A. & L. Erb and Kingwood Holsteins Limited)	7.8	0.9	6.9			6.9	1,304	1,304	0	0	10,635	10,635	5,200		6.9	1,311	6,511	5,200	0	11,946	17,146
008-04200 (W. & A. Bauman)	4.2	1.0	4.2			4.2	794	794	0	0	6,474	6,474	600		4.2	798	1,398	600	0	7,272	7,872
Subtotal (Lands):	105.5	8.9	92.2	30,100	0	26.4	4,991	35,091	229,050	0	100,817	329,867	6,800	0	11.1	2,109	8,909	235,850	0	102,926	338,776
Deborah Glaister Line (Township of Wellesley)	3.1	3.0	9.3			4.2	794	794	0	0	12,402	12,402	3,000	33,525	2.4	456	36,981	3,000	33,525	12,858	49,383
Lichty Road (Township of Wellesley)	0.9	2.0	1.8			0.0	0	0	3,000	16,485	2,356	21,841			0.0	0	0	3,000	16,485	2,356	21,841
Subtotal (Roads):	4.0	5.0	11.1	0	0	4.2	794	794	3,000	16,485	14,758	34,243	3,000	33,525	2.4	456	36,981	6,000	50,010	15,214	71,224
TOTAL ASSESSMENT LEBOLD DRAIN:	**109.5**	**13.9**	**103.3**	**30,100**	**0**	**30.6**	**5,785**	**35,885**	**232,050**	**16,485**	**115,575**	**364,110**	**9,800**	**33,525**	**13.5**	**2,565**	**45,890**	**241,850**	**50,010**	**118,140**	**410,000**

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 200mm 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 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

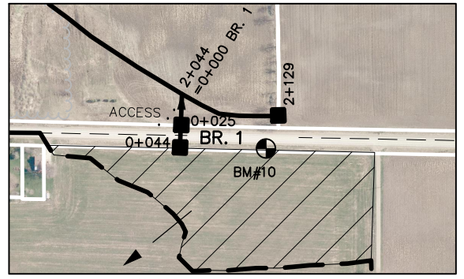
All tile or pipe connected to concrete catchbasins shall be mortared or secured in place so that no gaps remain at the connection. Mortar is to be applied on both the inside and outside wall surfaces.

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.



PLAN ENLARGEMENT
SCALE 1:5,000

BENCHMARKS

BM#1
SPIKE IN NORTHEAST FACE CORNER FENCE POST 10m SOUTH OF DITCH CROSSING FENCE
ELEV. 374.345

BM#2
SPIKE IN N/FACE FENCE POST ALONG EAST FENCELINE 7m NORTH OF CORNER FENCEPOST, 23m EAST DOWNSTREAM END OF 900mmø CONCRETE CULVERT
ELEV. 376.733

BM#3
SPIKE IN SOUTHEAST FACE CORNER OF FENCE POST 12m WEST OF BEND OF DITCH
ELEV. 378.664

BM#4
FND NAIL IN S/SIDE LONE FENCE POST ON BAUMAN/LEBOLD P/L ON SOUTH BANK
ELEV. 378.801

BM#5
FND NAIL IN NORTHEAST H.P. 28m SOUTH OF CULVERT CROSSING LEBOLD LANEWAY
ELEV. 380.280

BM#6
FND NAIL IN SOUTHWEST SIDE CORNER FENCE POST 15m NORTH OF DICB ALONG L/F
ELEV. 381.995

BM#7
NEW SPIKE IN S/SIDE CORNER FENCE POST ENTRANCE TO BAUMAN FARM OFF LICHTY ROAD
ELEV. 384.059

BM#9
FND 2 NAILS IN W/FACE H.P. E/SIDE LICHTY ROAD 10m SOUTH OF ROAD CULVERT
ELEV. 385.425

BM#10
SPIKE IN N/FACE H.P. S/SIDE DEBORAH GLAISTER LINE AT TOP END OF DRAIN
ELEV. 388.717

HORIZONTAL DATUM: WORLD WIDE/UTM 17 NORTH NAD 1983 (CANADA)
VERTICAL DATUM: CGVD 28:78
PROJECTION: GRID (SCALE FACTOR = 1)

ALL ROLL NUMBERS BEGIN WITH 30–24–020–
i.e. 007–06600 IN FULL IS 30–24–020–007–06600

No.	DESCRIPTION	DATE
1	ISSUED FOR GRCA REVIEW	APR. 15, 2024
2	ISSUED FOR REPORT	MAY 30, 2024
3	ISSUED FOR TENDER	
4	ISSUED FOR CONSTRUCTION	
5	AS–BUILT	

DESIGNED BY: C.J.M.
CHECKED BY: J.W.K.
DRAWN BY: M.C.J.
CHECKED BY: C.J.M.

LICENSED PROFESSIONAL ENGINEER
C. J. MACINTYRE
100507574
MAY 30, 2024
PROVINCE OF ONTARIO

SCALE
0 100 200m
SCALE 1:10,000
(ON 11x17)

LEBOLD DRAIN

REGION OF WATERLOO — TOWNSHIP OF WELLESLEY

WATERSHED PLAN

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 INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

PLAN LEGEND

- — MAJOR WATERSHED
- — INTERMEDIATE WATERSHED
- — PROPOSED WORK OR INCORPORATION
- ACCESS — ACCESS
- — DITCH OR WATERCOURSE
- (2.8) — APPROXIMATE HECTARES IN WATERSHED
- 5.2 ha. — HECTARES OWNED
- (007–06600) — ASSESSMENT ROLL NUMBER
- DENOTES AREA TILED OUT OF WATERSHED (ASSESSED AT ½ RATE)
- — BUSH AREA

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

MAY 30, 2024
JOB NUMBER: 06–146
DRAWING 1 OF 8

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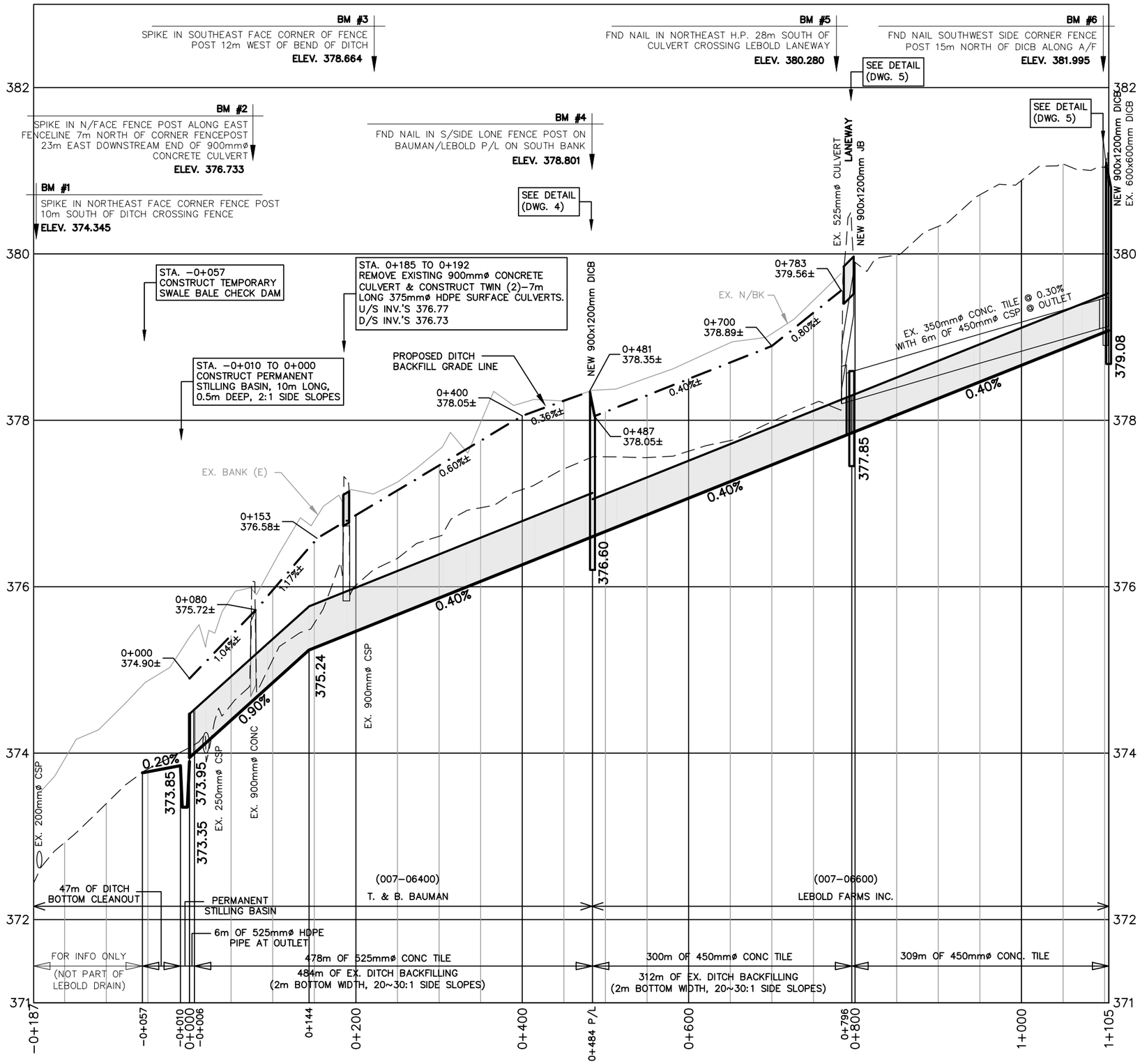

SPECIAL PROVISIONS – CONSTRUCTION NOTES:

300.2) CONSTRUCTION SPECIFICATIONS – SPECIFIC NOTES

T. & B. BAUMAN (007–06400)

−0+057 TO −0+010	−47m OF DITCH BOTTOM CLEANOUT (2m BOTTOM WIDTH, 2:1 SIDE SLOPES) −LEVEL EXCAVATED MATERIALS ON WEST BANK −SEED BANKS OF DITCH.
−0+010 TO 0+006	−SEE NOTES ON DWG. 4
0+006 TO 0+484	−478m OF 525mmø CONCRETE TILE WITH JOINT WRAP TO BE INSTALLED ON EAST/NORTH SIDE OF EXISTING DITCH.
0+000 TO 0+484	−BACKFILL EXISTING DITCH BY KNOCKING IN BANKS AND GRADING OUT INTO FIELD IN BOTH DIRECTIONS. −PRIOR TO BACKFILLING, STRIP TOPSOIL FROM DITCH BANKS AND FIELD FOR PROPOSED GRADING LIMITS. −SPREAD EXISTING TOPSOIL OVER FILLED DITCH AND GRADE SWALE TO APPROXIMATE GRADE LINE ON PROFILE (5m BOTTOM WIDTH, 20 ~ 30:1 SIDE SLOPES) −SEE ADDITIONAL NOTES AND SECTIONS FOR DITCH BACKFILL ON DWG. 7
0+484	−SEE NOTES ON DWG. 4

LEBOLD FARMS INC (007–06600)

0+484 TO 0+796	−312m OF 450mmø CONCRETE TILE WITH JOINT WRAP TO BE INSTALLED ON NORTH SIDE OF EXISTING DITCH.
0+484 TO 0+784	−BACKFILL EXISTING DITCH BY KNOCKING IN BANKS AND GRADING OUT INTO FIELD IN BOTH DIRECTIONS. −PRIOR TO BACKFILLING, STRIP TOPSOIL FROM DITCH, BANKS AND FIELD FOR PROPOSED GRADING LIMITS. −SPREAD EXISTING TOPSOIL OVER FILLED DITCH AND GRADE SWALE TO APPROXIMATE GRADE LINE ON PROFILE (2m BOTTOM WIDTH, 20 ~ 30:1 SIDE SLOPES) −SEE ADDITIONAL NOTES AND SECTIONS FOR DITCH BACKFILL ON DWG. 7
0+796	−SEE NOTES ON DWG. 5
0+796 TO 1+105	−309m OF 450mmø CONCRETE TILE WITH JOINT WRAP TO BE INSTALLED ON NORTH SIDE OF EXISTING 350mmø CONCRETE TILE.

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DESIGNED BY: C.J.M.
CHECKED BY: J.W.K.
DRAWN BY: M.C.J.
CHECKED BY: C.J.M.

LICENSED PROFESSIONAL ENGINEER
C. J. MACINTYRE
100507574
MAY 30, 2024
PROVINCE OF ONTARIO

SCALE
0 50 100m
(SCALE 1 : 5000)
HORZ.
0 1m
(SCALE 1 : 50)
VERT.
(ON 11"x 17")

LEBOLD DRAIN

REGION OF WATERLOO — TOWNSHIP OF WELLESLEY

PROFILE (1)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

MAY 30, 2024
JOB NUMBER: 06–146
DRAWING 2 OF 8

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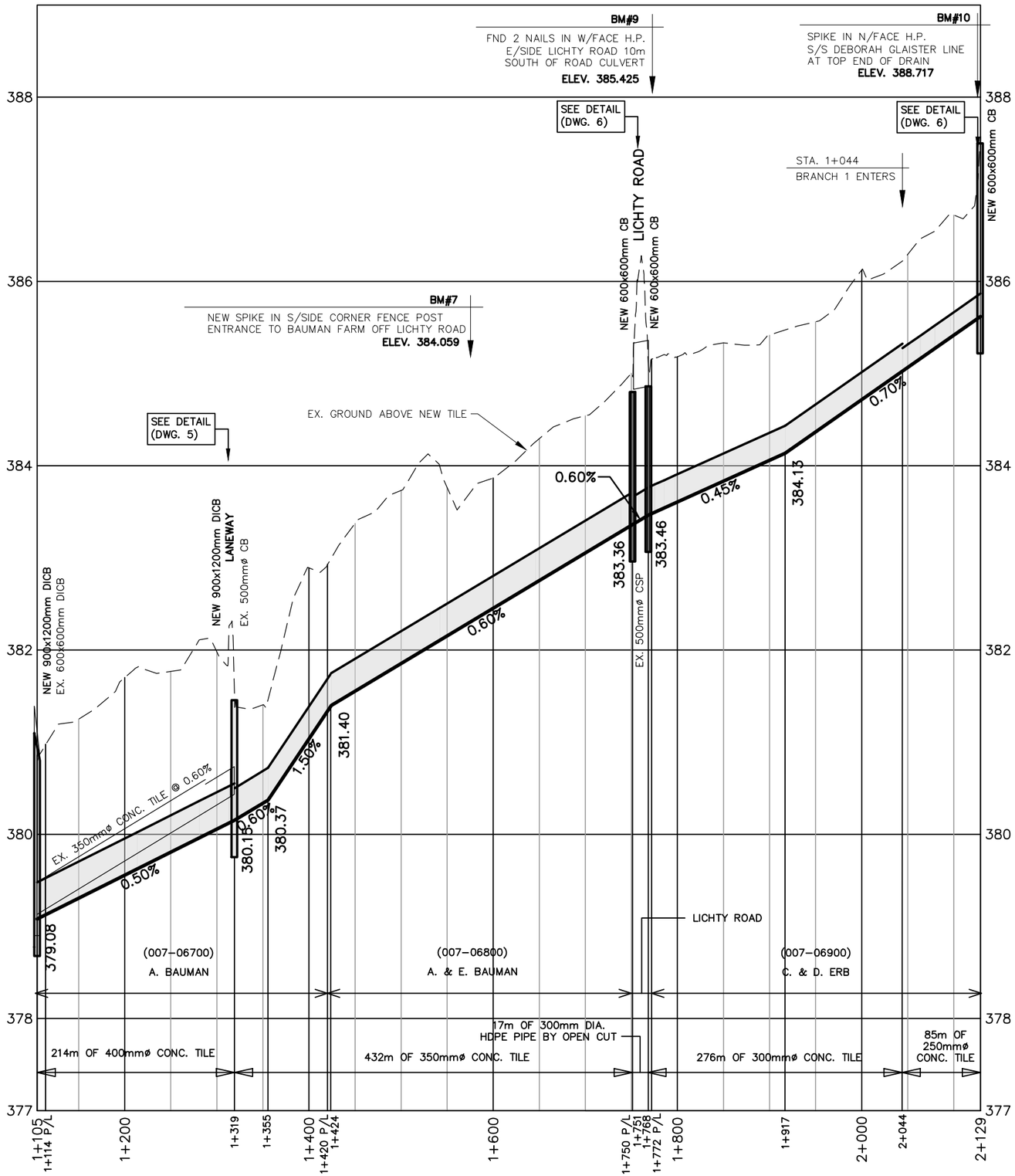

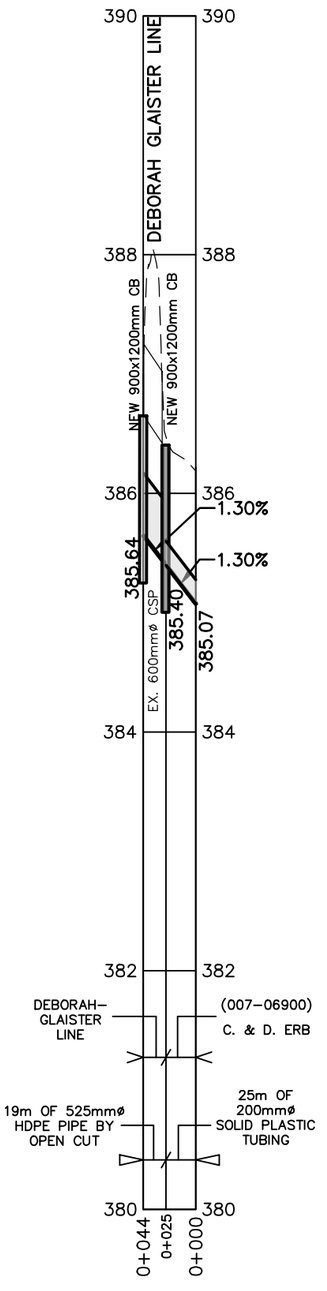

BRANCH 1

SPECIAL PROVISIONS – CONSTRUCTION NOTES:

300.2) CONSTRUCTION SPECIFICATIONS – SPECIFIC NOTES

A. BAUMAN (007-06700)

1+105	–SEE NOTES ON DWG. 5
1+105 TO 1+319	–214m OF 400mmø CONCRETE TILE WITH JOINT WRAP BETWEEN EX. 350mmø CONC. TILE AND SYSTEMATIC DRAINAGE TO SOUTH.
1+319	–SEE NOTES ON DWG. 5
1+319 TO 1+751	–432m OF 350mmø CONCRETE TILE WITH JOINT WRAP
1+590 TO 1+751	–PROPOSED ALIGNMENT TO SPLIT EXISTING PRIVATE DRAINAGE LATERALS. CONTRACTOR MAY BE ASKED TO LOCATE EXISTING 4" PLASTIC LATERAL IN 2–3 LOCATIONS FROM 1+590 TO LICHTY ROAD TO AVOID HITTING PRIVATE LATERALS.

TOWNSHIP OF WELLESLEY (LICHTY ROAD)

1+751 TO 1+768	–SEE NOTES ON DWG. 6

C. & D. ERB (007-06900)

1+768 TO 2+080	–282m OF 300mmø CONCRETE TILE WITH JOINT WRAP –FROM 1+768 TO APPROX. 1+900 : PROPOSED ALIGNMENT IS ALONG EDGE OF FIELD WITH AVERAGE DISTANCE OF 4–8m OFFSET OF GRCA DESIGNATED. AT TIME OF CONSTRUCTION, ENGINEER WILL LAYOUT ALIGNMENT TO ENSURE CONSTRUCTION FOLLOWS PROPOSED DESIGN.
2+050 TO 2+129	–79m OF 250mmø CONCRETE TILE WITH JOINT WRAP.

BRANCH 1

C. & D. ERB (007-06900)

0+000 TO 0+025	–25m OF 200mmø SOLID PLASTIC TUBING. CONNECT 200mmø TUBING TO NEW 250mmø CONC. TILE WITH USE OF 250x250x200mm PLASTIC TEE. –SEE STANDARD SPECIFICATION 420.3.5.2 "INSTALLATION OF CORRUGATED PLASTIC TUBING". IF INSTALLED BY EXCAVATOR/BACKHOE, CONTRACTOR TO BED PLASTIC TUBING WITH ¾" CLEAR STONE UP TO SPRINGLINE.

TOWNSHIP OF WELLESLEY (DEBORAH-GLASITER LINE)

0+025 TO 0+044	–SEE NOTES ON DWG. 6

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CHECKED BY: J.W.K.
DRAWN BY: M.C.J.
CHECKED BY: C.J.M.

LICENSED PROFESSIONAL ENGINEER
C. J. MACINTYRE
100507574
MAY 30, 2024
PROVINCE OF ONTARIO

SCALE
0 50 100m
(SCALE HORZ. 1 : 5000)
0 1m
(SCALE VERT. 1 : 50)
(ON 11"x 17")

LEBOLD DRAIN

REGION OF WATERLOO — TOWNSHIP OF WELLESLEY

PROFILE CONTINUED

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

MAY 30, 2024
JOB NUMBER: 06-146
DRAWING 3 OF 8

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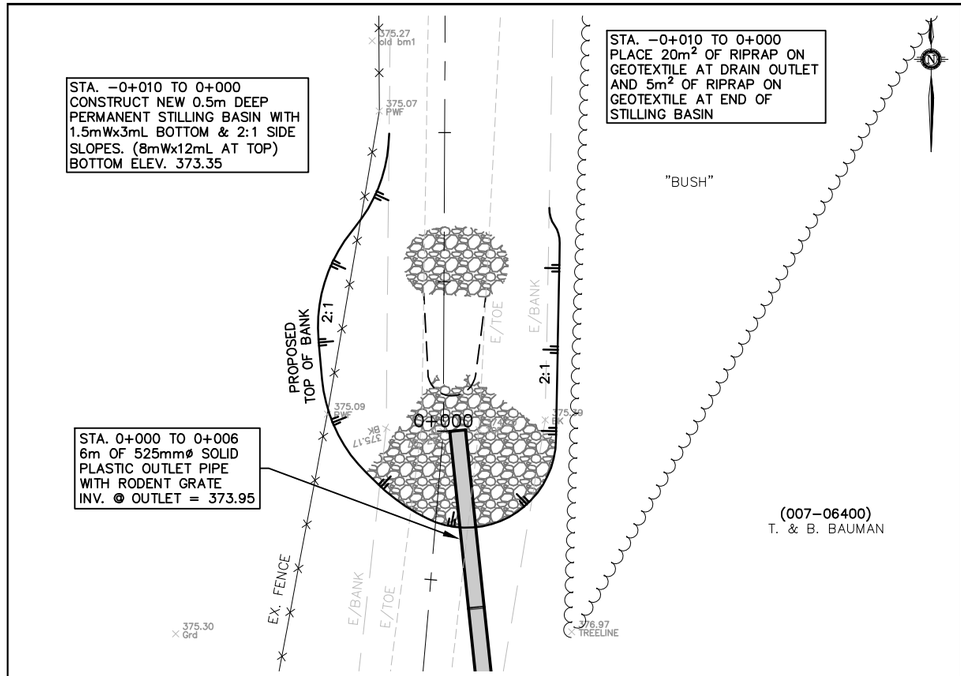
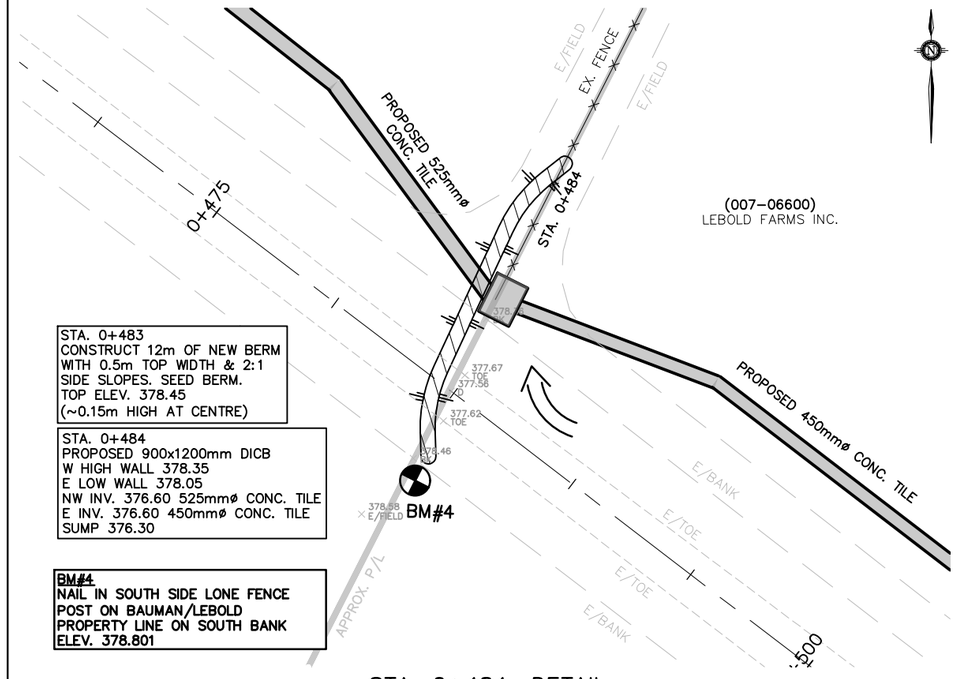


STA. 0+000: DETAIL

0 2 4m

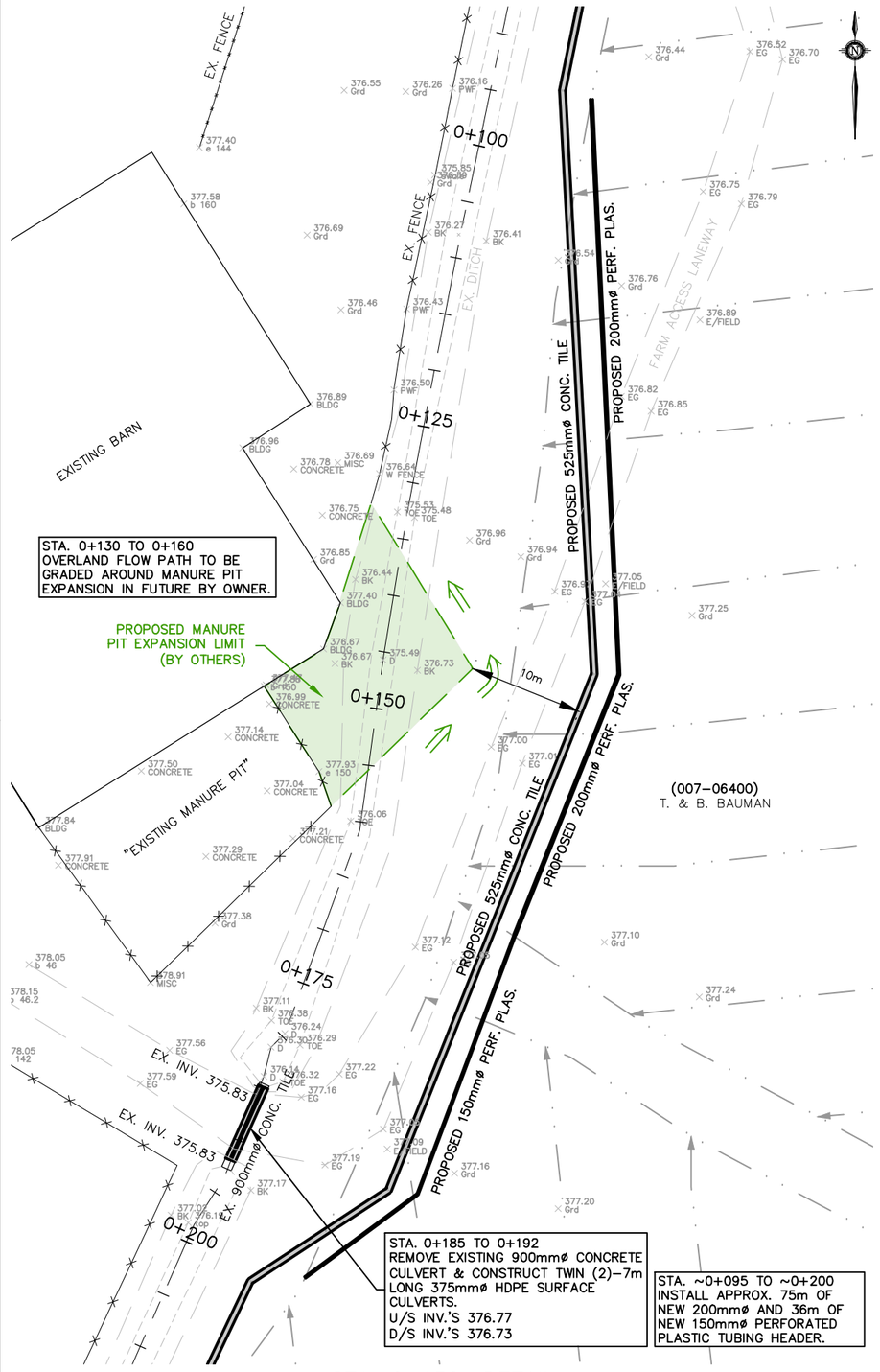
SCALE 1:200



STA. 0+484: DETAIL

0 2 4m

SCALE 1:200



STA. 0+150: DETAIL

0 5 10m

SCALE 1:500

SPECIAL PROVISIONS – CONSTRUCTION NOTES:

300.2) CONSTRUCTION SPECIFICATIONS – SPECIFIC NOTES

T. & B. BAUMAN (007−06400)

−0+010 TO 0+010	−CONSTRUCT PERMANENT STILLING BASIN, 10m LONG, 1m BOTTOM WIDTH, 2:1 SIDE SLOPES. BOTTOM ELEV. 373.35 −PLACE 10m² OF RIPRAP ON GEOTEXTILE AT DRAIN OUTLET AND 5m² OF RIPRAP ON GEOTEXTILE AT END OF STILLING BASIN. −SEED DISTURBED BANKS.
0+000 TO 0+006	−6m OF 525mmø HDPE PIPE AT OUTLET WITH RODENT GATE
0+006 TO 0+484	−SEE NOTES ON DWG. 2
0+075	−REMOVE EXISTING 900mmø CONCRETE CULVERT AND LEAVE FOR OWNER.
0+095 TO 0+200	−INSTALL APPROX. 75m OF NEW 200mmø AND 36m OF NEW 150mmø PERF. PLASTIC TUBING HEADER ALONG EAST SIDE OF NEW LEBOLD DRAIN (111m PLASTIC TUBING TOTAL). INCLUDES APPROX. NINE (9) 100mmø AND 150mmø LATERAL CONNECTIONS. ALSO INCLUDES CONNECTION TO EXISTING HEADER. −SEE STANDARD SPECIFICATION 420.3.5.2 "INSTALLATION OF CORRUGATED PLASTIC TUBING". IF INSTALLED BY EXCAVATOR/BACKHOE, CONTRACTOR TO BED PLASTIC TUBING WITH ¾" CLEAR STONE UP TO SPRINGLINE.
0+185 TO 0+192	−REMOVE EXISTING 900mmø CONC. CULVERT AND LEAVE FOR OWNER. INSTALL TWIN (2) – 7m LENGTH OF NEW 375mmø HDPE. FOR BEDDING/BACKFILL OF PIPES, REFER TO "TYPICAL LANEWAY CULVERT" ON DWG. 5. RESTORE LANEWAY TO EXISTING CONDITIONS.
0+483	−CONSTRUCT 10m OF NEW BERM AS PER DETAIL. USE SUITABLE MATERIAL LOCATED OUTSIDE EDGE OF FIELD, DIRECTLY UPSTREAM OF PROPOSED BERM.
0+484	−INSTALL 900x1200mm CONCRETE DITCH INLET CATCHBASIN, INCLUDING CONNECTIONS, BIRDCAGE GRATE, AND MARKER.

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5	AS−BUILT	

DESIGNED BY: C.J.M.
CHECKED BY: J.W.K.
DRAWN BY: M.C.J.
CHECKED BY: C.J.M.

LICENSED PROFESSIONAL ENGINEER
C. J. MACINTYRE
100507574
MAY 30, 2024
PROVINCE OF ONTARIO

SCALE
AS SHOWN

LEBOLD DRAIN

REGION OF WATERLOO — TOWNSHIP OF WELLESLEY

DETAILS (1)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

MAY 30, 2024
JOB NUMBER: 06−146
DRAWING 4 OF 8

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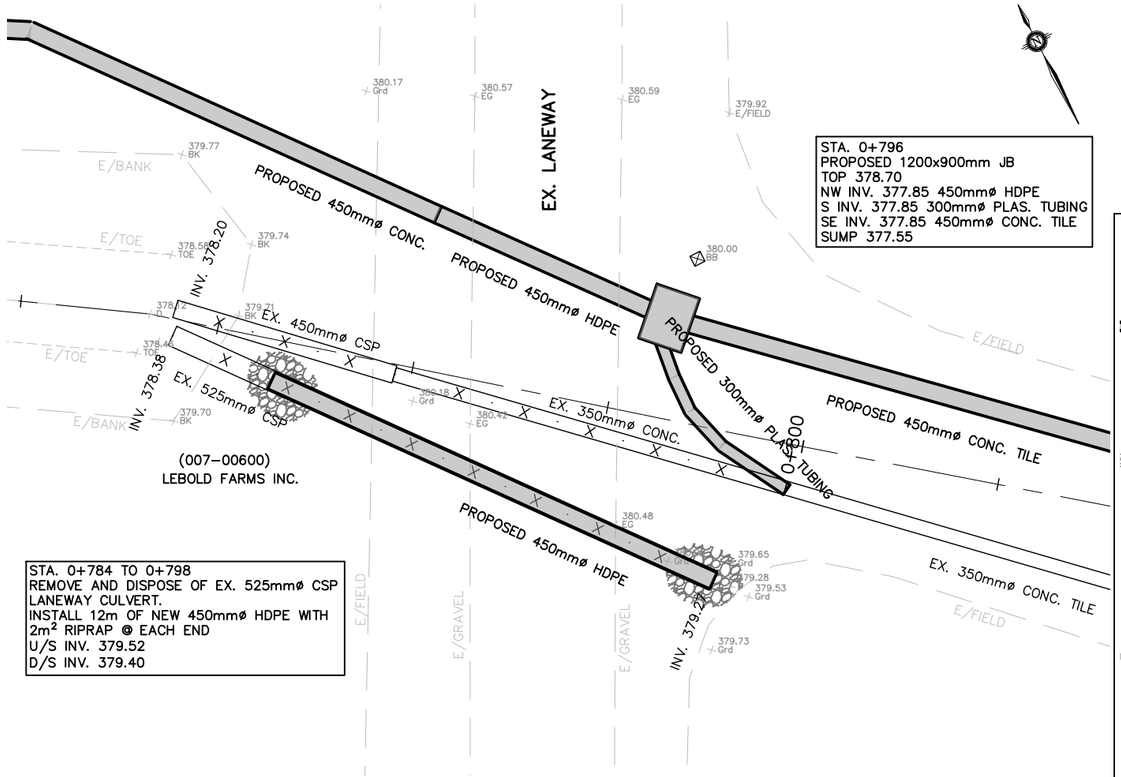
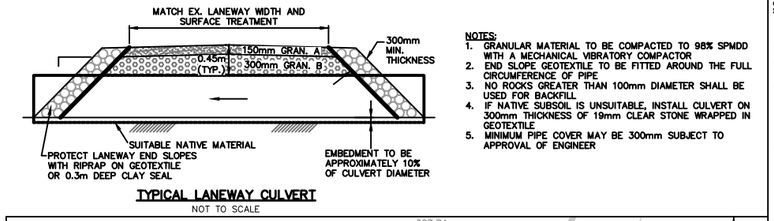


STA. 0+796 DETAIL

0 1.5 3m

SCALE 1:150

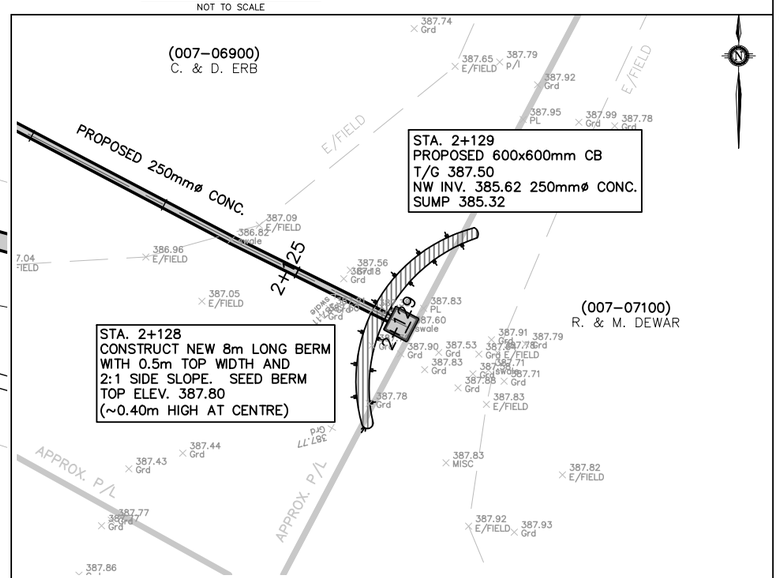


TYPICAL LANEWAY CULVERT

NOT TO SCALE

NOTES:

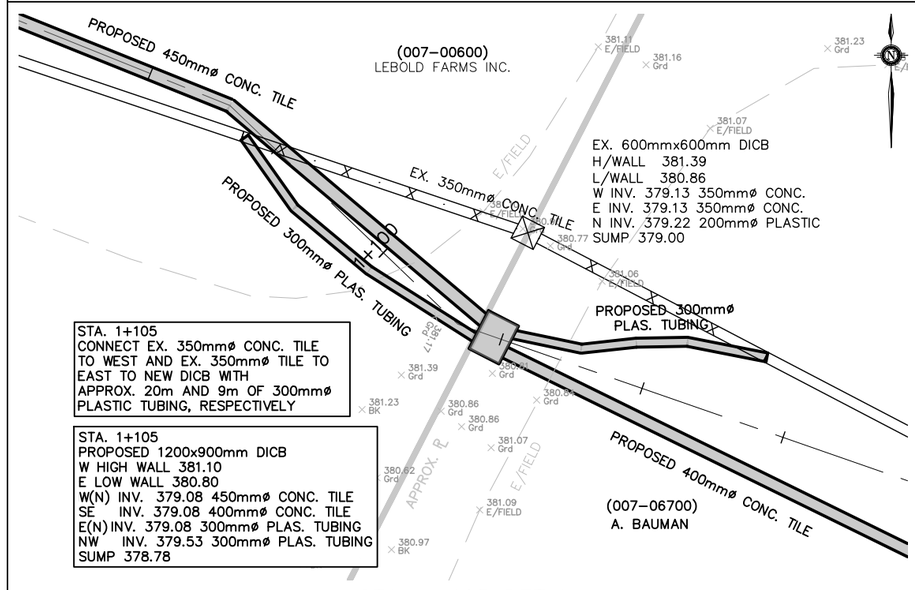
1. GRANULAR MATERIAL TO BE COMPACTED TO 98% SPMDD WITH A MECHANICAL VIBRATORY COMPACTOR
2. END SLOPE GEOTEXTILE TO BE FITTED AROUND THE FULL CIRCUMFERENCE OF PIPE
3. NO ROCKS GREATER THAN 100mm DIAMETER SHALL BE USED FOR BACKFILL
4. IF NATIVE SUBSOIL IS UNSUITABLE, INSTALL CULVERT ON 300mm THICKNESS OF 19mm CLEAR STONE WRAPPED IN GEOTEXTILE
5. MINIMUM PIPE COVER MAY BE 300mm SUBJECT TO APPROVAL OF ENGINEER



STA. 2+129: DETAIL

0 2 4m

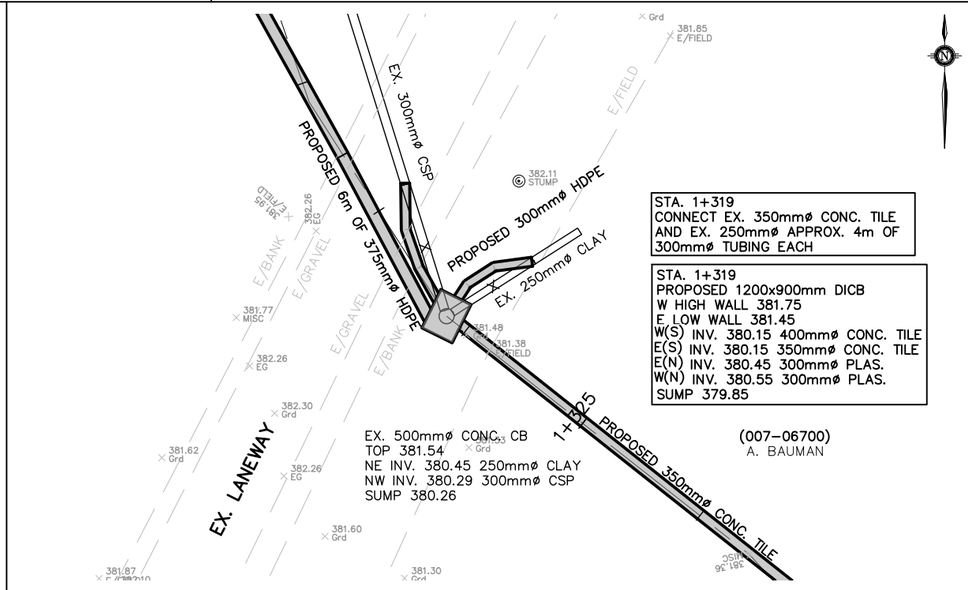
SCALE 1:200



STA. 1+105 DETAIL

0 2 4m

SCALE 1 : 200



STA. 1+319 DETAIL

0 2 4m

SCALE 1:200

SPECIAL PROVISIONS – CONSTRUCTION NOTES:

300.2) CONSTRUCTION SPECIFICATIONS – SPECIFIC NOTES

LEBOLD FARMS INC. (007–06000)

0+484 TO 0+784 – SEE NOTES ON DWG. 2

0+784 TO 0+798 – REMOVE AND DISPOSE OF EX. 525mmø CSP LANEWAY CULVERT. INSTALL 12m OF NEW 450mmø HDPE WITH 2m² RIPRAP AT EACH END. RESTORE LANEWAY TO EXISTING CONDITIONS AS PER "TYPICAL LANEWAY CULVERT" DETAIL.

0+790 TO 0+796 – REMOVE AND DISPOSE OF EX. 350mmø CONCRETE TILE & 450mmø CSP OUTLET PIPE UNDER LANEWAY. INSTALL LAST 6m OF 450mmø HDPE PIPE TO JUNCTION BOX UNDER LANEWAY. RESTORE LANEWAY TO EXISTING CONDITION AS PER "TYPICAL LANEWAY CULVERT" DETAIL.

0+796 – INSTALL 900x1200mm CONCRETE JUNCTION BOX, INCLUDING CONNECTIONS AND CONCRETE LID.

0+796 TO 1+105 – SEE NOTES ON DWG. 2

1+105 – REMOVE AND DISPOSE OF EX. 600x600mm DITCH INLET CATCHBASIN.
– INSTALL 900x1200mm DITCH INLET CATCHBASIN, INCLUDING CONNECTIONS, BIRDCAGE GRATE, AND MARKER

1+105 TO 1+319 – SEE NOTES ON DWG. 3

1+319 – REMOVE AND DISPOSE OF EX. 500mmø CONC. CB
– INSTALL 900x1200mm CONCRETE DITCH INLET CATCH BASIN, INCLUDING CONNECTIONS, BIRDCAGE GRATE, AND MARKER

C. & D. ERB (007–06900)

2+044 – SEE NOTES ON DWG. 3

2+128 – CONSTRUCT 8m OF NEW BERM AS PER DETAIL. USE SUITABLE MATERIAL LOCATED OUTSIDE EDGE OF FIELD, DIRECTLY UPSTREAM OF PROPOSED BERM.

2+129 – INSTALL 600x600mm CONCRETE CB INCLUDING CONNECTIONS, BIRDCAGE GRATE, AND MARKERS

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DESIGNED BY: C.J.M.
CHECKED BY: J.W.K.
DRAWN BY: M.C.J.
CHECKED BY: C.J.M.

LICENSED PROFESSIONAL ENGINEER
C. J. MACINTYRE
100507574
MAY 30, 2024
PROVINCE OF ONTARIO

SCALE

AS SHOWN

LEBOLD DRAIN

REGION OF WATERLOO — TOWNSHIP OF WELLESLEY

DETAILS (2)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

MAY 30, 2024
JOB NUMBER: 06–146
DRAWING 5 OF 8

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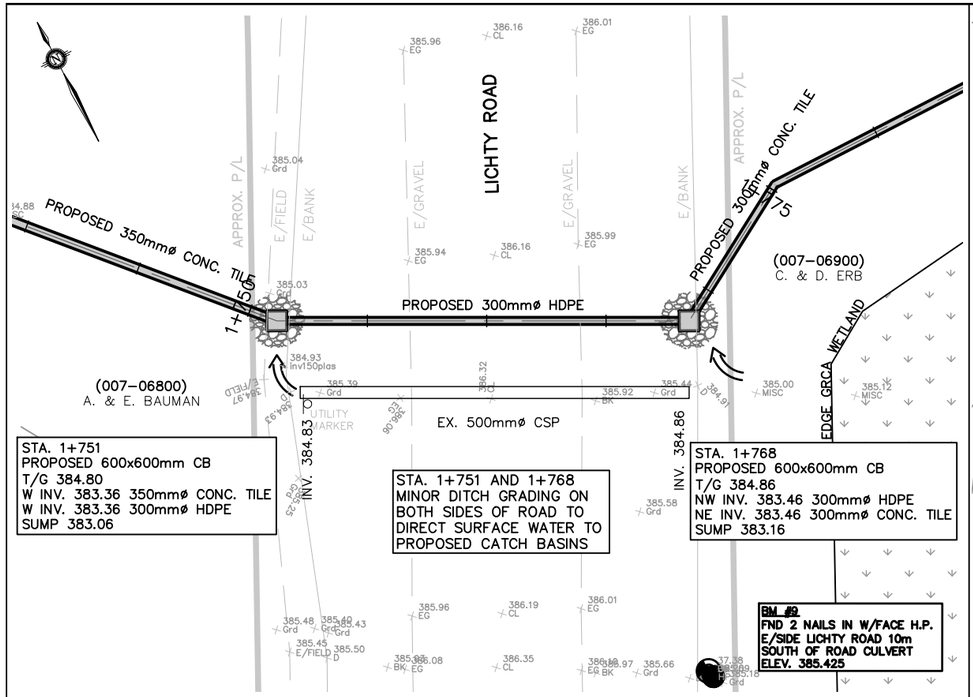
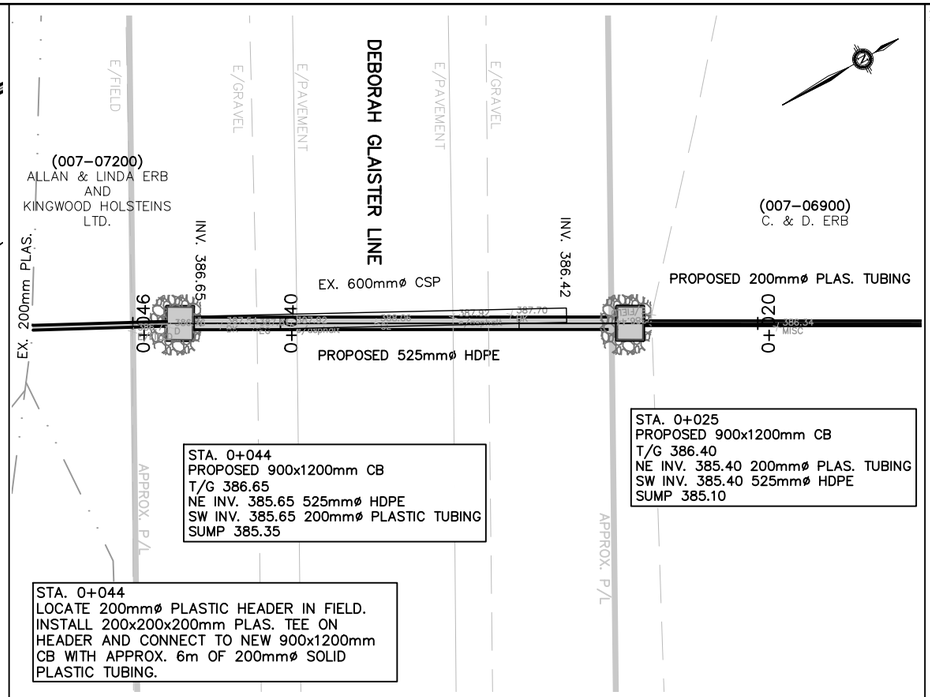
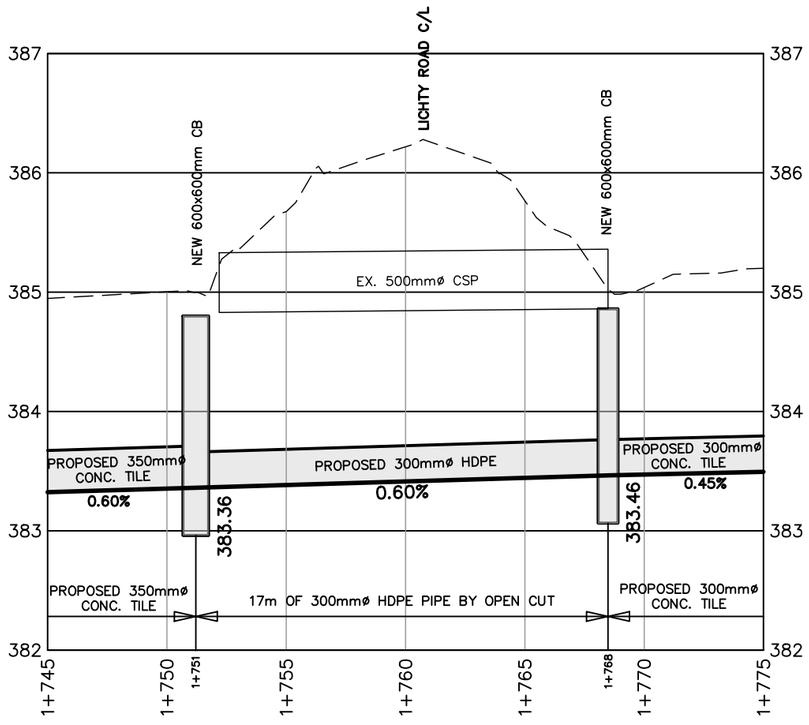
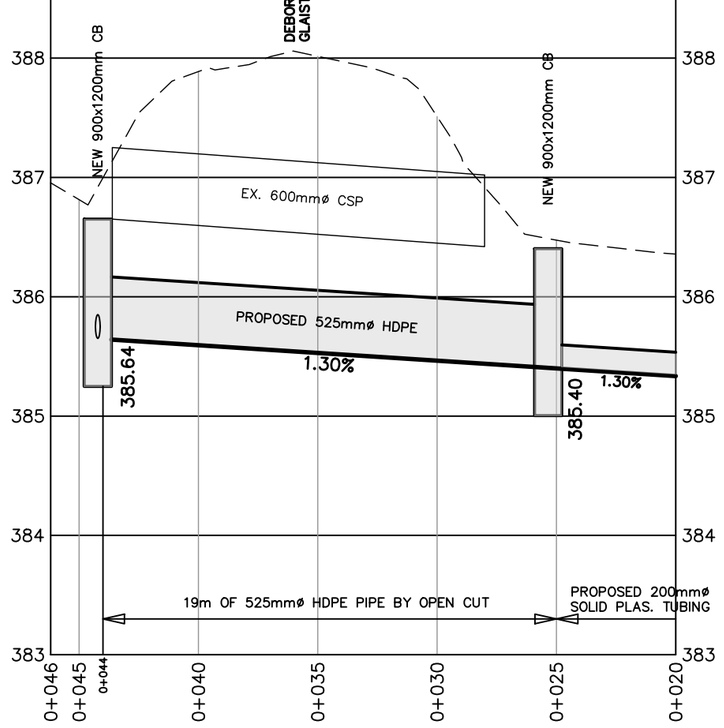






LICHTY ROAD CROSSING



DEBORAH GLAISTER LINE CROSSING

SPECIAL PROVISIONS – CONSTRUCTION NOTES:

300.2) CONSTRUCTION SPECIFICATIONS – SPECIFIC NOTES

TOWNSHIP OF WELLESLEY (LICHTY ROAD)

1+751
- –INSTALL 600x600mm CONC. CB, INCLUDING CONNECTIONS, BIRDCAGE GRATE, MARKERS, AND 2m² OF RIPRAP ON GEOTEXTILE

1+751 TO 1+768
- –INSTALL 17m OF 300mmø HDPE PIPE CROSSING OF LICHTY ROAD BY OPEN CUT, INCLUDING BACKFILL AND ROAD RESTORATION (SEE DETAIL ON DRAWING 8).
- –BEDDING & BACKFILL FOR THIS CROSSING:
  - •BEDDING TO BE 150mm GRANULAR A, SHAPED FOR PIPE.
  - •PIPE BACKFILL TO BE GRANULAR B TO A DEPTH OF 300mm ABOVE THE PIPE, COMPACTED UNDER HAUNCHES. REMAINING BACKFILL TO ROAD BASE TO BE WITH NATIVE MATERIAL.
- –RECONSTRUCTION OF ROAD FOR THIS CROSSING:
  - •600mm OF GRANULAR B
  - •150mm OF GRANULAR A
- –MINOR DITCH GRADING ON BOTH SIDES OF ROAD TO DIRECT SURFACE WATER TO PROPOSED CATCHBASIN

1+768
- –INSTALL 600x600mm CONC. CB, INCLUDING CONNECTIONS, BIRDCAGE GRATE, MARKERS, AND 2m² OF RIPRAP ON GEOTEXTILE

BRANCH 1

0+025
- –INSTALL 900x1200mm CONC. CB, INCLUDING CONNECTIONS, BIRDCAGE GRATE, MARKERS, AND 2m² OF RIPRAP ON GEOTEXTILE.

0+025 TO 0+044
- –REMOVE AND DISPOSAL OF EXISTING 600mmø CSP UNDER DEBORAH GLAISTER LINE.
- –INSTALL 19m OF 525mmø HDPE PIPE CROSSING OF DEBORAH GLAISTER LINE BY OPEN CUT, INCLUDING BACKFILL AND ROAD RESTORATION (SEE DETAIL ON DRAWING 8). CONTRACTOR TO DISPOSE OF EXISTING ASPHALT, UNLESS OTHER ARRANGEMENTS MADE WITH THE TOWNSHIP.
- –BEDDING & BACKFILL FOR THIS CROSSING:
  - •BEDDING TO BE 150mm GRANULAR A, SHAPED FOR PIPE.
  - •PIPE BACKFILL TO BE GRANULAR B TO A DEPTH OF 300mm ABOVE THE PIPE, COMPACTED UNDER HAUNCHES. REMAINING BACKFILL TO ROAD BASE TO BE WITH NATIVE MATERIAL.
- –RECONSTRUCTION OF ROAD FOR THIS CROSSING:
  - •600mm OF GRANULAR B
  - •150mm OF GRANULAR A
  - •60mm THICKNESS OF HL8 BASE COARSE, 40mm THICKNESS OF HL4 SURFACE COURSE.

0+044
- –INSTALL 900x1200mm CONC. CB, INCLUDING CONNECTIONS, BIRDCAGE GRATE, MARKERS, AND 2m² OF RIPRAP ON GEOTEXTILE.
- –SEE ADDITIONAL NOTES ON DETAIL FOR CONNECTING EX. TILE.

No.	DESCRIPTION	DATE
1	ISSUED FOR GRCA REVIEW	APR. 15, 2024
2	ISSUED FOR REPORT	MAY 30, 2024
3	ISSUED FOR TENDER	
4	ISSUED FOR CONSTRUCTION	
5	AS-BUILT	

DESIGNED BY: C.J.M.
CHECKED BY: J.W.K.
DRAWN BY: M.C.J.
CHECKED BY: C.J.M.

LICENSED PROFESSIONAL ENGINEER
C. J. MACINTYRE
100507574
MAY 30, 2024
PROVINCE OF ONTARIO

SCALE
0 2.5 5m
SCALE 1:250 HORZ.
0 0.5 1m
SCALE 1:50 VERT.

LEBOLD DRAIN

REGION OF WATERLOO — TOWNSHIP OF WELLESLEY

DETAILS (3)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

MAY 30, 2024
JOB NUMBER: 06-146
DRAWING 6 OF 8

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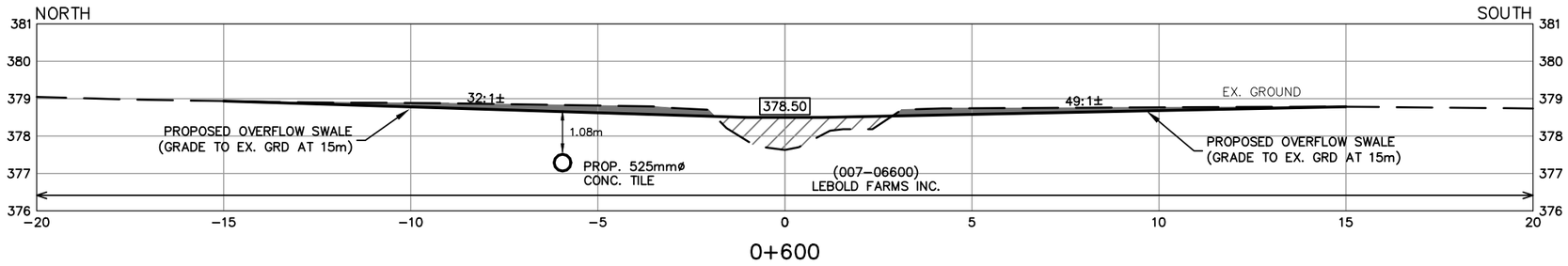

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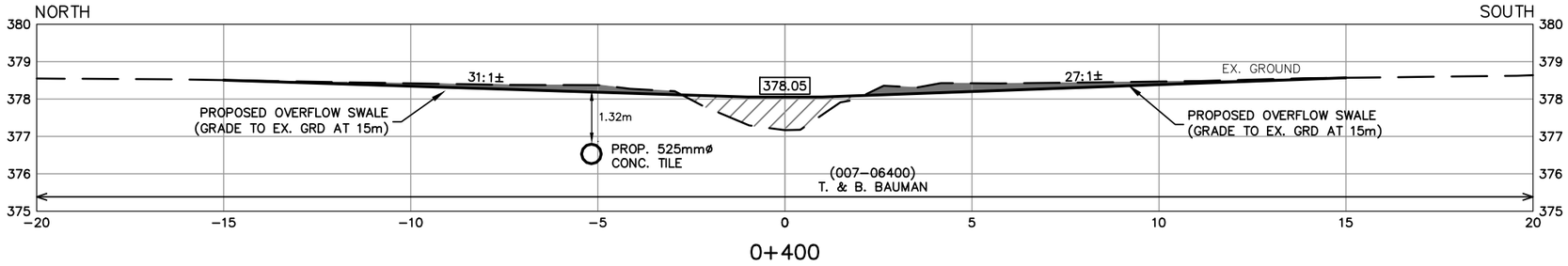

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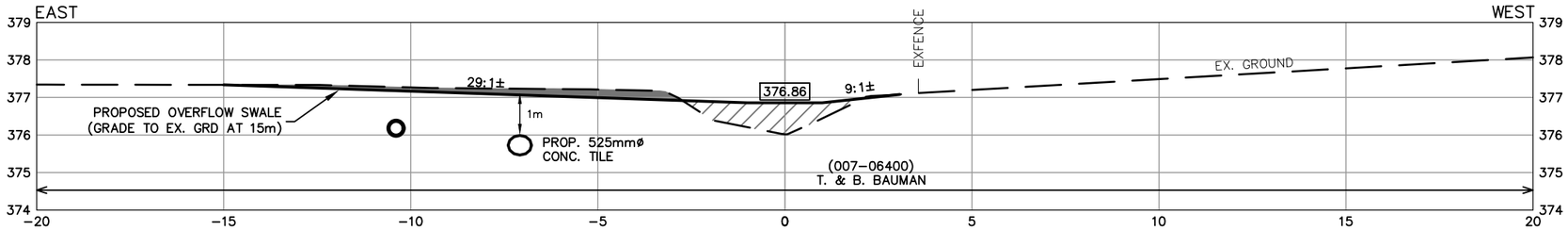

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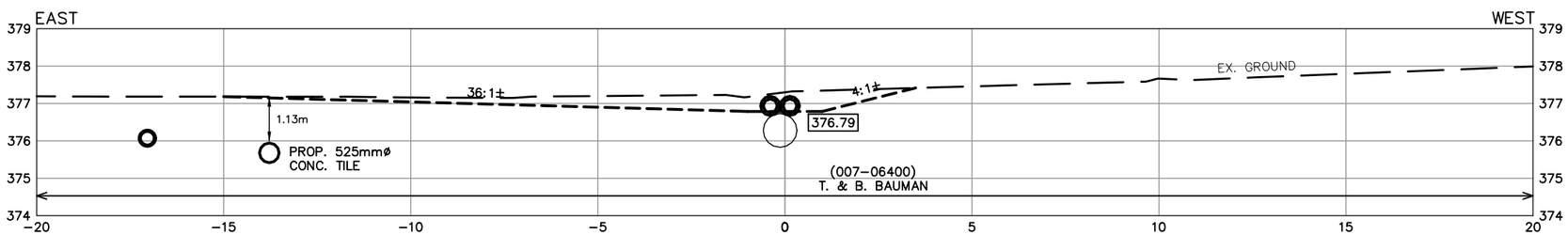

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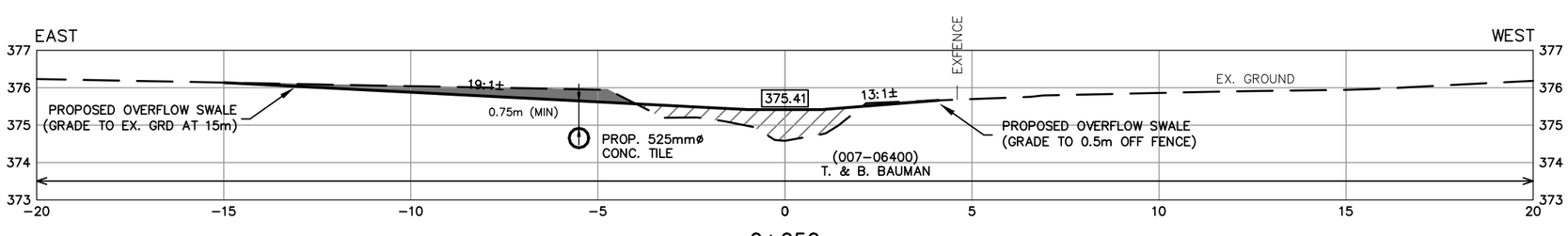

0+050

SPECIAL PROVISIONS – CONSTRUCTION NOTES:

300.2) CONSTRUCTION SPECIFICATIONS – SPECIFIC NOTES

T. & B. BAUMAN (007-06400)

0+000 TO 0+484
- BACKFILL EXISTING DITCH BY KNOCKING IN BANKS AND GRADING OUT INTO FIELD IN BOTH DIRECTIONS.
- PRIOR TO BACKFILLING, STRIP TOPSOIL FROM DITCH, BANKS AND FIELD FOR PROPOSED GRADING LIMITS.
- SPREAD TOPSOIL OVER FILLED DITCH AND GRADE SWALE TO APPROXIMATE GRADE LINE ON PROFILE (5m BOTTOM WIDTH, 20 TO 30:1 SIDE SLOPE)

*NOTE: FROM STATION 0+000 TO 0+315, AN EXISTING PAIGE WIRE FENCE IS LOCATED AT THE TOP OF THE WEST BANK. DITCH BACKFILL TO COMMENCE 0.5m OFF EXISTING FENCE.

LEBOLD FARMS INC (007-06600)

0+484 TO 0+784
- BACKFILL EXISTING DITCH BY KNOCKING IN BANKS AND GRADING OUT INTO FIELD IN BOTH DIRECTIONS.
- PRIOR TO BACKFILLING, STRIP TOPSOIL FROM DITCH, BANKS AND FIELD FOR PROPOSED GRADING LIMITS.
- SPREAD TOPSOIL OVER FILLED DITCH AND GRADE SWALE TO APPROXIMATE GRADE LINE ON PROFILE (2m BOTTOM WIDTH, 20 TO 30:1 SIDE SLOPES)

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4	ISSUED FOR CONSTRUCTION	
5	AS-BUILT	

DESIGNED BY: C.J.M.
CHECKED BY: J.W.K.
DRAWN BY: M.C.J.
CHECKED BY: C.J.M.

LICENSED PROFESSIONAL ENGINEER
C. J. MACINTYRE
100507574
MAY 30, 2024
PROVINCE OF ONTARIO

SCALE
0 1.5 3m
(SCALE 1 : 150)
(ON 11"x 17")

LEBOLD DRAIN

REGION OF WATERLOO — TOWNSHIP OF WELLESLEY

SECTIONS (EX. DITCH BACKFILL)

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER — SUDBURY

MAY 30, 2024
JOB NUMBER: 06-146
DRAWING 7 OF 8

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300) CONSTRUCTION NOTES (SPECIAL PROVISIONS)

300.1) CONSTRUCTION SPECIFICATIONS - GENERAL NOTES

1. Working Area for Construction

For a closed drain the working area shall be a 12.5m width on either side of the trench or any combination not exceeding 25m.
For an open drain the working area shall be an approximate 30m width, except in locations of fence lines. See Sections on dwg. 7 for details.

After the drain is constructed, the working area for the purpose of future maintenance shall be as specified in S.S. 400.4 of this report.

2. Access

Access to the working area shall be from road allowances and as designated on the drawings and/or specific notes. No other access routes shall be used unless first approved by the Engineer and the affected landowner. Specifications related to construction will apply to the access routes. Contractor shall make good any damages caused by using the designated access routes.

3. Pre and Post Construction Meetings

The Contractor may be required to attend pre-and post-construction site meetings with the Engineer and landowners before starting and after finishing the work if requested.

4. Pre-locates

Cross trenches to be dug along entire length of Main Drain route at 100 to 200m intervals (minimum) prior to commencing construction so that true alignment of new drain may be established alongside existing drain without cutting off private lateral tiles. The frequency of pre-locating will depend on the alignment of the existing drains. More pre-locates will be necessary in a meandering route than in a route that is consistently straight.

5. Tile Drain Work

Refer to Specific Notes and 420 – Standard Specifications for Tile Drains.

TYPICAL NOTES FOR EACH NEW TILE LENGTH

1. Maintain all existing headers. Locate as part of *"4. Pre-locates"*
2. Ensure any connections to the old drain are connected/outletted to the new drain. All intercepted lateral tile are to be flagged so the Engineer can GPS.
3. On straight runs, ensure tile joints are parallel (maximum 12mm (½") gap), and tile wrap is flat, covers joint evenly and has overlap.
4. On curved runs, ensure tile joints are touching on one side with maximum gap of 12mm (½") on opposite side. Bevel cut tile or use elbow sections where curves are greater. Tile wrap to be flat, cover joints evenly and have overlap.

6. Concrete Tile Installation

New tile to be installed by tiling (wheel) machine with joints tightly wrapped and topsoils to be separately stripped and replaced to width of machine plus width of spoil pile. For further materials information, refer to Standard Specification for Construction of Drains, Section 400.15.1. For information regarding installation procedure of concrete tile, refer to Standard Specification for Tile Drains, Section 420.3.5.1.

If backhoe methods are approved by engineer, the following shall be attended to: additional topsoils may need to be stripped and replaced, a shaped bottom to be provided and careful tamping around the tile is necessary. Final excavation to grade to be by hand and a shaped bottom to be provided. The Engineer may require a thin lift of stone bedding also as part of usage of backhoe if the native ground/shaped bottom is not satisfactory for long term integrity of the tile.

7. Solid Plastic Pipe or High Density Polyethylene Pipe (HDPE)

Solid plastic pipe to be high density polyethylene (HDPE) double wall (corrugated on the outside and smooth wall on the inside), such as BOSS 2000 Series 320 kPa or equal. Pipe material shall conform to CSA B182.8. Refer to Standard Specification for Tile Drains, Section 420.3.5.3 for installation on plastic pipe.

8. Tile Connections

The Contractor is to verify with each owner prior to starting, any systematic drainage scheme existing on each property and is to make provisions for connecting all headers and laterals.

All subsurface drainage tile encountered along the route of the proposed closed drain are to be connected up to the new drain if the intercepted tile are clean and do not contain polluted water.

All tile connections are to be flagged by the Contractor so the Engineer can GPS the location for future reference. The payment for connections is to be as set out in the tender form.

Refer to Standard Specification of Tile Drains, Section 420.3.7 for further information on tile connections.

9. Catchbasins and Junction Boxes

Catchbasins shall have secured grates and marker stakes. Grates are to be birdcage grates as manufactured by Coldstream Concrete or approved equal, unless otherwise specified in the Specific Notes. All grates are to be secured with non-corrosive fasteners. Marker stakes as supplied by Coldstream Concrete or equal are to be placed beside each catchbasin. Backfill around all new catchbasins and junction boxes is recommended to be compacted 19mm clear crushed stone to avoid future settlements and Contractor obligations to repair such and to ensure connected tile has granular backfill.
All catchbasin sumps to be fully cleaned by the Contractor after completion of drain installation and backfilling.

Refer to Standard Specification for Tile Drains, Section 420.3.13 and 420.3.14 for more details.

10. Utilities

The Contractor shall arrange with all local utility companies (telephone, gas, hydro) to verify the location of all utilities within road allowances and on private lands. All utilities shall be exposed to the satisfaction of the utility company to verify that their elevations will not conflict with the construction of the drain at the specified elevations. Provisions for protection and relocation of utilities that conflict with the drain as designed will be determined at the time of construction.

11. Seeding of Non-Lawn Areas

For seeding use mechanical (cyclone) spreader (or approved equal) and the following shall apply:
Seed mixture to be applied at 60kg/ha and to be as follows:
i) Ditch banks and roadside ditches
35% Creeping Red Fescue
25% Birdsfoot Trefoil
25% Kentucky Bluegrass
10% Cover Crop (Oats, Rye, Barley, Wheat)
5% White Clover

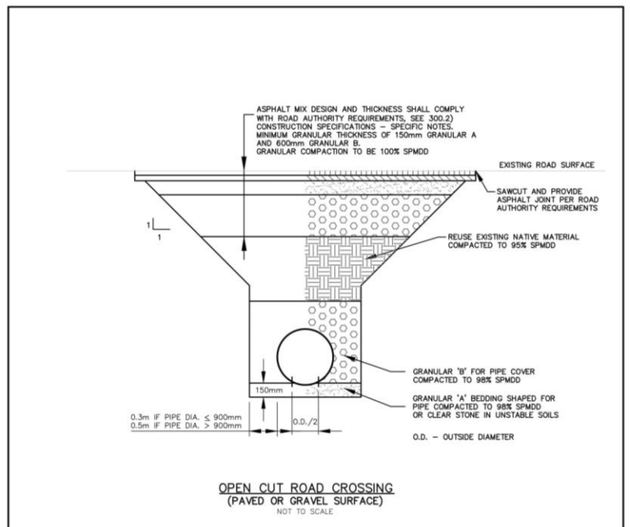
To provide temporary cover for late fall planting add as additional 10 kg/ha of rye or winter wheat. Areas that remain grassed after excavation may not need to be seeded as directed by the Engineer.
Contractor responsible for additional seeding to provide uniform catch during one year maintenance period.

12. Open Cut Road Crossings (Township Roads)

The Road Authority is to be given 72 hours' notice of construction within their right-of-way. Proper detour signing in accordance with MTO signing manual to be used where roads are closed or restricted. Contractor is responsible to repair any settlement which occurs within warranty period. The location of the road crossing shall be confirmed with the Engineer and Road Authority prior to excavation. The Trench Detail on this drawing and the special construction notes shall also apply. If the Road Authority requires granular rather than native material backfill where native is allowed on the Trench Detail, additional payment will be allowed. Where granular is shown to be required, such is to be included as part of the tender. All surplus materials are to be hauled away. In the boulevards, topsoils shall be separately stripped and replaced. Seeding is required. All backfill to be compacted to 98% SPMDD. Pipe materials are to be as noted in the specific construction notes. All old crossings are to be located, removed and disposed of. If so noted, some may remain but are to be fully sealed with pumped concrete as part of the tender.

13. 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 weight tickets and the suppliers invoice.



OPEN CUT ROAD CROSSING
(PAVED OR GRAVEL SURFACE)
NOT TO SCALE

NOTES:

1. BACKFILL AND COMPACTION REQUIREMENTS ALSO APPLY BEYOND THE SHOULDER AT A 1:1 SLOPE DOWN TO THE BOTTOM OF TRENCH EXCAVATION.
2. NEW FROST TAPER NOT REQUIRED UNLESS REQUESTED AT TIME OF CONSTRUCTION. BLEND INTO EXISTING TAPERS. IF REQUIRED, TAPERS TO BE IN ACCORDANCE WITH OPSD 803.03 AND ADDITIONAL PAYMENT WILL BE ALLOWED.
3. ALL SURPLUS EXCAVATED MATERIAL TO BE HAULED AWAY.
4. ASPHALT SHALL COMPLY WITH APPLICABLE OPSS MATERIAL SPECIFICATIONS.
5. IN INITIAL CONSTRUCTION SEASON ALL LIFTS OF ASPHALT SHALL BE PLACED IF CONDITIONS ARE SUITABLE. IF CONDITIONS ARE POOR, TEMPORARY ASPHALT MAY BE REQUIRED UNTIL FOLLOWING CONSTRUCTION YEAR.
6. ADDITIONAL (GENERAL) INSTRUCTIONS ON COMPLETION OF ROAD CROSSINGS ARE FOUND IN K. SMART ASSOCIATES LIMITED SECTION 400 – "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF DRAINS" 400.20.2.

K. SMART ASSOCIATES LIMITED
CONSULTING ENGINEERS AND PLANNERS
KITCHENER SUDBURY

DETAIL DRAWING NO.
SD–13
(MODIFIED)

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PROFESSIONAL ENGINEER
LICENSED
C. J. MACINTYRE
100507574
May 30, 2024
PROVINCE OF ONTARIO

LEBOLD DRAIN

Region of Waterloo
File No. 06-146

Township of Wellesley
May 30, 2024
Drawing 8 of 8