

ENNS DRAIN - HIGHWAY 77 BRANCH

(Philips Engineering Network 8)

MUNICIPALITY OF LEAMINGTON

N. J. Peralta Engineering Ltd.

Consulting Engineers

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Project No. D-07-028C

March 10th, 2011

Mayor and Municipal Council
Corporation of the Municipality of Leamington
38 Erie Street North
Leamington, Ontario
N8H 2Z3

Mayor Paterson and Members of Council:

**SUBJECT: ENNS DRAIN - HIGHWAY 77 BRANCH
(Philips Engineering Network 8)
Municipality of Leamington, County of Essex
Project No. D-07-028C**

I. INTRODUCTION

Further to your instructions as confirmed in a letter dated December 7th, 2007 from Lu-Ann Barreto, Drainage Superintendent, we have proceeded with an Engineer's Report for the creation of the Enns Drain - Highway 77 Branch, located in Lot 6 and Lot 7, Concession 6, Geographic Township of Mersea. The request for the creation of the Enns Drain - Highway 77 Branch was made by the Ministry of Transportation Ontario (M.T.O.).

Our appointment and the works relative to the creation of the Enns Drain - Highway 77 Branch proposed under this report, is in accordance with Section 4.(1)(c) of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2010". We have performed all of the necessary review, investigations, etc., of said affected portion of King's Highway No. 77 and the adjacent affected lands, and we report thereon as follows.

II. BACKGROUND

The M.T.O. has completed the reconstruction of approximately 11.7 kilometres of King's Highway No. 77 between Leamington and Staples. The highway reconstruction included improvements to drainage systems in addition to the general roadway improvements established as necessary for this section of roadway. The M.T.O. arranged for their Consultant, Philips Engineering Ltd., to prepare a "Detailed Design Storm Water Management and Drainage Report" dated March 2008. The Philips report outlines the background information collected and reviewed, field investigations that were done, hydrologic and hydraulic analyses that were carried out, water quality assessments, erosion and sediment control plans, and provides conclusions and recommendations for the drainage improvements. Interested parties may contact the Municipality to review a copy of said report and attachments at the Municipal office.

The drainage improvements included covered drains that are generally located in built-up areas. These covered drains collect water from the roadside ditches and swales and convey same to existing Municipal drainage outlets. The M.T.O.

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

submitted a petition pursuant to Section 4.(1)(c) of the Drainage Act requesting that the covered drains be made into a Municipal drainage works as they will serve both the roadway and adjacent lands. The M.T.O. has paid for all of the construction costs of same. Creation of the covered Municipal drain will provide the necessary mechanisms for future maintenance and upkeep of the drain pursuant to the Drainage Act, and set out the responsibilities for all of the lands and road affected in the sharing of the cost for said future maintenance.

III. PRELIMINARY EXAMINATION AND ON-SITE MEETING

After reviewing all of the drainage information provided by the Municipality of Leamington, the M.T.O. and their Consultant, we prepared preliminary plans based on the drawings from Philips Engineering. We then arranged with the Drainage Superintendent, Ms. Lu-Ann Barreto, to schedule an on-site meeting for September 3rd, 2008. The following people were in attendance at said meeting: Julia Kos, Katherine Kirchhoefer, Heinz Kirchhoefer, John Andary, Dave Hildebrandt (representing Nature Fresh), George Clifford, John Bissonette (M.T.O.), Lu-Ann Barreto (Drainage Superintendent), Tony Peralta (N.J. Peralta Engineering), and Gerard Rood (N.J. Peralta Engineering).

The Owners were advised that only the covered portion of the drains being constructed by the M.T.O. for the highway improvements would become Municipal drains. This is in accordance with discussions with the M.T.O., their Consultant, and the Municipality. The Owners were advised that the proposed drainage system generally comprises a shallow swale with the covered drain offset towards the roadway. Most Owners will have the advantage of being able to connect their storm drainage or sump pump outlets to the proposed new swales. New unpolluted connections shall be made in consultation with the Municipal Drainage Department and M.T.O. and will require an Encroachment Permit from M.T.O. The proposed covered drains will generally replace any existing covered drains in the road right-of-way. All existing connections, unless they are sanitary, will be reconnected to the new drains. Existing unpolluted connections to covered drains will be connected to the new covered drain, and existing unpolluted connections to open drains and swales will be connected to the new open drains or swales. The Municipality will work with the Owner, the Health Unit, and the Ministry of the Environment (M.O.E.) to address any sanitary system problems. The Owners were advised that septic flows could not be allowed to the storm drainage system pursuant to the Municipal Drainage Act and other legislation. Ms. Barreto explained that the Municipality's Building Department would work with individual Owners who require assistance.

The Owners were advised that the roadside swales and ditches will generally comprise 2 horizontal to 1 vertical sideslopes with a minimum 0.5 metre depth, and 0.3% longitudinal grade. The construction of the entire drainage system will be completed

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

along with the road reconstruction and will be paid 100% by the M.T.O.

Owners with water flowing through the new covered drainage systems will share in the future maintenance costs for flushing and cleaning of the system along with any minor repairs that may be carried out. The Owners were advised that the Road Authority would be responsible for any future replacement of the covered drainage systems.

The Owners were further advised that the drainage report will provide the details of the covered drain for the Municipality to use in maintaining the drains, and will also establish the assessment schedule for sharing of future maintenance costs. The Owners were advised that any assessed Owner may notify the Municipality if maintenance of the covered drain is required and the Municipality will be responsible to investigate and remedy any potential problems pursuant to the requirements of the Drainage Act. This should prove to be easier for the Owners than having to contact the M.T.O. or their Maintenance Contractor when drainage concerns arise with the new Municipal drain.

IV. FIELD SURVEY AND INVESTIGATIONS

The M.T.O. and their Consultants generally carried out all of the necessary field surveys and investigation works to allow for the design of the reconstruction of King's Highway No. 77. This included the work required to provide the updated drainage systems for the reconstructed roadway. The entire project was subject to an environmental assessment process that allowed for all parties to provide input on the necessary design parameters and considerations to be made in carrying out the roadway and drainage improvements.

The M.T.O. Consultants carried out the necessary research and modeling work required to demonstrate that the proposed drainage improvements would not adversely impact existing drainage systems. The M.T.O. has carried out the required improvements to various bridges under their roadway to accommodate any changes in flow that occurred for each system. The hydrologic studies have allowed for storm flows from some parcels to be diverted from their current watershed into the adjacent watershed. These have been outlined in the March 2008 "Storm Water Management and Drainage Report" prepared by Philips Engineering for the M.T.O.

Water quality has been addressed through said report and the process noted above. The Philips report also addresses erosion and sediment control, along with temporary flow passage. All of the above details were incorporated by the M.T.O. and their Consultants in carrying out the design and construction of the drainage works and road improvements.

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

As part of our investigations, we reviewed the assessments and watershed areas for adjacent drains to establish the area of parcels that were connected to the constructed drain improvements and that utilize same for their outlet. These investigations have allowed us to determine the values to use in preparing the "Maintenance Schedule of Assessment" as part of this report which shall be utilized when future maintenance works are carried out by the Municipality on the new covered Municipal drain.

V. FINDINGS AND RECOMMENDATIONS

Based on our investigations, examinations, discussions, and determinations at the various meetings held for this project, we would recommend that the covered drainage system designed by Philips Engineering Ltd. and identified by them as "Network 8" become a Municipal drain. The covered drainage system includes catch basins with 600mm deep sumps and storm maintenance holes having 300mm deep sumps. We find that all pipes are minimum low pressure seal gasket joint pipe with all trench backfill comprising of 100% granular materials.

We further find that the M.T.O. has a suitable permit procedure for entrances onto their roadway. This mechanism can continue to be used by them to control access crossings of the road swales and ditches. It was deemed impractical to make all swales and road ditches into Municipal drains due to the complexity of dealing with numerous driveway culverts and the sharing of costs for the future maintenance of each. Pursuant to the Drainage Act each access bridge would become part of the Municipal drain with maintenance costs shared by the Owner and upstream lands. All accesses would need to be brought up to current Municipal standards and the responsibility of the Municipality for numerous minimum sized access culverts would be onerous. Based on all of same, it was deemed most practical to maintain the status quo of these swales and ditches and accesses. Accordingly, we recommend that the roadside swales and ditches will not form part of the Municipal drain and only the covered drain and appurtenances constructed as part of the King's Highway No. 77 reconstruction shall form the Municipal drain. We further recommend that rodent grates be provided on all pipes inletting to or outletting from the covered drainage system as provided for in the M.T.O. Philips design.

We find that the creation of this new Municipal drain will affect the watershed of the Enns Drain, Robert Anderson Drain, McLeod Drain as well as the Lebo Creek Drain. We therefore recommend that the Municipality file copies of this report in said drainage folders for reference when future drainage reports are prepared on said drains so that changes caused by the newly created Municipal drainage system can be accounted for in those future reports.

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

As part of the reconstruction of King's Highway No. 77, the M.T.O. has replaced an existing covered drain on the west side of King's Highway No. 77, locally known as the Stockwell Drain. Based on discussions with Lu-Ann Barreto, Drainage Superintendent, we recommend that the drain known as the Stockwell Drain, be abandoned pursuant to Section 19 of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2010".

We find that all ancillary work required to complete the proper functionality of the new drainage system was conducted and performed as part of the drainage system construction and the Highway 77 reconstruction, and that all of the work conducted and performed as part of said project was completed to the full satisfaction of the M.T.O. and their Consultant, the Municipality's Drainage Superintendent, and the Consulting Engineer.

In summary, we would recommend that the covered drainage system designed by Philips Engineering Inc. and known as "Network 8", and constructed in accordance with the plans and designs prepared by the M.T.O. and their Consultants, become a Municipal drain. We further find that all work was completed in general accordance with this Report, the attached Specifications including the M.T.O. Specifications, and the accompanying Drawings, and all of the works associated with same was carried out pursuant to Section 4.(1)(c) of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2010".

We therefore recommend that this new Municipal drainage system be hereinafter known as the **"ENNS DRAIN - HIGHWAY 77 BRANCH"**.

VI. ALLOWANCES AND COMPENSATION

- (a) We further find that the following Owner is entitled to and should receive the following amount as compensation for the Value of Land Taken, in order to construct the Enns Drain - Highway 77 Branch along the east and west side of King's Highway No. 77, in Lot 6 and Lot 7, Concession 6, namely:

1) Ministry of	Owner,	King's Hwy.	
Transportation Ontario,		No. 77,	\$ 2.00
TOTAL FOR LAND TAKEN (NEW DRAIN)			\$ 2.00

We have provided for this land taken compensation in our estimate, as is provided for under Section 29 of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2010".

This compensation shall allow for all of the land necessary to construct the new Municipal drain, as well as access along the adjacent Municipal right-of-way lands for the

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

future maintenance and upkeep of the covered drainage systems.

We further find that, as a result of the covered drainage system being built during the reconstruction of the highway, any damage resulting from same was totally repaired and restored as part of the reconstruction works of the roadway. We have therefore provided no damage allowances in our estimate pursuant to Sections 29 and 30 of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2010".

A nominal value has been utilized for the land taken to reflect that the new Municipal drain replaces the existing drainage systems that serviced the affected area. The allowance provided shall establish the legal right for the Municipal drain in its new location and establish the right to access along the drain for future maintenance.

VII. ESTIMATE OF COST

Our estimate of the total cost of this work, including all incidental expenses, is the sum of **TWO HUNDRED AND EIGHTY TWO THOUSAND FIVE HUNDRED AND TWO DOLLARS (\$282,502.00)**, made up as follows:

CONSTRUCTION

- | | | | |
|---------|--|----------|--------------|
| Item 1) | Maintenance Hole 172 to Maintenance Hole 175; supply and install approximately 89 lineal metres of 525mm diameter solid heavy duty smoothwall plastic drain tile, including gasket joints, excavation, backfill, compaction, and restoration, complete. | Lump Sum | \$ 17,900.00 |
| Item 2) | Maintenance Hole 175 to Maintenance Hole 177; supply and install approximately 55 lineal metres of 525mm diameter solid heavy duty smoothwall plastic drain tile, including gasket joints, excavation, backfill, compaction, and restoration, complete. | Lump Sum | \$ 11,100.00 |
| Item 3) | Maintenance Hole 177 to Maintenance Hole 180; supply and install approximately 100 lineal metres of 525mm diameter solid heavy duty smoothwall plastic drain tile, including gasket joints, excavation, backfill, compaction, and restoration, complete. | Lump Sum | \$ 23,600.00 |

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

Item 4)	<u>Maintenance Hole 180 to Maintenance Hole 184; supply and install approximately 120 lineal metres of 600mm diameter solid heavy duty smoothwall plastic drain tile, including gasket joints, excavation, backfill, compaction, and restoration, complete.</u>	Lump Sum	\$ 36,400.00
Item 5)	<u>Maintenance Hole 184 to Maintenance Hole 187; supply and install approximately 75 lineal metres of 675mm diameter heavy duty concrete drain pipe, including gasket joints, excavation, backfill, compaction, and restoration, complete.</u>	Lump Sum	\$ 27,800.00
Item 6)	<u>Maintenance Hole 187 to Maintenance Hole 191; supply and install approximately 150 lineal metres of 675mm diameter heavy duty concrete drain pipe, including gasket joints, excavation, backfill, compaction, and restoration, complete.</u>	Lump Sum	\$ 55,500.00
Item 7)	<u>Maintenance Hole 191 to Maintenance Hole 194; supply and install approximately 55 lineal metres of 675mm diameter heavy duty concrete drain pipe, including gasket joints, excavation, backfill, compaction, and restoration, complete.</u>	Lump Sum	\$ 20,400.00
Item 8)	<u>Maintenance Hole 194 to Enns Drain Outlet; supply and install approximately 17 lineal metres of 675mm diameter heavy duty concrete drain pipe, including gasket joints, provide reinforced concrete headwall, rodent grate, excavation, backfill, compaction and restoration, complete.</u>	Lump Sum	\$ 10,400.00
Item 9)	<u>Ditch Inlet Catch Basin 193 to Outlet Pipe; supply and install approximately 13 lineal metres of 300mm diameter solid heavy duty smoothwall plastic drain tile, including gasket joints, connection fittings, excavation, backfill, compaction and restoration, complete.</u>	Lump Sum	\$ 1,200.00

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

Item 10)	<u>Road Crossings, Catch Basin and Open Swale Pipe Connections;</u> supply and install approximately 155 lineal metres of 300mm diameter solid heavy duty smoothwall plastic drain tile, including gasket joints, excavation, backfill, compaction, and restoration, complete.	Lump Sum	\$ 19,300.00
Item 11)	<u>Inlet Grating for Open Swale Connections;</u> supply and install approximately 3 grates, for the 300mm diameter swale inlet pipes, mounted into the plastic pipe ends at the swale outlet including all materials and labour, complete.	Lump Sum	\$ 400.00
Item 12)	<u>Maintenance Holes 172, 175, 177, and 180;</u> supply and install 4 maintenance holes being 1500mm diameter precast concrete maintenance holes with 600mm cast iron frames and lids, 300mm deep sump, including excavation, connections, backfill, compaction and restoration, complete.	Lump Sum	\$ 12,600.00
Item 13)	<u>Maintenance Holes 184, 187, 191, and 194;</u> supply and install 4 maintenance holes being 1800mm diameter precast concrete maintenance holes with 600mm cast iron frames and lids, 300mm deep sump, including excavation, connections, backfill, compaction and restoration, complete.	Lump Sum	\$ 15,700.00
Item 14)	<u>Ditch Inlet Catch Basins 173, 174, 176, 178, 179, 181, 182, 183, 185, 186, 188, 189, 190, 192, and 193;</u> supply and install approximately 15 catch basins being 600mm square precast concrete ditch inlet catch water basins with galvanized frames and honeycomb grates, 600mm deep sumps, including excavation, connections, backfill, compaction, and restoration, complete.	Lump Sum	\$ 16,200.00
TOTAL FOR CONSTRUCTION			\$268,500.00

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

INCIDENTALS

1) Estimated Cost for Report, Estimates and Specifications	\$ 6,970.00
2) Estimated Cost for Assistants, Expenses, and Drawings	\$ 6,680.00
3) Estimated Cost for Duplication of Drawings and Report	\$ 350.00
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TOTAL FOR INCIDENTALS	\$ 14,000.00
TOTAL FOR ALLOWANCES (brought forward)	\$ 2.00
TOTAL FOR CONSTRUCTION (brought forward)	\$268,500.00
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TOTAL ESTIMATE	\$282,502.00
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VIII. DRAWINGS AND SPECIFICATIONS

As part of this report, we have attached design drawings based on the construction plans utilized by the M.T.O. and their Consultant to carry out the necessary King's Highway No. 77 reconstruction. These design drawings included in **Appendix "A"**, show the subject covered drain location and details of the works, completed for the covered drainage system that serves this portion of Highway 77 and the adjacent lands and road.

Also attached, we have prepared specifications which set out the required construction details for the future maintenance of the Enns Drain - Highway 77 Branch.

IX. CONSTRUCTION ASSESSMENT

We would recommend that all of the costs associated with the construction of this new Municipal drain be assessed in accordance with the attached "Construction Schedule of Assessment", including all engineering and incidental expenses, and be totally assessed to the Ministry of Transportation Ontario (M.T.O.) who carried out the reconstruction of King's Highway No. 77 and the installation of the new covered drain. The connection of existing services to the new covered drainage system was completed as part of the pipe installation and all of the associated cost was borne by the M.T.O. as part of their reconstruction of King's Highway No. 77 and creation of the new covered Municipal drain.

Report - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 and Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

X. FUTURE MAINTENANCE

We would recommend that this new Municipal covered drain be kept up and maintained by the Municipality in the future, and the cost for same be assessed as set out in the attached "Maintenance Schedule of Assessment" forming part of this report. The future maintenance of the new covered drain shall be borne by all affected lands and road that utilize the covered drainage system. The attached "Maintenance Schedule of Assessment" for the Enns Drain - Highway 77 Branch is based on an estimated future cost of \$4,000.00. It is to be clearly understood that the values indicated in this "Maintenance Schedule of Assessment" are strictly for the purposes of properly allocating future maintenance costs. When future maintenance work is carried out, the assessment to the affected Owners shall be based on the actual future maintenance costs shared on a pro-rata basis with the values shown in this "Maintenance Schedule of Assessment". We further recommend that the maintenance cost sharing as set out in the attached "Maintenance Schedule of Assessment" shall remain as aforesaid until otherwise determined and amended under the provisions of the "Drainage Act, R.S.O. 1990, Chapter D.17 as amended 2010".

All of which is respectfully submitted.

N. J. PERALTA ENGINEERING LTD.


Antonio B. Peralta, P.Eng.

AP/sa

att.



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CONSTRUCTION SCHEDULE OF ASSESSMENT

ENNS DRAIN - HIGHWAY 77 BRANCH

MUNICIPALITY OF LEAMINGTON

2. ONTARIO LANDS:

<u>Tax Roll No.</u>	<u>Con. of Plan No.</u>	<u>Lot or Part of Lot</u>	<u>Acres Hectares</u>	<u>Aff'd</u>	<u>Owner's Name</u>	<u>Value of Benefit</u>	<u>Value of Outlet</u>	<u>TOTAL VALUE</u>
King's Highway 77			3.94	1.594	Ministry of Transportation Ontario	\$ 141,251.00	\$ 141,251.00	\$ 282,502.00
Total on Ontario Lands.....						\$ 141,251.00	\$ 141,251.00	\$ 282,502.00
TOTAL ASSESSMENT						\$ 141,251.00	\$ 141,251.00	\$ 282,502.00

1 Hectare = 2.471 Acres
 Project No. D07-028C
 March 10th, 2011

MAINTENANCE SCHEDULE OF ASSESSMENT

ENNS DRAIN - HIGHWAY 77 BRANCH

MUNICIPALITY OF LEAMINGTON

2. ONTARIO LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Aff'd	Hectares Aff'd	Owner's Name	Value of Benefit	Value of Special Benefit	Value of Outlet	TOTAL VALUE
King's Highway 77			3.94	1.596	Ministry of Transportation Ontario	\$ 1,006.00	\$ -	\$ 721.00	\$ 1,727.00
Total on Ontario Lands.....						\$ 1,006.00	\$ -	\$ 721.00	\$ 1,727.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Aff'd	Hectares Aff'd	Owner's Name	Value of Benefit	Value of Special Benefit	Value of Outlet	TOTAL VALUE
710-03300	6	7	0.49	0.199	Robert & Sharon Hooper	\$ 63.00	\$ -	\$ 53.00	\$ 116.00
710-03405	6	7	0.40	0.163	Kenneth & Rita Enns	\$ 51.00	\$ -	\$ 50.00	\$ 101.00
710-03505	6	7	0.72	0.290	KOS Greenhouses Ltd.	\$ 91.00	\$ -	\$ 71.00	\$ 162.00
710-03800	6	7	0.34	0.136	Heinrich & Susana Wiebe	\$ 43.00	\$ -	\$ 33.00	\$ 76.00
720-04550	6	6	0.56	0.225	Robert Magri	\$ 71.00	\$ -	\$ 54.00	\$ 125.00
720-04602	6	6	0.33	0.134	Terry & Pamela Allison	\$ 42.00	\$ -	\$ 41.00	\$ 83.00
720-04700	6	6	0.36	0.147	Mark & Violet Watts	\$ 46.00	\$ -	\$ 50.00	\$ 96.00
Total on Privately Owned - Non-Agricultural Lands.....						\$ 407.00	\$ -	\$ 352.00	\$ 759.00

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Tax Roll No.	Con. or Plan No.	Lot or Part of Lot	Acres Aff'd	Hectares Aff'd	Owner's Name	Value of Benefit	Value of Special Benefit	Value of Outlet	TOTAL VALUE
710-03400	6	7	1.63	0.660	Kenneth, Rita & Steven Enns	\$ 104.00	\$ -	\$ 226.00	\$ 330.00
710-03500	6	7	1.47	0.594	KOS Greenhouses Limited	\$ 94.00	\$ -	\$ 132.00	\$ 226.00
710-03600	6	7	2.10	0.850	Manuel & Aurora Pires	\$ 134.00	\$ -	\$ 200.00	\$ 334.00
710-03700	6	7	1.50	0.607	Clement Windsor	\$ 96.00	\$ -	\$ 79.00	\$ 175.00
720-04500	6	6	0.16	0.065	RTM Farms Ltd.	\$ 10.00	\$ -	\$ 34.00	\$ 44.00
720-04600	6	6	1.74	0.702	RTM Farms Ltd.	\$ 111.00	\$ -	\$ 182.00	\$ 293.00
720-04601	6	6	0.60	0.243	Wilhelm & Katharina Berg	\$ 38.00	\$ -	\$ 74.00	\$ 112.00
Total on Privately Owned - Agricultural Lands (grantable).....						\$ 587.00	\$ -	\$ 927.00	\$ 1,514.00

TOTAL ASSESSMENT

\$ 2,000.00 \$ - \$ 2,000.00 \$ 4,000.00

1 Hectare = 2.471 Acres
 Project No. D07-028C
 March 10th, 2011

SPECIFICATIONS

ENNS DRAIN - HIGHWAY 77 BRANCH

(Philips Engineering Network 8,

Part of Lots 6 and 7, Concession 6,

Geographic Township of Mersea)

MUNICIPALITY OF LEAMINGTON

I. GENERAL SCOPE OF WORK

The Enns Drain - Highway 77 Branch is located entirely within the boundaries of the Municipality of Leamington, consisting of a covered drain and appurtenances within Lots 6 and 7, Concession 6, Geographic Township of Mersea. The newly constructed covered drainage system will provide outlet drains along the east and west sides of King's Highway No. 77 north of Mersea Road 6. The system will outlet to the existing open portion of the Enns Drain along the west side of Highway 77. The drainage system was constructed in the locations and to the parameters as shown and detailed on the plans and to the specifications forming part of Contract No. 2008-3007 as issued by the Ministry of Transportation Ontario (M.T.O.) for the reconstruction of King's Highway No. 77 and its drainage systems. The M.T.O. Specifications are included in **Appendix "C"**. The construction comprised of the installation of a new covered drain along the east side of King's Highway No. 77, including the installation of road crossings from the west side, catch water basins, swale outlet pipes, maintenance holes and connections, and other ancillary work required in order to provide a complete and satisfactory job. All work has been carried out as generally shown in the accompanying drawings and as specified herein. The work also included the removal and disposal of existing surplus materials and debris that resulted as part of the construction of the new drainage system. It is to be noted that the construction of the new Municipal drain was completed as part of the total road reconstruction of King's Highway No. 77 carried out by the Ministry of Transportation Ontario (M.T.O.), their Consultants, and Contractors. This drain shall be maintained in the future through the Municipality of Leamington in accordance with the accompanying drawings (Sheets No. 1 to 10 inclusive), these specifications, and the M.T.O. Specifications in Appendix "C" attached hereto.

The Contractor will be required to implement stringent erosion and sedimentation controls during the course of the work to minimize the amount of silt and sediment carried downstream into the Enns Drain. It is intended that maintenance work on this project be carried out during relatively dry conditions to ensure proper trench conditions and to avoid conflicts with sediment being deposited into the Municipal outlet of the drainage system. The Contractor is expected to implement control measures including, but not limited to, utilizing silt fences and straw bales in the drain and swale bottoms to reduce the amount of sediment escaping downstream of the work. As an integral part of the erosion and sedimentation control, the Contractor is required to carry out the topsoil placement, and seeding and mulching of all disturbed areas of the drainage works on a timely basis so that no portion of the disturbed drain are left exposed for an extended length of time. The

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

Contractor shall monitor and clean out the sediment controls as necessary, and remove same once a good vegetative cover has been established along the drainage works, and the Drainage Superintendent advises that the controls are no longer required.

All of the work shall be carried out in accordance with all Permits or Authorizations issued by the Essex Region Conservation Authority (E.R.C.A.), the Department of Fisheries and Oceans (D.F.O.), and the Ministry of Natural Resources (M.N.R.). When carrying out future maintenance work the Contractor and Municipality shall coordinate any required work permits from the Road Authority.

II. ACCESS TO WORK

The Contractor is advised that the majority of the work to be carried out on this project extends along King's Highway No. 77. The Contractor may utilize the full road right-of-way as necessary to carry out its operations, ensuring that the traveling public is protected at all times.

Along the outlet to the Enns Drain, the Contractor shall have access to an 8.0 metre wide strip of land. This 8.0 metre easement for installation of the outlet drain shall be measured perpendicular and parallel to the centreline of the drain outlet measured 4.0 metres to the north and 4.0 metres to the south of the drain centreline. This access shall extend all the way from King's Highway No. 77 westerly to the outlet into the Enns Drain to allow for installation of the complete outfall for the drainage system.

Throughout the course of the work, it is imperative that the Contractor protect as much landscaping and vegetation as possible when accessing along the drain. This is a particular concern along the lawn areas of residential properties. Due to the extent of the work and the area for carrying out the work, the Contractor is required to carry out all of the necessary steps to direct traffic and provide temporary diversion of traffic around work sites, including provision of all lights, signs, flag persons, and barricades required to protect the safety of the traveling public. Any accesses or areas utilized in carrying out the works shall be fully restored to their original conditions by the Contractor, including topsoil placement and lawn restoration, as directed by the Engineer or the Municipal Drainage Superintendent. Restoration shall include, but not be limited to, levelling, grading, shaping, topsoil placement and granular required to make good on any damage caused. Where the edges of asphalt roadways or driveways are damaged, the Contractor shall remove the broken material and restore the area using hot mix asphalt HL-3. The Contractor shall dispose of all removed material, compact the HL-3 asphalt mix and complete all repairs to the full satisfaction of the Municipal Drainage Superintendent, the Engineer, and the Road Authority. When requested by the Municipal Drainage Superintendent or the Engineer, the Contractor shall provide dust control measures on roadways and driveways to reduce the dust nuisance to adjacent properties. All mud and debris shall

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

be scraped from the driveways and roadways, and additional granular placed if necessary, to restore the driveways, road and shoulders to their pre-construction conditions.

The Contractor shall note that any deviation from the above mentioned access to the site of the works without the explicit approval by the landowner and the Municipal Drainage Superintendent or Engineer shall result in the Contractor being liable for damages sustained. Value for such damages shall be determined by the Engineer and Municipal Drainage Superintendent, and be subsequently deducted from the Contract Price.

III. REMOVAL OF BRUSH, TREES AND RUBBISH

Where there is any brush, trees or rubbish along the course of the drain, including the full width of the access, all such brush, trees or rubbish shall be close cut and grubbed out, and the whole shall be burned or otherwise satisfactorily disposed of by the Contractor. The brush and trees removed along the course of the work shall be put into piles by the Contractor in locations where they can be safely burned by it. Prior to and during the course of the burning operations, the Contractor shall comply with the guidelines prepared by the Air Quality Branch of the Ontario Ministry of the Environment, and ensure that the Environmental Protection Act is not violated. The Contractor will be required to notify the local fire authorities and co-operate with them in the carrying out of any work. The removal of brush and trees shall be carried out in close consultation with the Municipal Drainage Superintendent or Engineer to ensure that no decorative trees or shrubs that can be saved will be disturbed by the operations of the Contractor. It is the intent of this project to save as many trees and bushes as practical within the roadway allowances.

Following the completion of the work, the Contractor shall trim up any broken or damaged limbs on trees which are to remain standing, and shall dispose of said branches along with other brush, thus leaving the trees in a neat and tidy condition.

IV. FENCING AND DECORATIVE LANDSCAPING

Where it is necessary to take down or remove any fence or decorative landscaping to proceed with the work, the same shall be done by the Contractor across or along that portion of the work where such fence or decorative landscaping is located. The Contractor is required to exercise extreme care in the removal of any fencing or decorative landscaping so as to cause a minimum of damage to the same. The decorative landscaping material such as brick driveways, retaining walls, plants and bushes shall be carefully put aside so that the owners can re-use or dispose of the material. Any materials no longer required by the owners, shall be disposed of by the Contractor.

The Contractor is required to replace any fence that is taken down in order to proceed with the work, and the fence shall be

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

replaced in a neat and workmanlike manner. The Contractor is not required to procure any new materials for rebuilding the fence provided that it has used reasonable care in the removal and replacing of the same. When any fence is removed by the Contractor, and the owner thereof deems it advisable and procures new materials for replacing the fence so removed, the Contractor shall replace the fence using the new materials and the materials from the present fence shall remain the property of the owner.

V. COVERED DRAINAGE SYSTEM

The Contractor shall construct a new covered drain as shown and detailed on the accompanying drawings. The drain shall be constructed to the lines, levels, grades and cross-sections as shown on the accompanying drawings, or as further established by the Engineer at the time of construction.

Along the course of the covered drain, the Contractor shall supply and install road crossings, catch water basin and maintenance hole units as shown and detailed in the accompanying drawings. At the locations shown on the drawings, the Contractor shall supply and install new 600mm square precast concrete catch water basins and 1500mm and 1800mm diameter precast concrete maintenance holes. All catch water basins shall be fitted with galvanized steel honeycomb ditch inlet grates to O.P.S.D. standards. Maintenance holes shall be fitted with cast iron frames and grates or lids as denoted in the Schedule of Items and on the drawings and shall meet O.P.S.D. Standards. The precast catch water basins, concrete maintenance holes, honeycomb grating, and cast iron frames and grates or lids are available from Coldstream Concrete Products Limited, Ilderton, Ontario, or equal.

All concrete maintenance holes shall be on line and installed directly overtop of the covered drains.

Concrete Maintenance Holes No. 172, 175, 177, and 180 shall be a precast concrete units 1500mm in diameter as shown and detailed in the accompanying drawings. Concrete Maintenance Holes No. 184, 187, 191, and 194 shall be precast concrete units 1800mm in diameter as shown and detailed in the accompanying drawings. All catch water basins shall comprise of 600mm square precast concrete units as shown and detailed on the accompanying drawings. The 1500mm and 1800mm diameter Maintenance Holes shall be fitted with precast concrete tops, having a 600mm diameter opening, and include cast iron frames and lids, as provided for in the schedule of items and prices, and as shown on the drawings. For all of the above Maintenance Holes a 300mm deep sump shall be provided and shall be measured from the invert of the new covered drain to the top of the concrete floor.

All concrete catch basins shall be ditch inlet type in accordance with O.P.S.D. 705.030 with sloped tops matching the swale side slopes at the location of same. Each ditch inlet catch basin shall be fitted with a galvanized steel honeycomb

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

grating for ditch inlet as per O.P.S.D. 403.010. For all of the precast catch water basins a 600mm deep sump shall be provided and shall be measured from the proposed invert of the covered drain or connection to the top of the concrete floor. Copies of the O.P.S.D. details are included in Appendix "B" of these specifications.

The top elevation of all catch water basins and grates shall be set approximately 50mm below the ground adjacent to the location of the catch water basin, or to a height directed by the Municipal Drainage Superintendent or the Engineer during construction. The Contractor shall ensure that all units are set to allow for the installation of lift rings as required in accordance with O.P.S.D. requirements. The Contractor shall allow for a minimum of three (3) adjustment units to be installed so that the elevation of the grating can be adjusted up or down as necessary to accommodate current or future grading of the swales and adjacent areas. All lift units shall be installed in accordance with manufacturer's recommendations.

The Contractor shall connect all covered drains in the catch water basins and concrete maintenance holes with the use of a mortar joint. Said mortar joint shall be provided at the exterior of the basin or maintenance hole wall for the full circumference of the covered drain and be of a sufficient mass to produce a sealed joint extending to the inside face of the unit, all performed to the full satisfaction of the Municipal Drainage Superintendent or Engineer.

All grout for the project shall be provided in unopened pre-mixed bags or comprise of three (3) parts clean, sharp sand to one (1) part Portland cement with sufficient water added to provide a stiff plastic mix. Where possible, the Contractor shall employ standard factory fittings or adapters for connections between the various pipes and tiles.

All plastic drain pipe utilized for this project shall comprise of heavy duty smooth wall H.D.P.E. plastic drainage tile, being Big "O" Boss 2000 or equal, with a minimum pipe strength of 210 kPa. All pipes shall be fitted with bell and gasket joints and installed in accordance with the manufacturer's recommendations. During the installation of the covered drain, the Contractor shall remove and dispose of all deleterious materials encountered, to a site obtained by it at its own expense.

All reinforced concrete pipe for this project shall meet CSA A257.2 Class 50-D as a minimum. All concrete pipe shall include rubber gasket joints and be installed in accordance with the manufacturer's recommendations and to all applicable Ontario Provincial Standard Specifications and O.P.S.D. details. During the installation of the covered drain, the Contractor shall remove and dispose of all deleterious materials encountered, to a site obtained by it at its own expense.

All concrete headwalls required for this project shall be in accordance with O.P.S.D. 804.030.

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

All materials shall be stored and handled by the Contractor at its own expense. It shall be responsible for the safe storage of all materials, for obtaining storage areas, for the safe transportation and distribution of all the materials at the job site, and for inspection in order to determine defects and breakage. No additional recompense shall be allowed to the Contractor for any loss incurred by it in the storage and handling of the materials.

Pipe, fittings, and all accessory appurtenances shall be loaded and unloaded by lifting with means of a hoist or a skid to avoid shock or damage. Under no circumstances shall any drain material or materials used for drain appurtenances be dropped.

The covered drain shall be laid in trenches in the general location shown on the accompanying drawings or as specifically directed and laid out by the Engineer at the time of construction. The trench shall be located to clear all existing utilities and structures above, on, or below the ground level. The Contractor shall be responsible at all times for complete investigation to determine the location of all such utilities or structures known or unknown, and it shall indemnify and save harmless the Engineer and the Municipality of Leamington for any responsibility, injury, or liability arising from and damage to such utilities or structures by the Contractor.

The Contractor shall further contact or notify such Utility Company or Commission of its intention to carry out work in the area and shall co-operate with such Utility Company or Commission in the location, maintenance and preservation of all such utilities. The location of the pipes and appurtenances as shown on the drawings are approximate and may be changed by the Engineer if deemed advantageous for the progress of the work. The trenches shall be excavated where directed. If any part of the bottom of the trench is found to be unsound or in any way unsuitable to lay the pipe in the Municipal Drainage Superintendent's or the Engineer's opinion, they may direct that the location of said trench be changed if it is possible to avoid unsound soil by doing so.

All excavation shall be made in compliance with the drawings and in such a manner and at such depths and widths as will give ample room for installing the pipe, the bracing, sheeting, or otherwise supporting the sides of the excavation and for the pumping of ground water if encountered. The Contractor shall be fully responsible for the safety of all its staff and equipment and shall completely conform to the provisions of the "Construction Safety Act" and "Regulations for Construction Projects".

The bottoms of the trenches shall be carefully excavated and trimmed to the elevation and shape of the bottom of the pipe. The bottom of each trench shall be recessed to receive the pipe in order to allow the pipe to be uniformly supported on firm undisturbed earth for its' entire length. Corrections in depth of excavation caused by the Contractor excavating to an extent greater than that required for the elevation of the pipe shall be made by bedding the pipe with granular material 20mm (3/4") clear

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

stone placed at the time that the pipes are installed, at the Contractor's expense.

The trenches shall be excavated to the depths given by the Engineer and only as far in advance of the pipe laying as permitted by the said Engineer or the Municipal Drainage Superintendent.

If any part of the bottom of the trench is found to be unsound or in any way unsuitable in the Municipal Drainage Superintendent's or the Engineer's opinion to lay drain pipe, the Contractor shall remove as much material as required and shall replace same with sufficient approved granular material 20mm (3/4") clear stone to form a sound bed for the pipe. The Contractor shall be paid an extra for such additional excavation and for supplying and placing of the granular material in place of unsound soil as per the unit price established for same in the Form of Tender.

No extras will be allowed for excavating any hardpan, boulders, rocks, ice or other obstacles found in the excavation or in the line of the trench or for any pumping or baling of water required in the execution of the work. The trench shall be drained or pumped in order to avoid the necessity of making joints under water. The trench shall also be drained to avoid any possibility of ground water entering the pipe in the trench until the installation has been successfully completed.

The Contractor shall lay the drain pipe to the lines, levels, and grades as shown in the accompanying drawings or as laid out and established by the Engineer prior to the time of construction. The Contractor shall be held responsible for said lines, levels and grades of the drain pipe and if the Engineer determines that the Contractor has not satisfactorily adhered to such lines, levels and grades, they may direct the Contractor to take up and re-lay any portion of the drain which does not conform to such lines, levels and grades.

A laser beam shall be used to maintain line and grade. The Contractor shall have a qualified operator to set up and operate the equipment.

The Contractor shall be responsible for the safe and proper handling of the pipe and shall inspect all pipes to ensure that no cracks, chips or defects exist in the pipe prior to placing the pipe in the drain line. If the Contractor permits damaged pipe or materials to be installed in the drain, it shall be responsible for the removal and replacement of same at its own expense should the Engineer require such removal and replacement.

If the drain pipe is laid in freezing weather, the Contractor shall take all the necessary precautions to prevent damage to the pipe or to any of the materials used in the construction of the work. In addition, the Contractor shall take care that no frozen ground or backfill is placed in the trench backfilling adjacent to the drain pipe.

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

All drain pipes and the various other materials used in the placing of said pipe shall be installed in strict compliance with the manufacturer's recommendations.

The Contractor shall also be required as part of the drain pipe installation to satisfactorily connect all intercepted tiles or pipes that are not septic into the new covered drains. Septic connections shall not be connected to the storm drainage system and shall be dealt with by the Municipal Building Department and Regulatory Authorities. When intercepted tiles or pipes are to be connected, the Contractor will be required to neatly cut the pipe walls with either a concrete saw, hole saw or welding torch where applicable, and connect the existing tiles or pipes to the new covered drain with a mortar joint or where possible, a plastic connecting adaptor. The Contractor shall provide all of the above equipment and materials required to connect all intercepted tiles or pipes at no extra cost to the project, and all of same shall be performed to the full satisfaction of the Municipal Drainage Superintendent or Engineer and shall not be backfilled until it is inspected by them. All cut steel edges shall be touched up with a zinc rich coating painted over the entire area where galvanizing has been damaged.

Backfill for the drain pipe shall comprise of Granular "B" and Granular "A" materials meeting Ontario Provincial Standard Specification requirements. Said granular backfill shall be carefully placed and compacted around the haunches of the pipe and overtop of the pipe to a minimum of 95% Standard Proctor Density. Where the Contractor carries out work across existing driveways or roadways, the Contractor shall be required to backfill the trench with the above noted materials compacted to 100% of Standard Proctor Density to within 400mm (16") of the finished road surface or driveway. The top 400mm (16") of the trench shall be completely backfilled for the full width of the drain trench with 0-16mm (5/8") granular material M.T.O. Type "A" (crushed limestone) which shall be satisfactorily compacted into place to a Minimum Standard Proctor Density of 100%. The Contractor shall at all times be very careful when performing its backfilling and compaction operations so that no damage is caused to the covered drain. To ensure that no damage is caused to the proposed drain pipe, alternative methods of achieving the required backfill compaction shall be submitted to the Engineer or the Municipal Drainage Superintendent for their approval prior to the commencement of this work.

At the locations where catch water basins and swale outlet pipes are being installed, the Contractor shall provide and place fill, if necessary, and fine grade all adjacent ground in order to ensure that all adjacent areas are properly graded to said collector basin or pipe, and the same shall be performed to the full satisfaction of the Municipal Drainage Superintendent and Engineer. In carrying out its excavation operations, the Contractor shall salvage any existing topsoil materials that are available and re-utilize same in carrying out the restoration works as further specified in these documents.

At each of the covered drain swale outlet pipes, the Contractor shall provide a hinged outlet grating. The grating shall be

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

fabricated of minimum 12mm (1/2") diameter vertical bars spaced approximately 60mm (2.5") on centre. A minimum of 2 horizontal bars shall be provided and the grating shall be wired closed.

All asphalt driveways and roadways shall be restored by saw cutting the limits of the drain trench to a clean edge, and the top of the trench shall be filled, with minimum 50mm or to the thickness of the existing asphalt pavement, with HL-3 hot mix asphalt compacted to a minimum of 92% to 96% of maximum relative density in accordance with O.P.S. 310. All asphalt areas shall be restored to match the existing thickness if greater than 50mm and shall be compacted in maximum 50mm lifts.

If during the course of the work any asphalt road or driveway edges are damaged, these broken areas shall be removed and the road or driveway edges restored by placement of a minimum of 50mm thick, or to match the existing thickness, of well compacted HL-3 asphalt, as provided for in the tender form. All removed material shall be hauled away and disposed of by the Contractor at its expense. The extent of the repairs shall be established in consultation with the Municipal Drainage Superintendent, the Road Authority, and the Engineer and the repairs shall be completed to their full satisfaction.

The alignment of the covered drain throughout shall be to the full satisfaction of the Municipal Drainage Superintendent and Engineer and as shown on the plans. The whole of the work shall be done in a neat, thorough, and workmanlike manner to the full satisfaction of the Municipal Drainage Superintendent and Engineer.

VI. DISPOSAL OF FILL

It is intended for this project that any excess fill excavated along the course of the drainage work shall be hauled away and disposed of by the Contractor to a site to be obtained by it at its own expense unless otherwise specified.

In all cases, the disposal of any trucked material shall be the full responsibility of the Contractor, and any work at the disposal site shall be established between the Contractor and the site owner. The Contractor shall ensure that any permits required for fill disposal are obtained from the appropriate authority. The Contractor will be responsible for keeping all private and public roadways free and clear of mud and debris resulting from its use of same for access and hauling purposes.

VII. TOPSOIL, SEEDING AND MULCHING

As part of the project, all disturbed and newly filled areas shall be covered with approximately 50mm of topsoil, fine graded. Across the front of residential properties, the lawn areas shall be restored by the installation of good quality OSECO Lawn Seed Mixture Canada No. 1 or equal. All grass boulevard areas and swale banks shall be restored utilizing a seed and mulch mixture and shall be thoroughly restored to their pre-construction conditions, or better. The placing and grading of all topsoil

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

shall be carefully and meticulously carried out according to Ontario Provincial Standard Specifications, Form 570, dated November 2007, or as subsequently amended or as amended by these Specifications.

The Contractor is advised that control of erosion and sedimentation is a major requirement of this project. The Contractor will be expected to implement control measures, including but not limited to, utilizing silt fences and straw bales in the swale bottoms to reduce the amount of sediment escaping downstream into the receiving water bodies. Said work shall be carried out in general conformance with Ontario Provincial Standard Specifications, Form 577, dated November 2006, or as subsequently amended or as amended by these Specifications. As an integral part of the sedimentation control, the Contractor will be required to carry out seeding and mulching on a timely basis so that no portion of the excavated drain or fill placed is left exposed for an extended length of time.

The newly excavated side slopes and fill areas shall be seeded and mulched in accordance with the Ministry of Transportation Specifications for same. The Contractor shall be required, as part of the preparation for seeding and mulching, to spread the scavenged topsoil and harrow the side slopes and fill areas and to include said cost in its lump sum price bid. Where there is a shortage of topsoil, the Contractor shall provide good, black, loamy topsoil at no extra cost to the project.

The seeding and mulching operations shall be carried out according to Ontario Provincial Standard Specifications, Form 572, dated November 2003, or as subsequently amended or as amended by these Specifications.

As part of the seeding and mulching operation, the Contractor will be required to provide either a hydraulic mulch mix or a spread straw with adhesive binder mulch, in accordance with O.P.S.S. 1103.05.03 dated November 2007, or as subsequently amended to ensure that the grass seed will be protected during germination and provide a thick uniform cover to protect against erosion, where necessary. The Contractor shall provide watering of seed areas in accordance with O.P.S.S. requirements, and as part of the work, the Contractor shall provide a full one (1) year guarantee on all seeding and mulching work, and will be required to repair all areas that erode or where the grass cover fails to catch. All work shall be meticulously done and completed in a good and workmanlike manner to the complete satisfaction of the Municipal Drainage Superintendent and the Engineer.

VIII. GENERAL EROSION PROTECTION

Where shown on the plans or as further directed by the Municipal Drainage Superintendent or the Engineer, the Contractor will be required to place general erosion protection comprising of rock on filter cloth as shown and detailed on the plans and as specified herein.

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

The general erosion protection is to be embedded into the side slopes of the drain a minimum of 305mm (12") and same shall be underlaid in all cases with a non-woven synthetic filter mat for all of the portion of the rock protection being installed. The synthetic filter mat shall not only be layed along the flat portions of the quarried limestone protection, but is also to be contoured to the exterior limits of same between the quarried limestone and the unprotected drain side slope. The Contractor, in placing the general erosion protection, shall carefully tamp the quarried limestone pieces into place with the use of a shovel bucket so that said protection, when completed, shall be consistent, uniform, and tightly layed, and in no instance shall the quarried limestone pieces protrude beyond the exterior contour of the unprotected drain side slopes along either side of the protection. The synthetic filter mat to be used shall be non-woven geotextile Type GMN160 conforming to O.P.S.S. 1860 Class I, as available from Armtec Construction Products. The quarried limestone to be utilized for the installation of the general erosion protection shall be graded in size from a nominal minimum of 100mm (4") to a nominal maximum of 200mm (8") in diameter. Said quarried limestone is available from Amherst Quarries Ltd. in Amherstburg, Ontario or equal. All work shall be carried out to the full satisfaction of the Municipal Drainage Superintendent and the Engineer.

IX. GENERAL CONDITIONS

- a) The Municipal Drainage Superintendent or Consulting Engineer shall have authority to carry out minor changes to the work where such changes do not lessen the efficiency of the work.
- b) The Contractor shall satisfy itself as to the exact location, nature and extent of any existing structure, utility or other object which it may encounter during the course of the work. The Contractor shall indemnify and save harmless the Municipality of Leamington and the Consulting Engineer and its' representatives for any damages which it may cause or sustain during the progress of the work. It shall not hold the Municipality of Leamington or the Consulting Engineer liable for any legal action arising out of any claims brought about by such damage caused by it.
- c) The Contractor shall provide a sufficient number of layout stakes and grade points so that the Drainage Superintendent and Consulting Engineer can review same and check that the work will generally conform with the design and project intent.
- d) The Contractor will be responsible for any damage caused by it to any portion of the Municipal road system, especially to the travelled portion. When excavation work is being carried out and the excavation equipment is placed on the travelled portion of the road, the travelled portion shall be protected by having the excavation equipment placed on satisfactory timber planks or timber pads. If any part of the travelled portion of the road is damaged by the Contractor, the Municipality shall have the right to have the necessary

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

repair work done by its' employees and the cost of all labour and materials used to carry out the repair work shall be deducted from the Contractor's contract and credited to the Municipality. The Contractor, upon completing the works, shall clean all debris and junk, etc., from the roadside of the drain, and leave the site in a neat and workmanlike manner. The Contractor shall be responsible for keeping all public roadways utilized for hauling materials free and clear of mud and debris.

- e) The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and latest amendments thereto. If traffic control is required on this project, signing is to comply with the M.T.O. Manual of Uniform Traffic Control Devices (MUTCD) for Roadway Work Operations.
- f) Following the completion of the work, the Contractor is to trim up any broken or damaged limbs on trees which are to remain standing, and it shall dispose of said branches along with other brush, thus leaving the trees in a neat and tidy condition.
- g) The whole of the work shall be satisfactorily cleaned up, and during the course of the construction, no work shall be left in any untidy or incomplete state before subsequent portions are undertaken.
- h) All driveways, laneways and access bridges, or any other means of access on to the job site shall be fully restored to their former condition at the Contractor's expense. Before authorizing Final Payment, the Municipal Drainage Superintendent and the Consulting Engineer shall inspect the work in order to be sure that the proper restoration has been performed. In the event that the Contractor fails to satisfactorily clean up any portion of these accesses, the Consulting Engineer shall order such cleanup to be carried out by others and the cost of same be deducted from any monies owing to the Contractor.
- i) The Contractor will be required to submit to the Municipality, a Certificate of Good Standing from the Workplace Safety and Insurance Board prior to the commencement of the work and the Contractor will be required to submit to the Municipality, a Certificate of Clearance for the project from the Workplace Safety and Insurance Board before Final Payment is made to the Contractor.
- j) The Contractor shall furnish a Performance and Maintenance Bond along with a separate Labour and Material Payment Bond within ten (10) days after notification of the execution of the Agreement by the Owner. One copy of said bonds shall be bound into each of the executed sets of the Contract. Each Performance and Maintenance Bond and Labour and Material Payment Bond shall be in the amount of 100% of the total Tender Price. All Bonds shall be executed under corporate seal by the Contractor and a surety company, authorized by

Specifications - Enns Drain - Highway 77 Branch
(Philips Engineering Network 8,
Part of Lot 6 & Lot 7, Concession 6)
Municipality of Leamington - D-07-028C

law to carry out business in the Province of Ontario. The Bonds shall be acceptable to the Owner in every way and shall guarantee faithful performance of the contract during the period of the contract, including the period of guaranteed maintenance which will be in effect for twelve (12) months after substantial completion of the works.

The Tenderer shall include the cost of bonds in the unit price of the Tender items as no additional payment will be made in this regard.

- k) The Contractor shall be required, as part of this Contract, to provide Comprehensive Liability Insurance coverage for not less than \$2,000,000.00 on this project, and shall name the Ministry of Transportation, the Municipality of Leamington and its' officials, and the Consulting Engineer and its staff as additional insured under the policy. The Contractor must submit a copy of this policy to both the Municipal Clerk and the Consulting Engineer prior to the commencement of work.
- l) Monthly progress orders for payment shall be furnished the Contractor by the Municipal Drainage Superintendent. Said orders shall be for not more than 90% of the value of the work done and the materials furnished on the site. The paying of the full 90% does not imply that any portion of the work has been accepted. The remaining 10% will be paid 45 days after the final acceptance and completion of the work and payment shall not be authorized until the Contractor provides the following:
 - i) a Certificate of Clearance for the project from the Workplace Safety and Insurance Board
 - ii) proof of advertising
 - iii) a Statutory Declaration, in a form satisfactory to the Consulting Engineer and the Municipality, that all liabilities incurred by the Contractor and its Sub-Contractors in carrying out the Contract have been discharged and that all liens in respect of the Contract and Sub-Contracts thereunder have expired or have been satisfied, discharged or provided for by payment into Court.

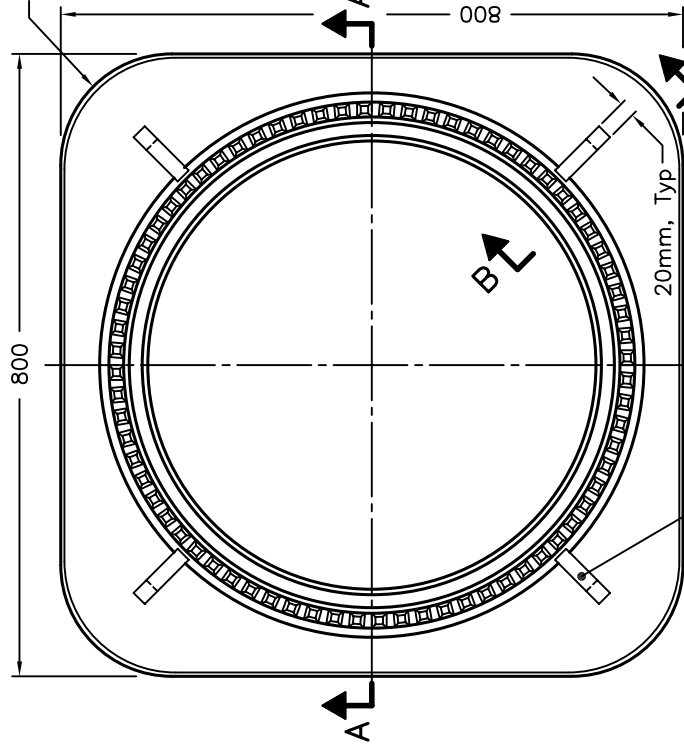
The Contractor shall satisfy the Consulting Engineer or Municipality that there are no liens or claims against the work and that all of the requirements as per the Construction Lien Act, 1983 and its' subsequent amendments have been adhered to by the Contractor.

- m) In the event that the Specifications, Information to Tenderers, or the Form of Agreement do not apply to a specific condition or circumstance with respect to this project, the applicable section or sections from the Canadian Construction Documents Committee CCDC2 shall govern and be used to establish the requirements of the work.

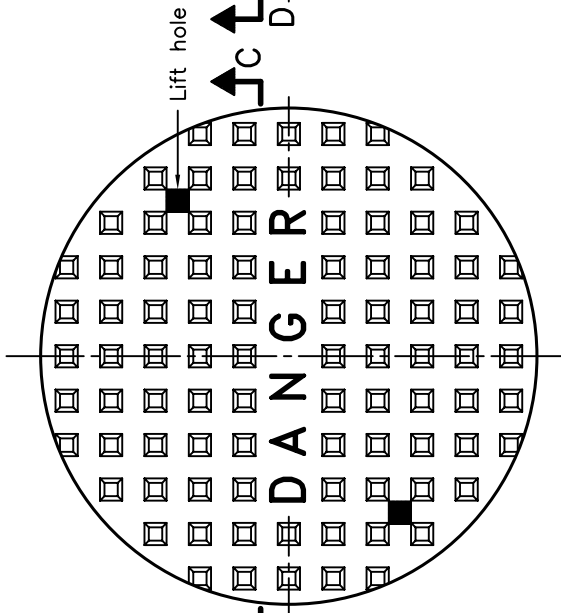
APPENDIX "A"

APPENDIX "B"

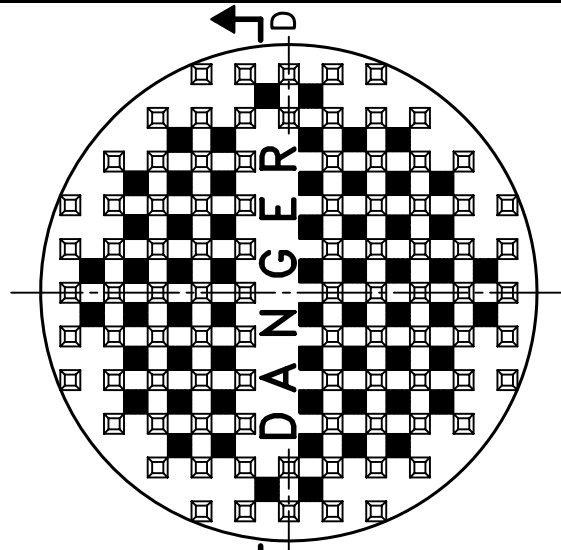
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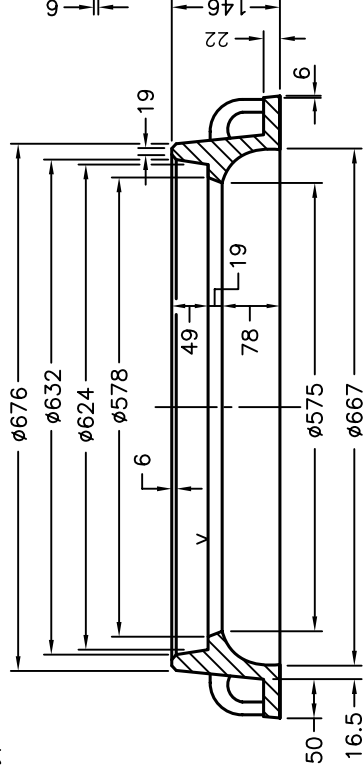
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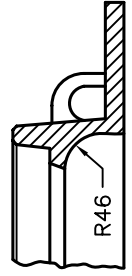
**TYPE A
CLOSED COVER**



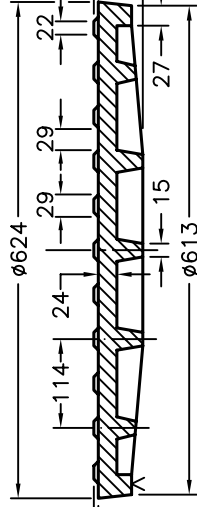
**TYPE B
OPEN COVER**



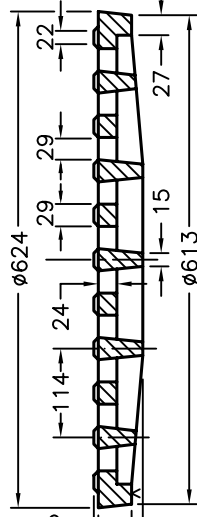
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

NOTES:

- A Covers shall be Type A or Type B as specified.
- B All dimensions are in millimetres unless otherwise shown.

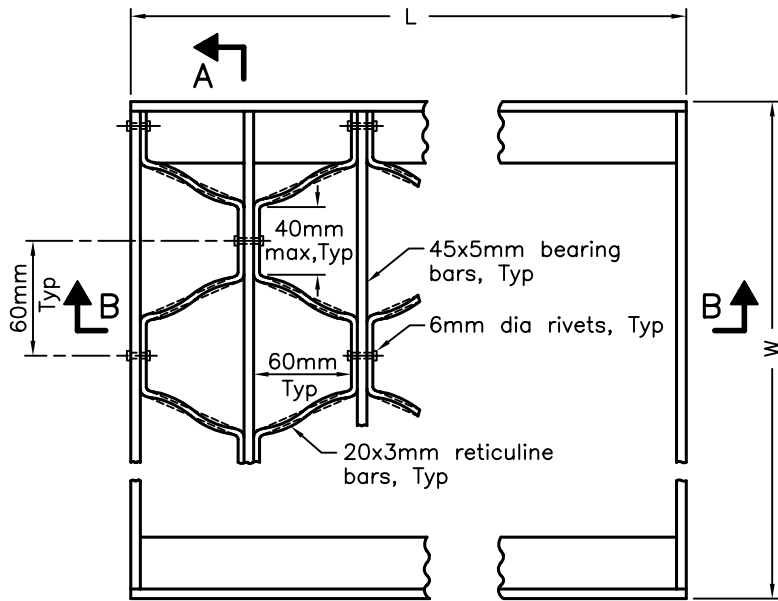
ONTARIO PROVINCIAL STANDARD DRAWING

**CAST IRON, SQUARE FRAME WITH
CIRCULAR CLOSED OR OPEN COVER
FOR MAINTENANCE HOLES**

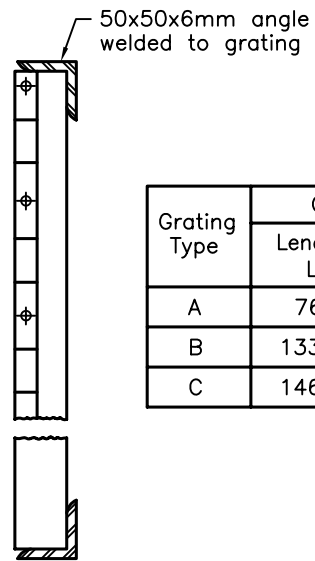
Nov 2007 Rev 2



OPSD 401.010



PLAN OF GRATE

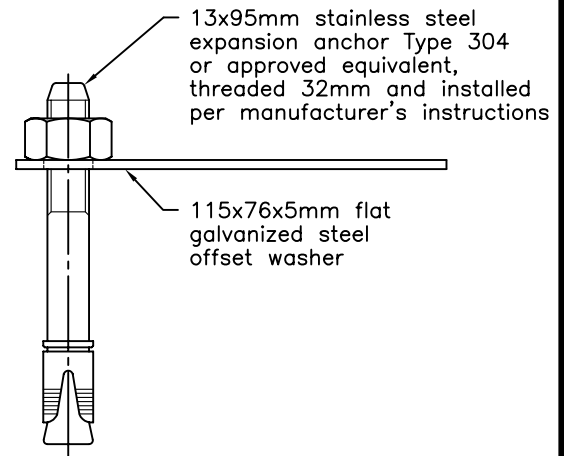


SECTION A-A

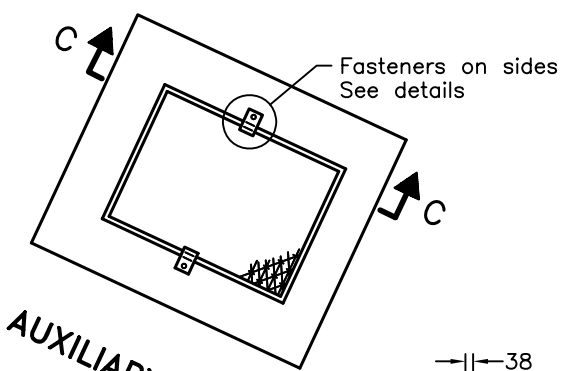
Grating Type	Grating Size	
	Length L	Width W
A	762	768
B	1338	768
C	1465	768



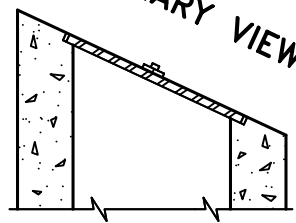
SECTION B-B



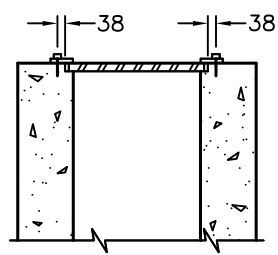
FASTENER DETAIL



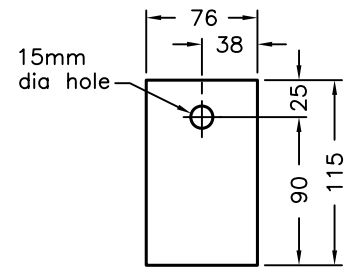
AUXILIARY VIEW



SECTION C-C



FASTENER EMBEDMENT DETAIL



OFFSET WASHER DETAIL

NOTES:

- A Fastener to be inserted to maintain minimum concrete cover requirements.
- B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2007 Rev 1

**GALVANIZED STEEL
HONEYCOMB GRATING
FOR DITCH INLETS**



OPSD 403.010

Tapered top
See alternatives D
and E

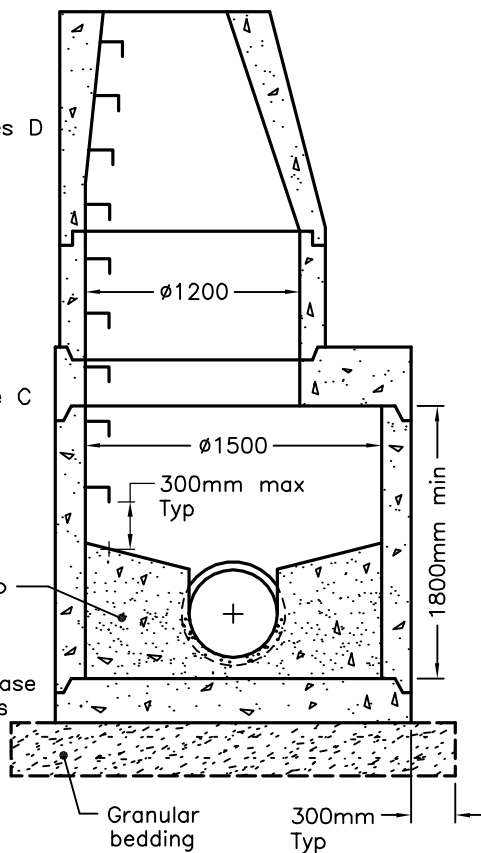
Riser sections
as required

Transition slab
See alternative C

Riser sections
as required

Bench or sump
as specified
Note 1

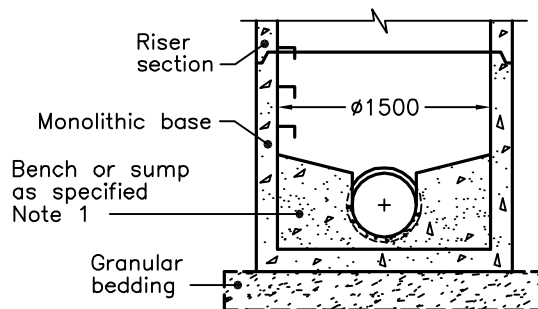
Precast slab base
See alternatives
A and B



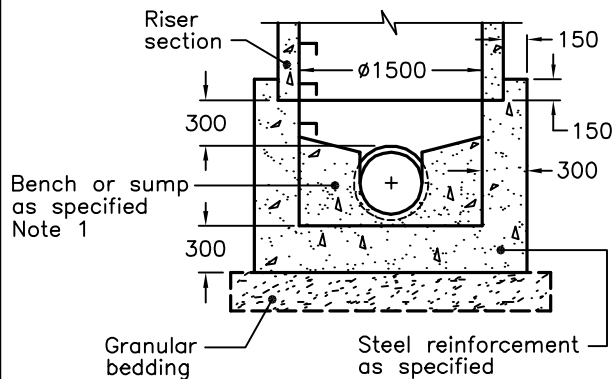
NOTES:

- 1 For sump detail see OPSD 701.010.
- A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
- B Precast concrete components shall be according to OPSD 701.030, 701.031, 701.040, 701.041, 703.011, 703.021, and 706.010.
- C Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020 or 404.021.
- D Pipe support shall be according to OPSD 708.020.
- E For benching and pipe opening details, see OPSD 701.021.
- F For adjustment unit and frame installation, see OPSD 704.010.
- G All dimensions are nominal.
- H All dimensions are in millimetres unless otherwise shown.

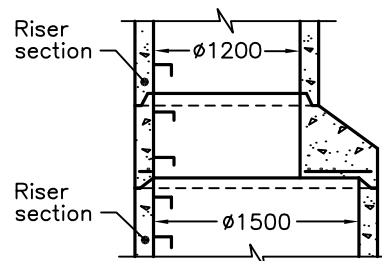
ALTERNATIVES



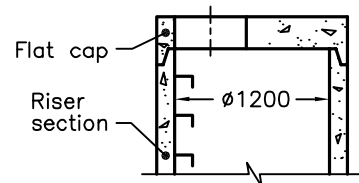
A PRECAST MONOLITHIC BASE



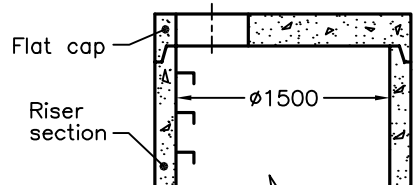
B CAST-IN-PLACE BASE



C TAPERED TRANSITION SLAB



D 1200mm PRECAST FLAT CAP



E 1500mm PRECAST FLAT CAP

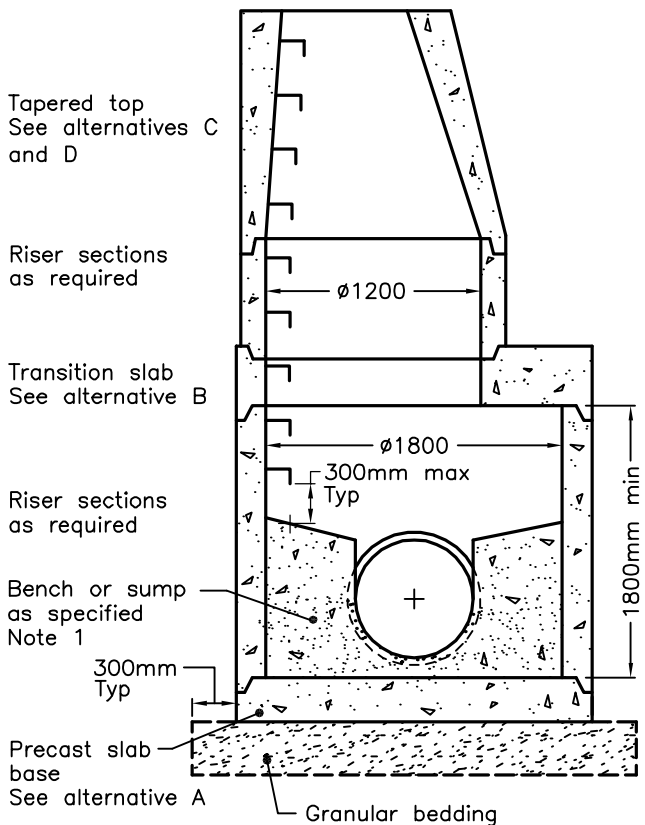
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Nov 2009 | Rev | 4

**PRECAST CONCRETE
MAINTENANCE HOLE
1500mm DIAMETER**



OPSD 701.011



Tapered top
See alternatives C
and D

Riser sections
as required

Transition slab
See alternative B

Riser sections
as required

Bench or sump
as specified
Note 1

300mm
Typ

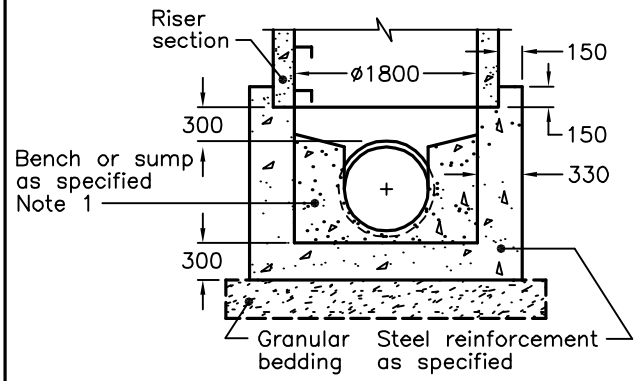
Precast slab
base
See alternative A

Granular bedding

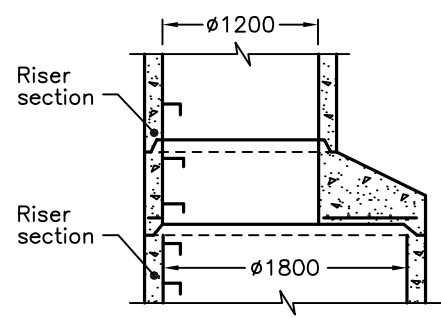
NOTES:

- 1 For sump detail see OPSD 701.010.
- A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
- B Precast concrete components shall be according to OPSD 701.030, 701.031, 701.050, 701.051, 703.012, 703.022, and 706.020.
- C Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020 or 404.022.
- D Pipe support shall be according to OPSD 708.020.
- E For benching and pipe opening details, see OPSD 701.021.
- F For adjustment unit and frame installation, see OPSD 704.010.
- G All dimensions are nominal.
- H All dimensions are in millimetres unless otherwise shown.

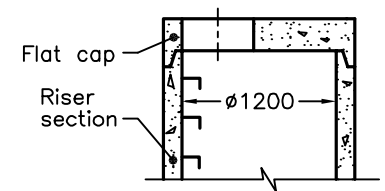
ALTERNATIVES



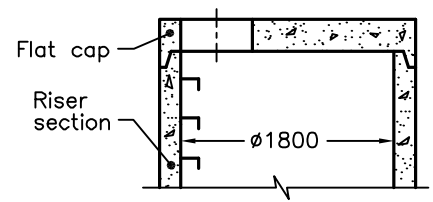
A CAST-IN-PLACE BASE



B TAPERED TRANSITION SLAB



C 1200mm PRECAST FLAT CAP



D 1800mm PRECAST FLAT CAP

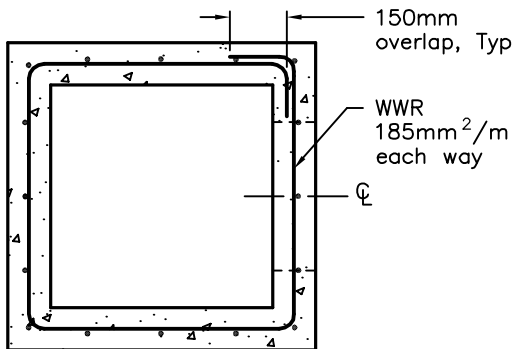
ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2009 Rev 4

**PRECAST CONCRETE
MAINTENANCE HOLE
1800mm DIAMETER**



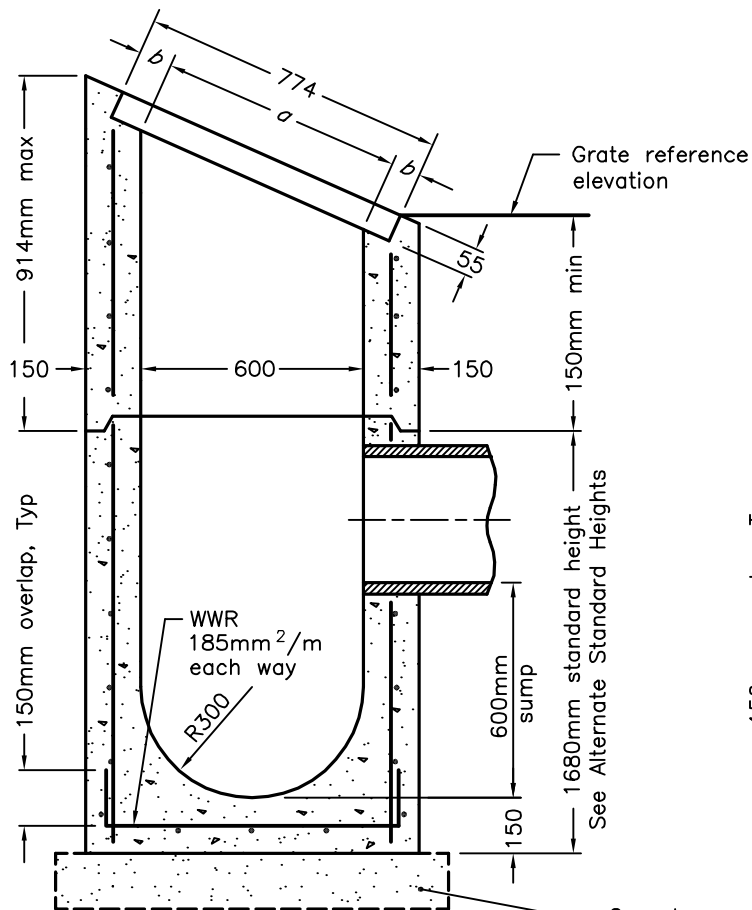
OPSD 701.012



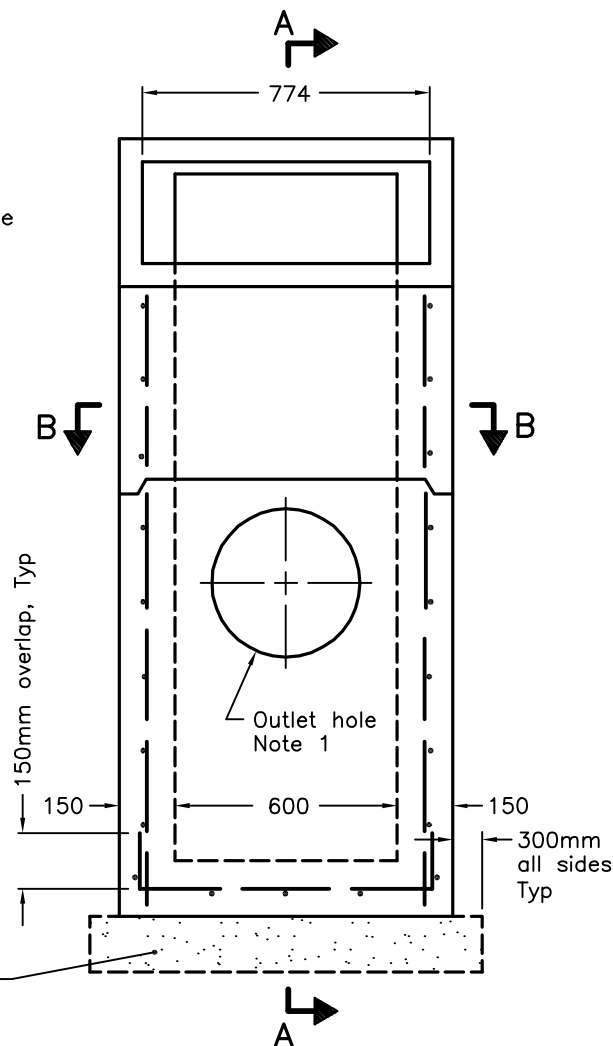
SECTION B-B

Alternate Standard Heights	
Alternate	Dimension
A	1980
B	1520
C	1380

Opening Dimensions			
Grate		a	b
Type	Slope		
A	2H:1V	670	52
	3H:1V	632	71
	4H:1V	618	78
	6H:1V	608	83
	HOR	600	87



SECTION A-A



FRONT VIEW

NOTES:

- 1 Outlet hole size 525mm maximum diameter, location as required.
- A Where inlet is placed across ditch and is accessible to vehicular traffic, grating slope shall be 6H:1V or flatter.
- B Center reinforcing in wall and slab ± 25 mm.
- C Granular backfill shall be placed to a minimum thickness of 300mm all around the ditch inlet.
- D Grating shall be according to OPSD 403.010.
- E Pipe support shall be according to OPSD 708.020.
- F All dimensions are nominal.
- G All dimensions are in millimetres unless otherwise shown.

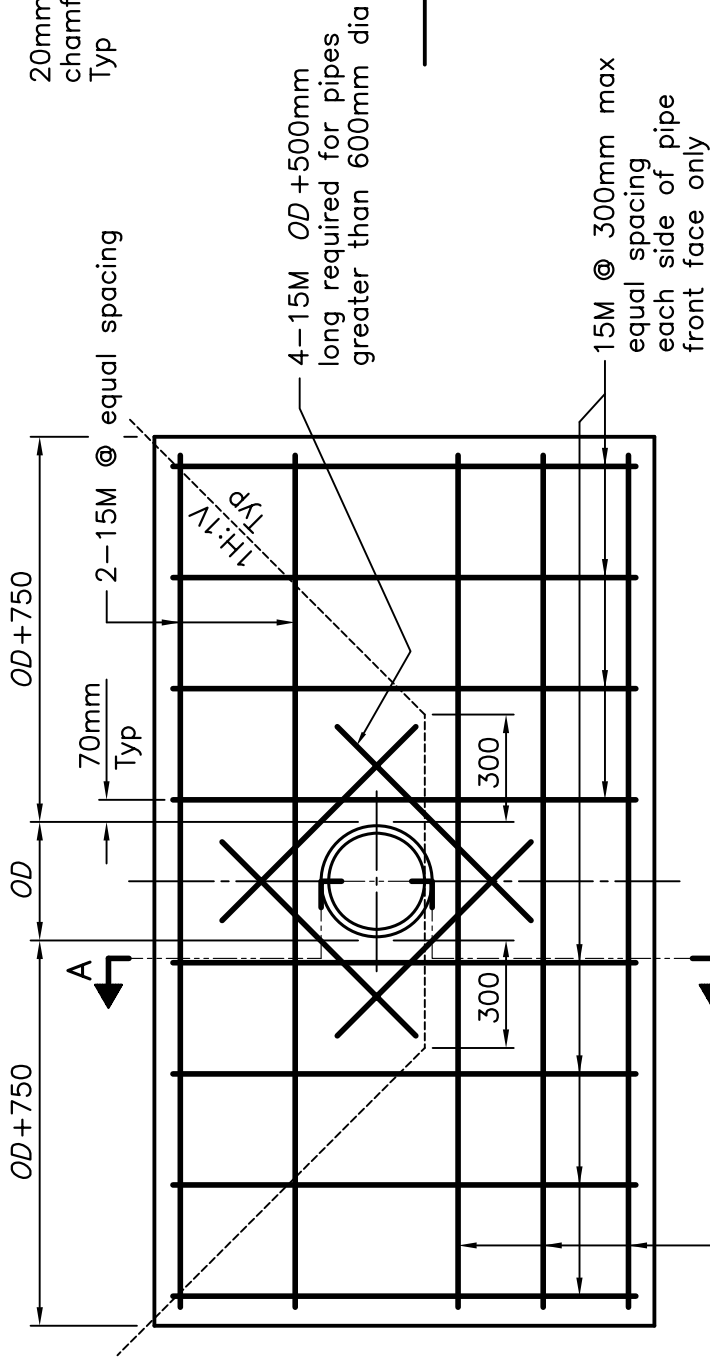
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Nov 2009 | Rev | 2

PRECAST CONCRETE DITCH INLET
600 x 600mm



OPSD 705.030



FRONT ELEVATION

SECTION A-A

LEGEND:

OD - Outside diameter of pipe

NOTES:

- A This OPSD to be read in conjunction with OPSD 3940.150.
- B If a steel grate is required, refer to OPSD 804.05.
- C Class of concrete: 30MPa.
- D Cover to reinforcing bars 75mm ± 20mm.
- E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2006 Rev 1



CONCRETE HEADWALL
FOR PIPE LESS THAN 900mm DIAMETER

OPSD 804.030

APPENDIX 'C'

Ministry of Transportation Ontario Specifications Forming Part of Contract No. 2008-3007

NOTE:

This document is a considerable size and will not be included with the report being distributed to all affected ratepayers. A copy of these Specifications will be available for viewing at the Municipal office for those interested.