Schedule A to By-law No. 2016-68

Township of Oro-Medonte
Development Engineering
Policies, Process
and
Design Standards

Prepared by:
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Manager, Development Engineering

Issued: April, 2016
Revised: September, 2019
Revised: May, 2023

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REVISION INFORMATION SHEET – 1 of 2

The following table indicates Substantial Revisions including additions, deletions and modifications to this design manual subsequent to the As-Revised Issuance of September 2019. The Revisions Found Below Are Those of a Substantial Nature or those occurring with regularity (e.g. Names and Titles) .

Other Changes MAY Be Found Within this Document. A Thorough Review of This Version Shall Be Undertaken Prior to the Commencement of Design and Again Prior to Submission(s) / Re-Submission(s) to Ensure Compliance with Township Standards.

Revisions to this manual are subject to the approval of the Director of Development Services.

Revision No.	Date	Revision Details	Initials
1	05/23	Various Locations / Standard Drawings – Sidewalks are to be 1.5m in width	DJS
2	05/23	Various Locations / Standard Drawings “J” Clips are to be used to secure Tracer Wire to watermain	DJS
3	05/23	Various Locations – Corrections to Township Department Names	DJS
4	05/23	Various Locations – Corrections to Township Staff Titles for Signing Authority	DJS
5	05/23	Updated Township Development Area Mapping	DJS
6	05/23	ALL Submissions are to be in Electronic Format and UTM Coordinate Referenced	DJS
7	05/23	Water Services (Residential) are to be either 19mm or 25mm Polyethylene complete with tracer wire. (Copper services are NOT accepted)	DJS
8	05/23	Various Locations – Ontario Ministry names and Utility Providers corporate names updated	DJS
9	05/23	2.1.2 – Sales Office and / or Site Trailer Specific items required	DJS
10	05/23	2.5.1 – Requirements for Pre-Construction Meeting Description of works required by the Developer	DJS
11	05/23	2.5.5 – Winterizing of Subdivisions Description of works required by the Developer	DJS
12	05/23	2.5.11 – Existing Infrastructure All costs shall be solely at the Developer’s expense.	DJS
13	05/23	2.7 – Substantial Completion, Initial Acceptance and Maintenance, and Final Acceptance and Assumption 1. Substantial Completion for Underground Servicing and Aboveground Servicing remain as independent actions. 2. The 2 Year Maintenance Period **for ALL works** begins with the Initial Acceptance and Maintenance. 3. Final Acceptance and Assumption shall be **for ALL works** at the end of the prescribed 2 Year Maintenance Period.	DJS

REVISION INFORMATION SHEET – 2 of 2

14	05/23	3.4.2 – Overall Grading Plans ALL Retaining Walls of 1.0m or higher shall be Certified by a Professional Engineer	DJS
15	05/23	3.4.3 – Winterizing of Subdivisions Description of works required by the Developer	DJS
16	05/23	3.5.10 – Cul-De-Sac Radii Adjusted Radii to conform with the County of Simcoe Waste Collection Vehicle Requirements	DJS
17	05/23	3.5.12 – Driveway Entrances Driveway Entrance Culverts shall be Ultra Rib, Smooth Wall, HDPE Plastic. Driveway Headwalls shall not be permitted, unless otherwise approved by the Township	DJS
18	05/23	3.7.8.3, 3.7.8.4 and 3.7.9.6 – Stormwater Management Minimum Dimensions of Storm Manholes – 1500mm and Lift Ring / height adjustment adapter acceptable materials.	DJS
19	05/23	3.9.2.21 and 3.9.2.22 – Sanitary Collection Sewers Minimum Dimensions of Storm Manholes – 1500mm and Lift height adjustment adapter acceptable materials.	DJS

The Corporation of the Township of Oro-Medonte

By-law No. 2016-068

A By-law to Adopt Development Engineering Policies, Process, and Design Standards

Whereas the *Municipal Act 2001, S.O. 2001 C.25, Section 224*, as amended, states that it is the role of Council to ensure that administrative practices and procedures are in place to implement the decisions of Council;

And Whereas the Council of the Corporation of the Township of Oro-Medonte deems it desirable to adopt Development Engineering Policies, Process, and Design Standards;

Now Therefore the Council of the Township of Oro-Medonte hereby enacts as follows:

1. That the Development Engineering Policies, Process, and Design Standards attached hereto as Schedule "A' form part of this By-law and shall be the Development Engineering Standards for the Township of Oro-Medonte;

2. That Township staff is authorized to revise the Development Engineering Policies, Process, and Design Standards as deemed appropriate. Such revisions shall be documented accordingly, and the revised document shall be publicly available;

3. That By-law 2013-178 is hereby repealed in its entirety;

4. This by-law shall take effect on the final passing thereof.

By-law read a First, Second and Third time, and Passed this 27th day of *April, 2016.

The Corporation of the Township of Oro-Medonte

(SIGNED)
Mayor, H.S. Hughes

(SIGNED)
Clerk, J. Douglas Irwin

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TOWNSHIP OF ORO-MEDONTE

DEVELOPMENT ENGINEERING POLICIES, PROCESS and DESIGN STANDARDS

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SECTION 1 – GENERAL INFORMATION

Introduction and Purpose

The Township of Oro-Medonte Development Engineering Policies, Process and Standards presented here are intended to provide uniform planning and engineering design guidelines for the development and servicing of lands within the Township.

The Township Standards are to be read in conjunction with the latest editions of the Ontario Provincial Standard Specifications (OPSS), the Ontario Provincial Standard Drawings (OPSD), MECP Design Standards (as amended), AWWA Design Standards (as amended),the Township of Oro-Medonte Standard Subdivision Agreement, Pre-Servicing Agreement, Model Home Agreement, Residential Lot Grading, and Industrial / Commercial / Institutional Site Plan Guidelines. In the case of a discrepancy the more stringent standard shall prevail.

The information contained herein shall be considered and implemented in the preparation of the Site Plan Agreements, Subdivision Agreements, Condominium Agreements and Building Permits as may be applicable.

It is the Township's objective to become a Barrier Free and Age Friendly Community and to achieve the highest level of environmental stewardship in the development of roads and services and shall ensure they are constructed in compliance with the requirements contained within these Standards.

Innovative technological changes that improve or maintain the quality of the design, to increase environmental protection, accessibility, or a life cycle cost basis may be considered at the discretion of the Township.

All materials used shall be in accordance with the Ontario Provincial Standard Specifications (O.P.S.S.) for Roads and Municipal Services. The Manager of Development Engineering (or designate) shall approve any technical changes to those contained herein. Any proposed changes shall improve or maintain the quality of the design and shall not be ruled out if appropriate.

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The Township shall endeavour to respond within twenty (20) working days, after the receipt of a complete submission. Any submission that is of a poor quality or deemed to be incomplete may be returned or require more than twenty (20) working days to review.

Drawings for all submissions shall be in accordance with Township Standards and each submission shall be numbered (e.g. Submission 1, 2, or X) and include the date of submission.

The Township of Oro-Medonte reserves the right to amend the Township of Oro-Medonte Development Engineering Policies, Process and Standards where specific design criteria is mandated and/or amended and encompasses industry best management practices.

It is the applicant's responsibility to obtain and check with the Township of Oro-Medonte for changes or revisions to the Township of Oro-Medonte Development Engineering Policies, Process and Standards. Copies are available from the Township of Oro-Medonte from the web site at www.oro-medonte.ca.

Digital Copies of these Development Standards and the Drawings and Details are available in both PDF and AutoCAD Formats and are available from the Township of Oro-Medonte by contacting the Development Engineering Division.

NOTE: All submissions are to be submitted electronically in PDF Format and As-Constructed Drawings in both PDF and AutoCAD formats (unless otherwise stated) and by way of a Township accepted electronic submission method.

1.2 Abbreviations and Definitions

In this document the following definitions and abbreviations shall apply:

Aboveground Services include services to be constructed by the Developer pursuant to the terms of the Subdivision Agreement. These servicing works include (but are not limited to: base course asphalt, finished course asphalt, curbs, sidewalks, permanent signage, pavement markings, Canada Post community mail box sites, landscaping works and parkland development (as applicable).

AOLS shall mean the Association of Ontatrio Land Surveyors.

Average Annual Daily Traffic (AADT) shall mean a technical measurement of traffic volume on a road, in both directions. Conversion factors, which vary depending on time of year (season) and week, to extrapolate daily traffic counts into AADT.

AWWA shall mean the American Water Works Association.

CCTV shall mean Closed Circuit Television.

Certificate shall mean a document containing a statement certifying the completion and acceptance of an activity or service that has fulfilled the specified requirements.

Certificate of Final Acceptance and Assumption shall mean a Certificate issued by the Township, as approved by Township Council, upon the receipt of certification by the Developer's Consulting Engineer that **all** Municipal Services Works have been constructed in accordance with the approved plans and specifications and in accordance with good engineering practices. Confirmation by the Manager of Development Engineering that the services have been satisfactorily maintained by the Developer during the two (2) year maintenance period shall be required. Issuance of the said Certificate shall constitute Final Acceptance and Assumption of the services by the Township and a final Release of Securities.

Certificate of Initial Acceptance and Maintenance shall mean a Certificate issued by the Manager of Development Engineering confirming that **all** Municipal Service Works installed by the Developer under the provisions of the Subdivision Agreement have been substantially completed in accordance with the approved plans and specifications and in accordance with good engineering practices. Issuance of this Certificate shall begin the Minimum Two-Year (2 Year) Maintenance Period prior to Final Acceptance and Assumption of the services by the Township. Issuance of this Certificate shall allow the Developer to make application for a Securities Reduction.

Certificate of Substantial Completion shall mean a Certificate issued by the Manager of Development Engineering confirming that the Municipal Services installed by the Developer under the provisions of the Subdivision Agreement to a point of completion being the completion of storm drainage works (including culverts, storm sewers and detention pond), waterworks, sanitary works, underground electrical distribution system, energized streetlighting, natural gas distribution, telephone and cable television distribution, base course asphalt, and temporary signage. Issuance of this Certificate shall allow the Developer to make application for a Securities Reduction and allow for Building Permits to be issued.

Certified Arborist / Arborist shall mean an Arborist certified to practice by the ISAO.

Certified Engineering Technologist (**C.E.T.)** shall mean a Certified Engineering Technologist – as certified by OACETT.

Certified Technician (**C.Tech)** shall mean a Certified Technician – as certified by OACETT.

Chief Administrative Officer (C.A.O.) shall mean the C.A.O. for the Township of Oro-Medonte.

Chief Building Official (CBO) shall mean the Chief Building Official for the Township of Oro-Medonte.

Class shall mean the context of these services refers to the criteria for the Classification of Roadways (also referred to as the Classification of Highways).

Clerk shall mean the Clerk of the Township of Oro-Medonte.

Conditions shall mean the state in which the subject matter is found. The type of service indicates the condition being measured.

Contractor / General Contractor shall mean the firm of Contractors, the company or individual acting as the Contractor and having entered into a contract with the Developer / Owner to install the services.

Council shall mean the Council of the Township of Oro-Medonte.

County shall mean the County of Simcoe.

CSA shall mean the Canadian Standards Association.

Cul-de-sac shall mean dead-end road, with only one entrance / exit.

Day shall mean a calendar day, measured to the end of the following day.

Debris shall mean the scattered remains of something broken or destroyed or carelessly discarded garbage, refuse, trash, or litter.

Developer / Owner shall mean the person(s) entering into the subdivision / site plan agreement with the Corporation of the Township of Oro-Medonte.

Developer's Consulting Engineer shall mean a competent professional engineer or firm of engineers employed by the Developer which is skilled and experienced in Township work and land development projects, registered with Professional Engineers Ontario, and possessing a current Certificate of Authorization to practice professional engineering as required by the Professional Engineers Act.

Developer's Electrical Consultant shall mean a Professional Engineer – licensed to practice by the PEO and with a specific experience in the engineering of electrical distribution networks and streetlight photometric design and installation.

Developer's Geotechnical Consultant shall mean a Professional Engineer – licensed to practice by the PEO and with a specific experience in the engineering behavior of earth materials and other engineering disciplines that are concerned with construction occurring on the surface or within the ground.

DFO shall mean the Department of Fisheries and Oceans Canada.

Director of Development Services shall mean the Director or the designate Appointed to undertake those fuctions and responsibilities (eg. Acting Director, Manager of Development Engineering).

Director of Environmental Services shall mean the Director or the designate Appointed to undertake those fuctions and responsibilities (eg. Acting Director, Environmental Sysyems Manager, Supervisor of Environmental Services).

Director of Operations and Community Services shall mean the Director or the Designate appointed to undertake those fuctions and responsibilities (eg. Acting Director, Manager, Infrastructure and Capital Projects).

Dust shall mean particles in the atmosphere that come from various sources such as soil or particulate lifted by weather or construction activity.

Entrance permit shall mean an official document granting authorization to create an entrance access over the Township Right of Way onto private property.

Earth / Soil shall mean the native or naturally occurring selected soils.

Encroachment shall mean an obstacle inside a zone, area or right-of-way which may or may not be permitted by these definitions.

Engineered Fill shall mean material that is placed and compacted in accordance with approved design criteria in order to improve land for an intended use.

Fill shall mean the placement of native or naturally occurring selected earth / soils.

Final Acceptance and Assumption shall mean the acceptance and assumption of **all** works included in **Initial Acceptance and Maintenance** and any other works as required in the Subdivision Agreement:

Underground Services - storm drainage works (including culverts, storm sewers and detention pond), waterworks, sanitary works, underground electrical distribution system, energized streetlighting, natural gas distribution, telephone and cable television distribution, base course asphalt, and temporary signage.

and

Above Ground Services - finished course asphalt, curbs, sidewalks, permanent signage, pavement markings, Canada Post community mailbox sites, landscaping works and parkland development (as applicable).

Issuance of this Certificate shall allow the Developer to make application for a Securities Release.

Fire Chief shall mean the Chief of the Oro-Medonte Fire and Emergency Services or the Designate Appointed to undertake those fuctions and responsibilities (eg. Deputy Chief, Fire Prevention Officer).

Fire Department shall mean Oro-Medonte Fire and Emergency Services.

Guidelines shall mean a statement(s) or procedure(s) that aims to streamline particular processes according to a set routine or sound practice and supports the policies it (they) is established to augment.

Hard Surface shall mean a road surface, which is relatively hard in nature, by treatment with either a bonding agent or cement, which effectively prevents reshaping by conventional motor grader.

Highway shall mean any road open to the public, although it usually refers to a main, high-speed route. (Typically designated by name or by number)

Horizontal Clearance shall mean an obstruction free zone measured horizontally from the centre line of a road.

Improved Condition shall mean a condition being better than it was before, from the perspective of a typical user, **all** other effects being equal.

Infill Lot shall mean an empty lot between homes in an existing or newer subdivision or could be an available piece of land between older homes, or between existing buildings.

Initial Acceptance and Maintenance shall mean the acceptance of **all Underground and Aboveground Municipal Services Works** as required in the Subdivision Agreement up to and including the following (as applicable):

Underground Services - storm drainage works (including culverts, storm sewers and detention pond), waterworks, sanitary works, underground electrical distribution system, energized streetlighting, natural gas distribution, telephone, and cable television distribution, base course asphalt, and temporary signage.

AND

Above Ground Services - finished course asphalt, curbs, sidewalks, permanent signage, pavement markings, Canada Post community mail box sites, landscaping works and parkland development (as applicable).

Inspection shall mean the activity performed by a person authorized by and / or directed by the Township to investigate and report on the conditions of the construction of roads and services relevant to the nature of the development or contract being performed.

Inspector shall mean a person authorized by and / or directed by the Township to investigate and report on the conditions of the construction of roads and services relevant to the nature of the development or contract being performed.

ISAO shall mean the International Society of Arboriculture Ontario.

Landscape Architect shall mean a Landscape Architect certified to practice by the Ontario Association of Landscape Architects.

Lane shall mean the portion of the road designated for a single file of vehicles to travel over, in one direction. For roads where two-way traffic is permitted, the lane width is half the road width unless delineated otherwise by pavement marking.

Loose surface shall mean a road surface that is of a granular manufactured product (gravel) or naturally occurring soil, which can reasonably be shaped by a motor grader, and includes road surfaces under reconstruction.

LSRCA shall mean the Lake Simcoe Region Conservation Authority.

Maintenance Period shall mean the repair and maintenance of **all** the Municipal Services Works for which the **Certificate of Initial Acceptance and Maintenance** has been issued and for a **minimum** period of two (2) years from the date the Manager of Development Engineering issues the **Certificate of Initial Acceptance and Maintenance.**

Manager of Development Engineering shall mean the Manager or the designate Appointed to undertake those fuctions and responsibilities (eg. Acting Manager, Other Development Services Staff Member, or Township's Engineering Consultants).

Maximum shall mean the context of these services refers to the highest level of service set by the Township, which the roadway user can reasonably expect. In effect it is the minimum service.

Minimum shall mean the context of these services refers to the lowest level of service set by the Township, which the roadway user can reasonably expect. Sometimes maximum defines the minimum service.

MNRF shall mean the Ontario Ministry of Natural Resources and Forestry.

Model Home shall mean a house in a newly built development that is furnished and decorated to be shown to prospective buyers.

MECP shall mean the Ontario Ministry of the Environment, Conservation, and Parks.

M.T.O. shall mean the Ontario Ministry of Transportation.

Multi-lane shall mean a road where multiple lanes of vehicles travel in one direction. For roads where two-way traffic is permitted, the multiple lanes make up half the road width and are delineated by pavement markings.

Municipality shall mean any abutting / adjacent township, town or city not being the Township of Oro-Medonte.

Notice shall mean the formal notification of an effect or condition is deemed to have been given when received by an appropriate supervisor of the Township.

NVCA shall mean the Nottawasaga Valley Conservation Authority.

OACETT shall mean the Ontario Association of Certified Engineering Technicians and Technologists.

OALA shall mean the Ontario Association of Landscape Architects.

OBC shall mean the Ontario Building Code.

OHBDC shall mean the Ontario Highway Bridge Design Code.

OLS shall mean an Ontario Land Surveyor licensed to practice by the Association of Ontatio Land Surveyors.

One-way shall mean a uni-directional route where **all** lanes of traffic flow in a singular direction.

OPSD shall mean the Ontario Provincial Standard Drawings.

OPSS shall mean the Ontario Provincial Standard Specifications.

PEO shall mean the Association of Professional Engineers Ontario.

Permit shall mean an official document granting the authorization to undertake a specific activity.

Police shall mean the Ontario Provincial Police (O.P.P.).

Policy (Policies) shall mean the decisions of a formal nature made by the Township to enable, qualify and govern the mission of that authority. Policies are normally qualified as to scope and application. A policy may only be exempted or altered by the body that created it. Policy (Policies) are not be confused with operational procedures or quality standards.

Pre-Construction shall mean performing preliminary planning and engineering in order to define the project, identify potential issues, and analyze cost impacts used in planning a construction project before the actual construction begins.

Pre-Servicing shall mean **all** infrastructure and earth works undertaken on lands intended to be for a Resdiential or Industrial / Commercial / Instutional (I.C.I.) development, prior to the signing of a Subdivision Agreement or Site Plan Agreement.

Process (Processes) shall mean the series of actions that produce something or that lead to a particular result.

Professional Engineer (P.Eng) shall mean Professional Engineer – licensed to practice by the PEO and in the case of development engineering practice refers to civil engineering - the discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals, dams, and buildings.

Reasonable shall mean the level of service which the Township has established as an objective.

Response shall mean the action taken by the Township when informed of an effect or condition. Monitoring an effect or condition may constitute a response. A reasonable response takes into account the relevant services.

Retaining Wall shall mean a structure designed and constructed to resist the lateral pressure of soil, when there is a desired change in ground elevation that exceeds the angle of repose of the soil.

Right of Way (R.O.W.) shall mean the corridor of land reserved for the limits of municipal lands from property line to propertry line for the purposes of containing the carriage way (travelled road) and roadway improvements, Township services, **all** other infrastructure and those services under the jurisdiction of other authorities – for example but not limited to electrical, gas, phone, cable.

Road / Street shall mean the travelled road surface on a roadway assumed by a Township, but not including on-street parking or stopping zones. Every road / street has two names, really. Its individual name: e.g. "Abbey" and its type: e.g. "road". There are **all** types of roadways. In some places a "road" is a main route with "streets" branching off of it. There isn't actually a definitive reason as to why some routes are "streets" and others are "roads".

Roadside shall mean **all** the elements that make up the roadway within the jurisdiction of the Township, except for the road surface itself.

Roadway shall mean any road assumed by the Township, intended for vehicular traffic. It refers not only to the travelled road surface, but also to **all** services relevant to the road, within the right of way. (Roadway = road + roadside)

Road System shall mean a collection of roadways, typically of various classifications, owned by or under the direct control of a single authority.

Road Closure Permit shall mean an official document granting authorization to close and occupy a Township Road for the purposes of construction / repair or servicing.

Road Occupancy Permit shall mean an official document granting authorization to occupy / have access to a portion of a Township Road or Right of Way for the purposes of construction / repair or servicing.

Rural Settlement Area shall mean a more sparsely populated settlement that exists in the country, away from more densely populated urban centers and is typically not serviced by municipal water delivery and / or municipal sewage collection.

Safe Conditions shall mean the general term identifying the concept of mitigating bodily injury or death of persons, or direct damage (beyond wear and tear) to property or contents.

Sales Office shall mean an office structure belonging to the developer / builder for the sale of homes / property in a specific development / subdivision

Seasonal shall mean the limited time of the year where certain services apply to the subject roadway (e.g. summer roads, ice roads). In the context of these definitions, seasonal roads are classified as those not receiving winter services, unless otherwise defined.

Section shall mean a portion of roadway with a distinct classification, and homogeneous character. A roadway section is commonly used for construction costing, inventory control in Maintenance Management Systems, Road Evaluation Studies, Pavement Condition Studies, and Priority Planning and Budgeting.

Service shall mean the supply of a public need such as transportation infrastructure or utilities construction, installation, or maintenance.

Service Level(s) shall mean the range of value(s) which specifically define the level of a particular service, by one or more parameters.

Shoulder shall mean the maintained surface immediately adjacent to the travelled surface of the road. The shoulder may be partially or fully hardtop, loosetop, grassed, or earth. It is not considered a part of the road for these services.

Shoulder Width shall mean the measured edge of the actual outside travelled lane except that for loosetop road surfaces the measure is from the outside edge of the minimum lane width. Width is measured to the beginning edge of a rounding, where the surface ceases to be maintained for emergency or temporary vehicle use.

Sidewalk shall mean a paved walkway contained within the Township Right of Way and typically constructed on one side of a street or road.

Silt / Sediment shall mean the naturally occurring granular material of a size somewhere between sand and clay that is broken down by processes of weathering, erosion or construction activity and is subsequently transported by the action of wind, water, or ice, and / or by the force of gravity acting on the particles.

Standard Drawings shall mean the drawings included as part of this manual, illustrating typical installations and/or specifying materials as adopted by the Township of Oro-Medonte.

Standards shall mean quantified statements, defining the nature of a product or activity. Usually such standards are minimum or reasonable, and in this context refer specifically to the development of services as defined by the Township.

Sub-Contractor(s) shall mean a company or individual acting as an installer / supplier of services to the Contractor and having entered into a contract with the Contractor to install / supply those services.

Substandard shall mean a condition which is outside the defined standard. Normally a substandard condition requires a response, unless otherwise considered in the standard.

Substantial Completion shall mean the acceptance of **Underground Services Works** as required in the Subdivision Agreement up to and including the following (as applicable):

Underground Services - storm drainage works (including culverts, storm sewers and detention pond), waterworks, sanitary works, underground electrical distribution

system, energized streetlighting, natural gas distribution, telephone, and cable television distribution, base course asphalt, and temporary signage.

Surface shall mean the exposed top of the travelled road and includes adjacent surfaces for turning or stopping, but not parking or shoulders.

TAC shall mean the Transportation Association of Canada.

TCE shall mean TC Energy (formerly Trans Canada Pipelines).

Traffic Control Devices shall mean devices for the advising and routing of traffic including regulatory signs, non-regulatory signs, pavement markings, and hazard markers.

Trailway / Walkway shall mean a path designed for pedestrian use and may be either paved or surfaced with a compacted granular material.

Township shall mean the Corporation of the Township of Oro-Medonte and its designated officials and/or agents.

Township of Oro-Medonte Development Engineering Policies, Process and Standards shall mean this document and may also be refered to herein as Township Standards.

Township's Engineering Consultant shall mean a competent professional engineer or firm of engineers employed by the Township which is skilled and experienced in Township work and land development projects, registered with Professional Engineers Ontario, and possessing a current Certificate of Authorization to practice Professional Engineering as required by the Professional Engineers Act. The Township's Engineering Consulting shall have authority to act as the Township's Representitive.

Township's Representative shall mean any person assigned to a project by the Township to carry out work on its behalf. The name of the Representative shall be specified prior to the start of construction on any project.

Underground Services include services to be constructed by the Developer pursuant to the terms of the Subdivision Agreement. These servicing works include (but are not limited to): storm drainage works (including culverts, storm sewers and detention pond), waterworks, sanitary works, energized streetlighting, underground electrical distribution system, natural gas distribution, telephone, and cable television distribution (as applicable).

Urban Settlement Area shall mean a concentrated settlement that constitutes or is part of an urban area. It is an area with a higher density of human-created structures and is serviced by municipal water delivery and / or municipal sewage collection.

Vertical Clearance shall mean an obstruction free zone measured from any point on the surface of the road and above the projection of the horizontal clearance width.

Winter shall mean the season when cold weather conditions have effect on road conditions can be reasonably expected.

1.3 Township Mapping Index

Township of Oro-Medonte (Overall)

Development Areas - Residential

1 – Shanty Bay

2 – Oro Station

3 – Hawkestone

4 – Forest Home

5 – Prices Corner

6 – Warminster

7 – Braestone

8 – Sugar Bush

9 – Horseshoe Valley

10 – Bidwell Road

11 – Craighurst

12 – Moonstone

Development Areas - Industrial / Commercial

A – Hollick / Winstar Road

B – Airport

C – Small Crescent

D – Forest Plain

E – Oro Centre

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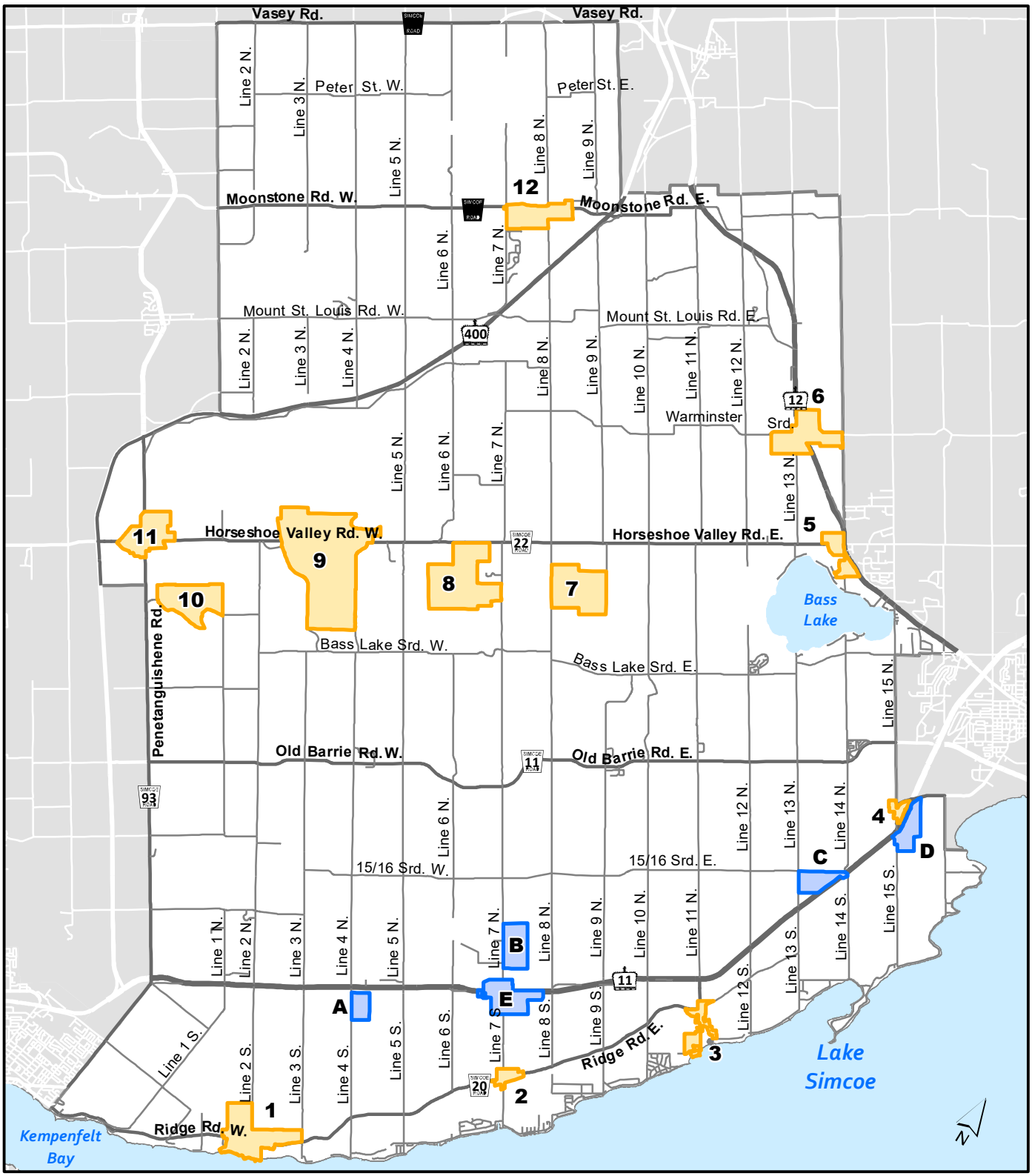
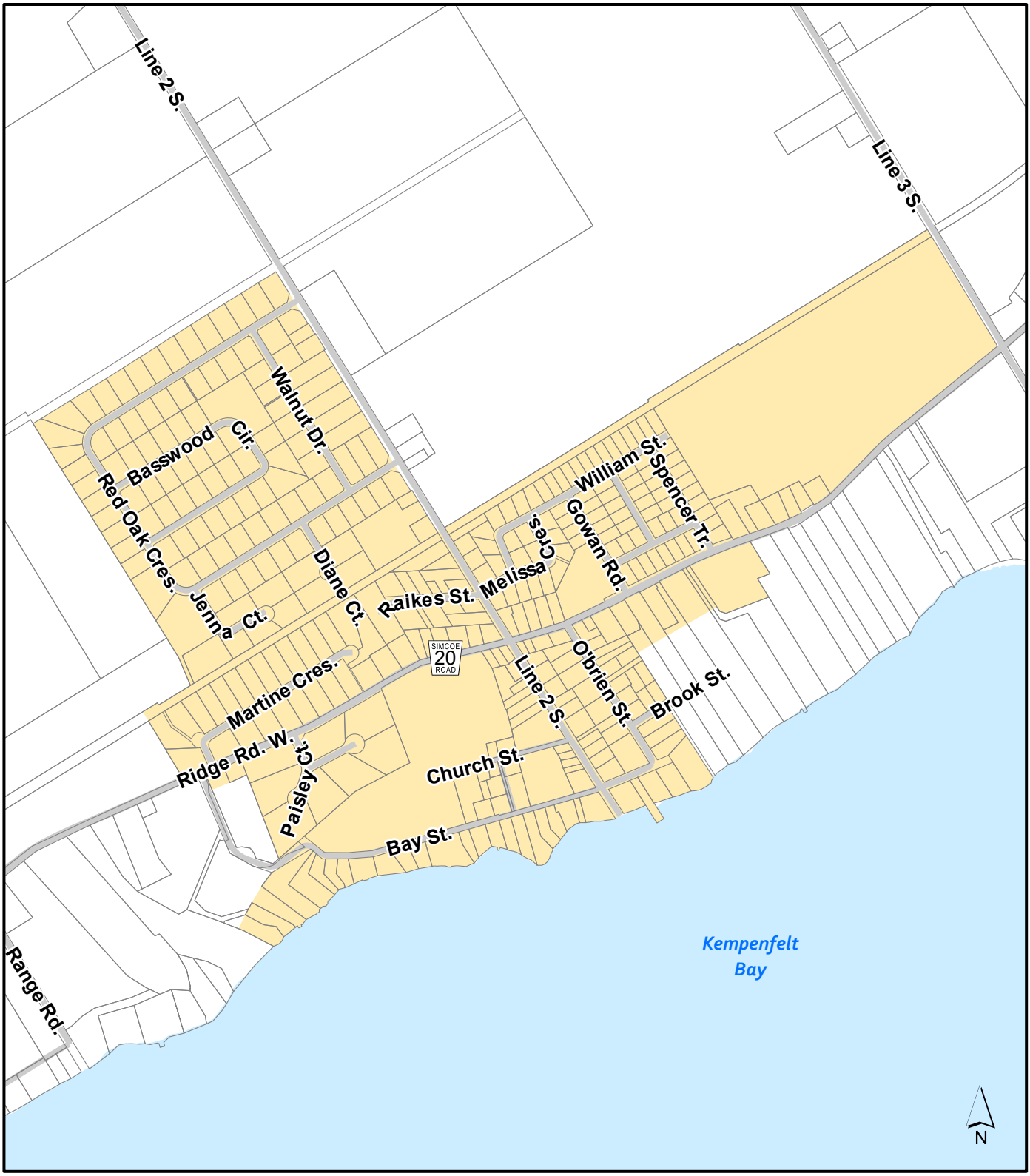


Development Areas

Residential
Industrial

March 2022

Township of Oro-Medonte
Proud Heritage, Exciting Future

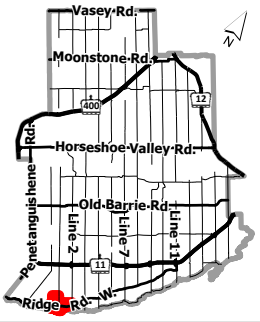


Development Area

1

Shanty Bay

January 2018



Township of Oro-Medonte
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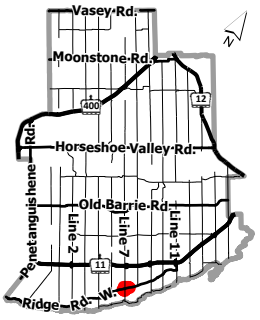
Development Area

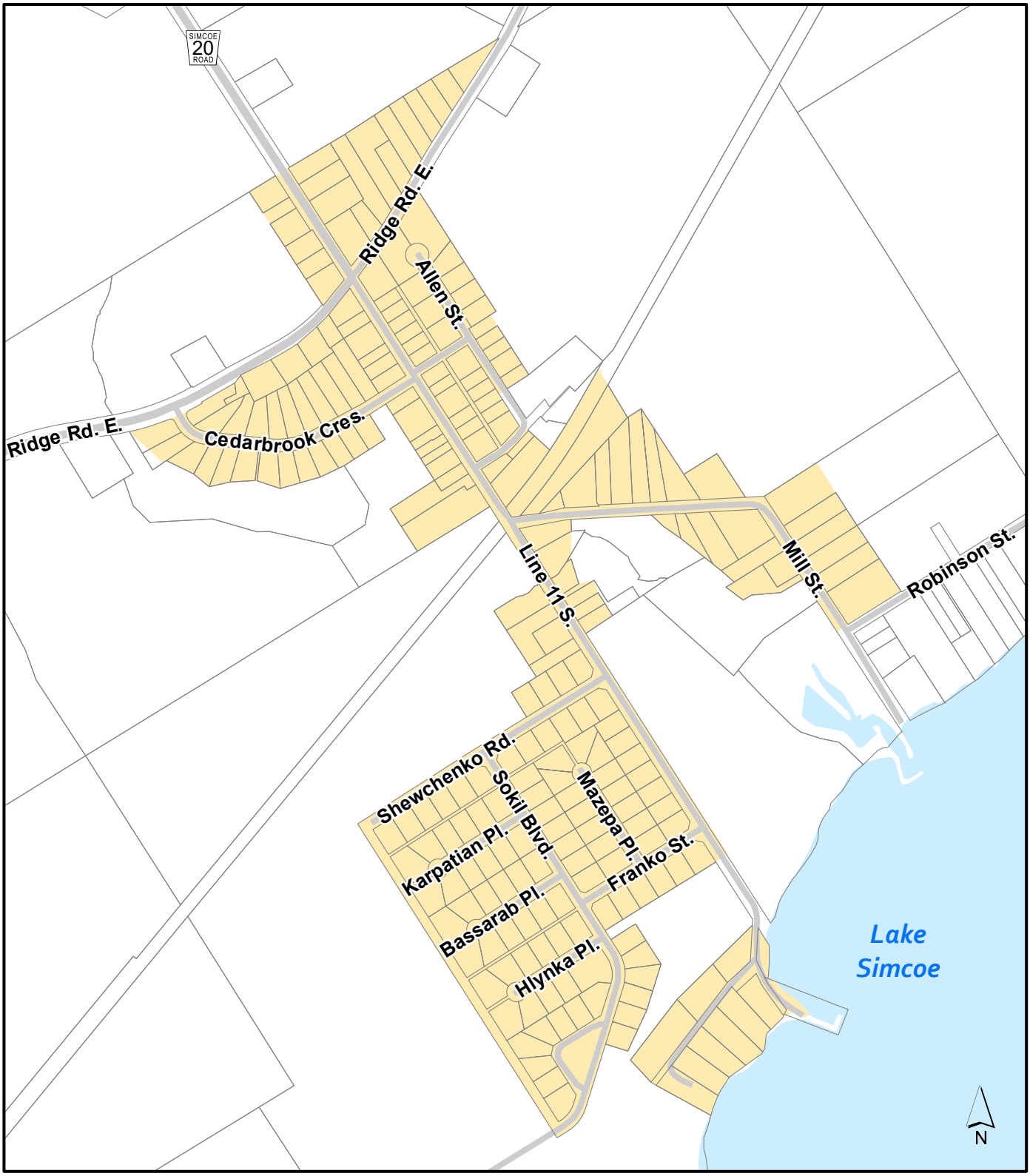
2

Oro Station

January 2018

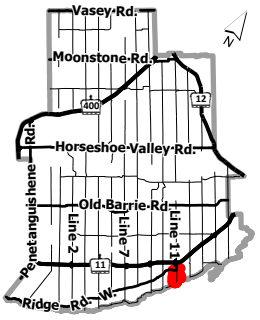


Township of Oro-Medonte
Proud Heritage, Exciting Future



Development Area 3 Hawkestone

January 2018



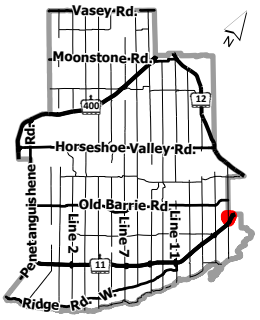
Township of Oro-Medonte
Proud Heritage, Exciting Future

Development Area

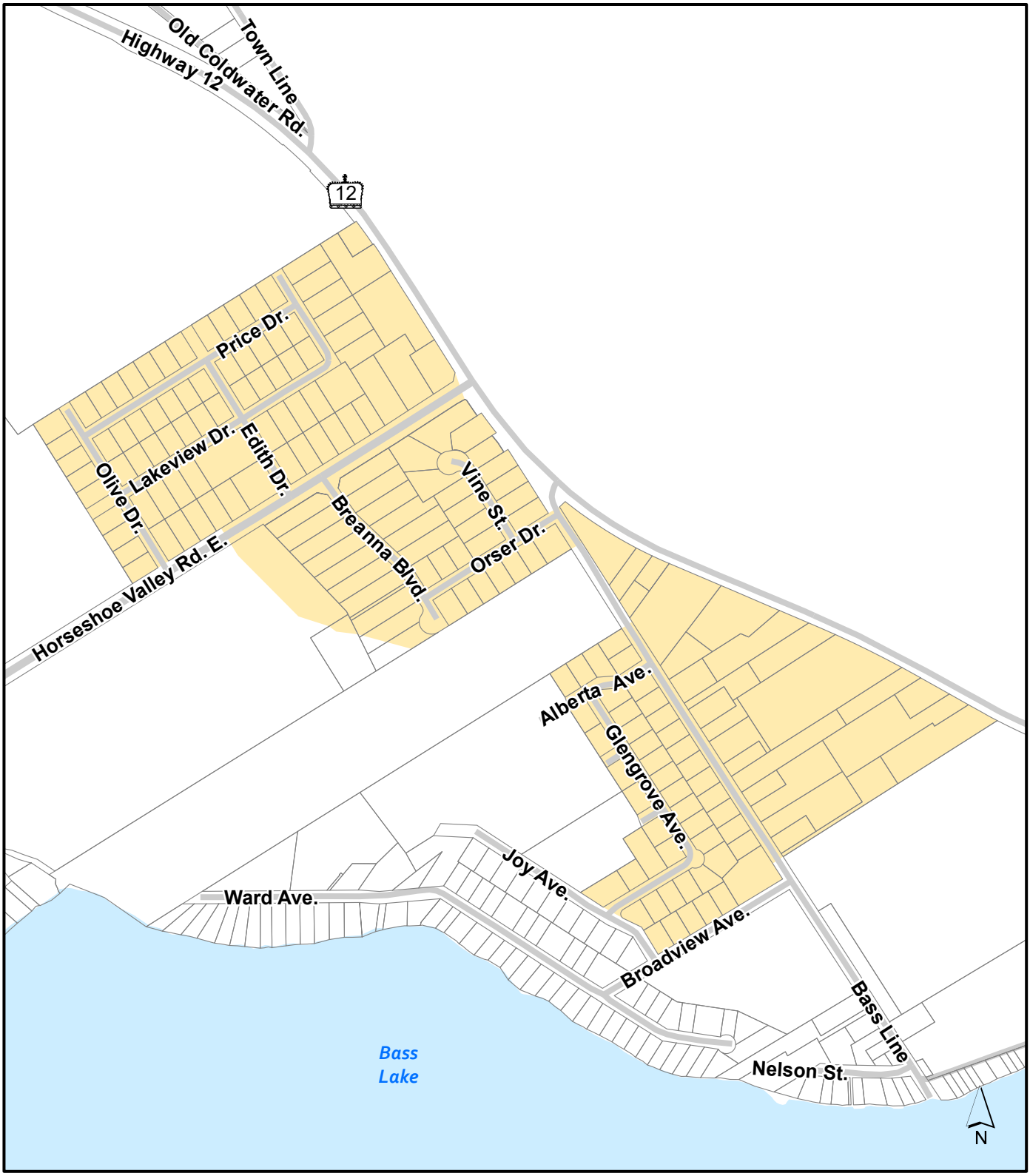
4

Forest Home

January 2018



Township of Oro-Medonte
Proud Heritage, Exciting Future

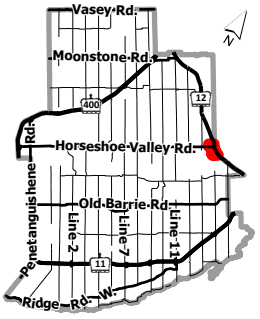


Development Area

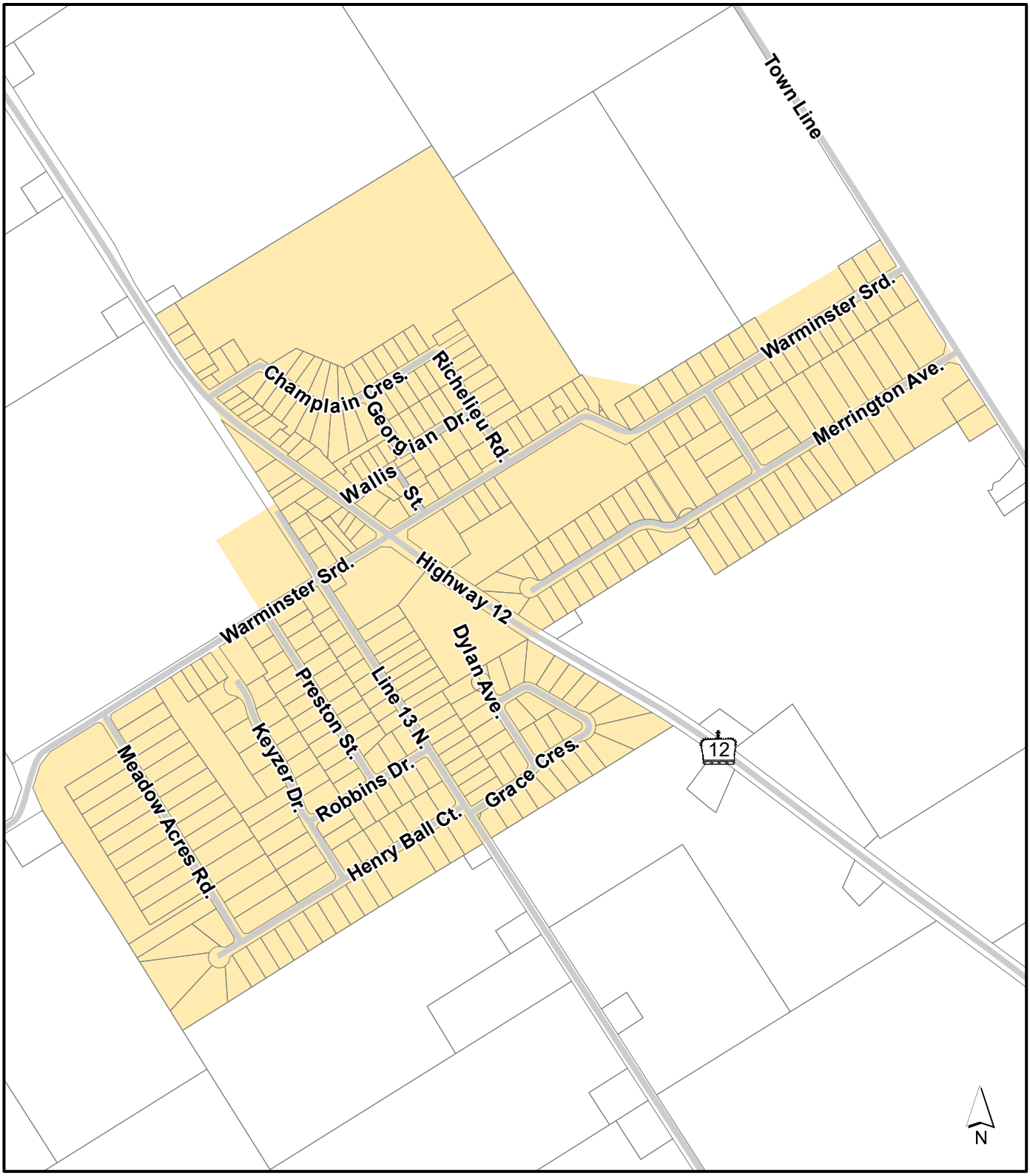
5

Prices Corners

January 2018



Township of Oro-Medonte
Proud Heritage, Exciting Future

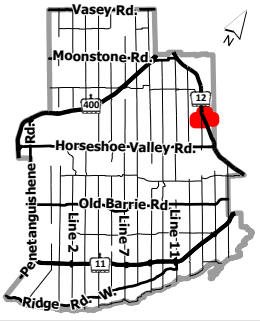


Development Area

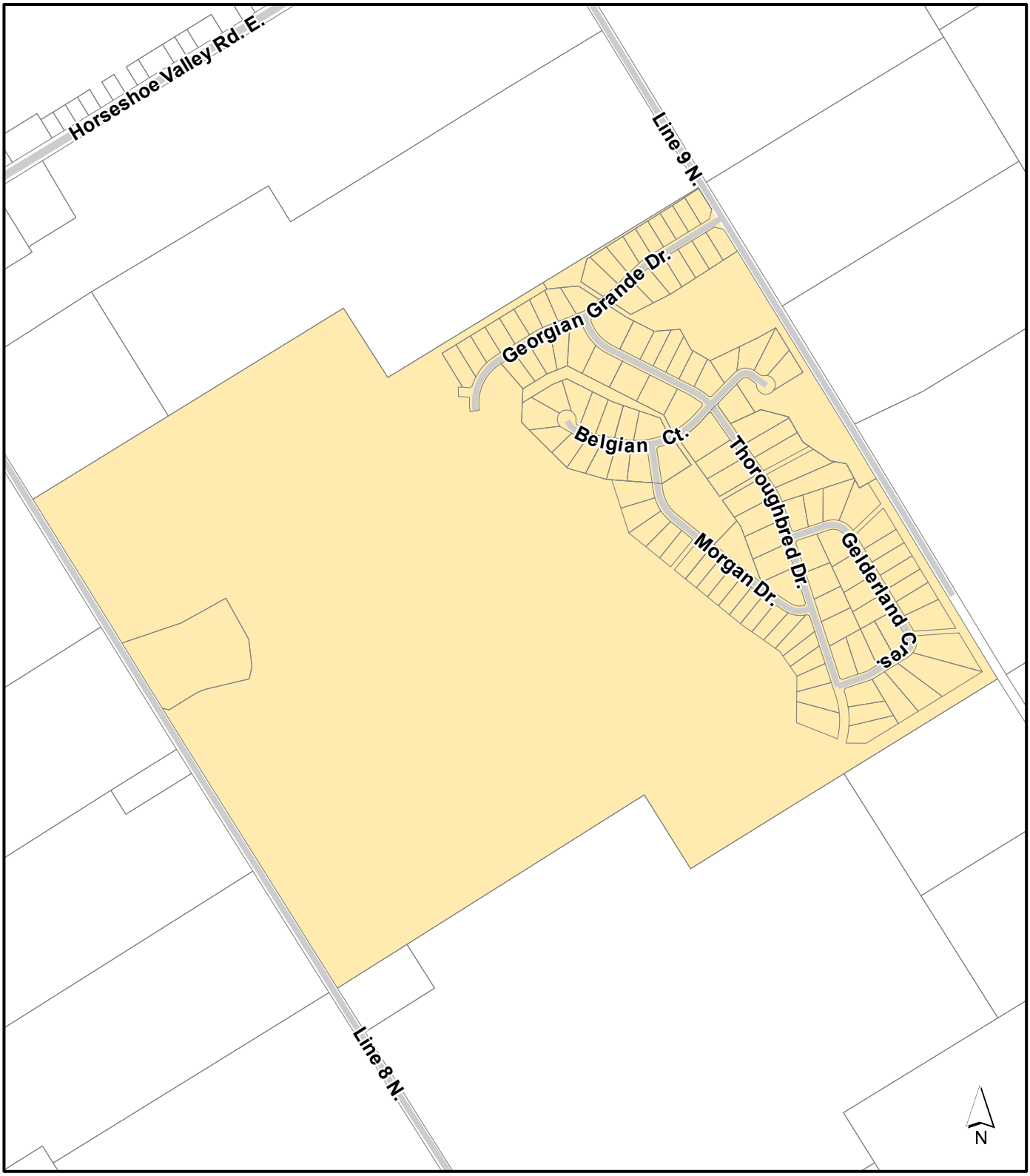
6

Warminster

January 2018



Township of Oro-Medonte
Proud Heritage, Exciting Future

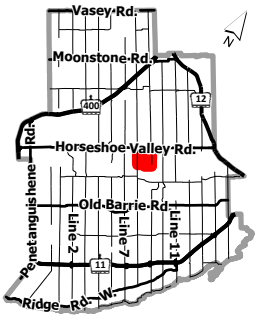


Development Area

7

Braestone

January 2018



Township of Oro-Medonte
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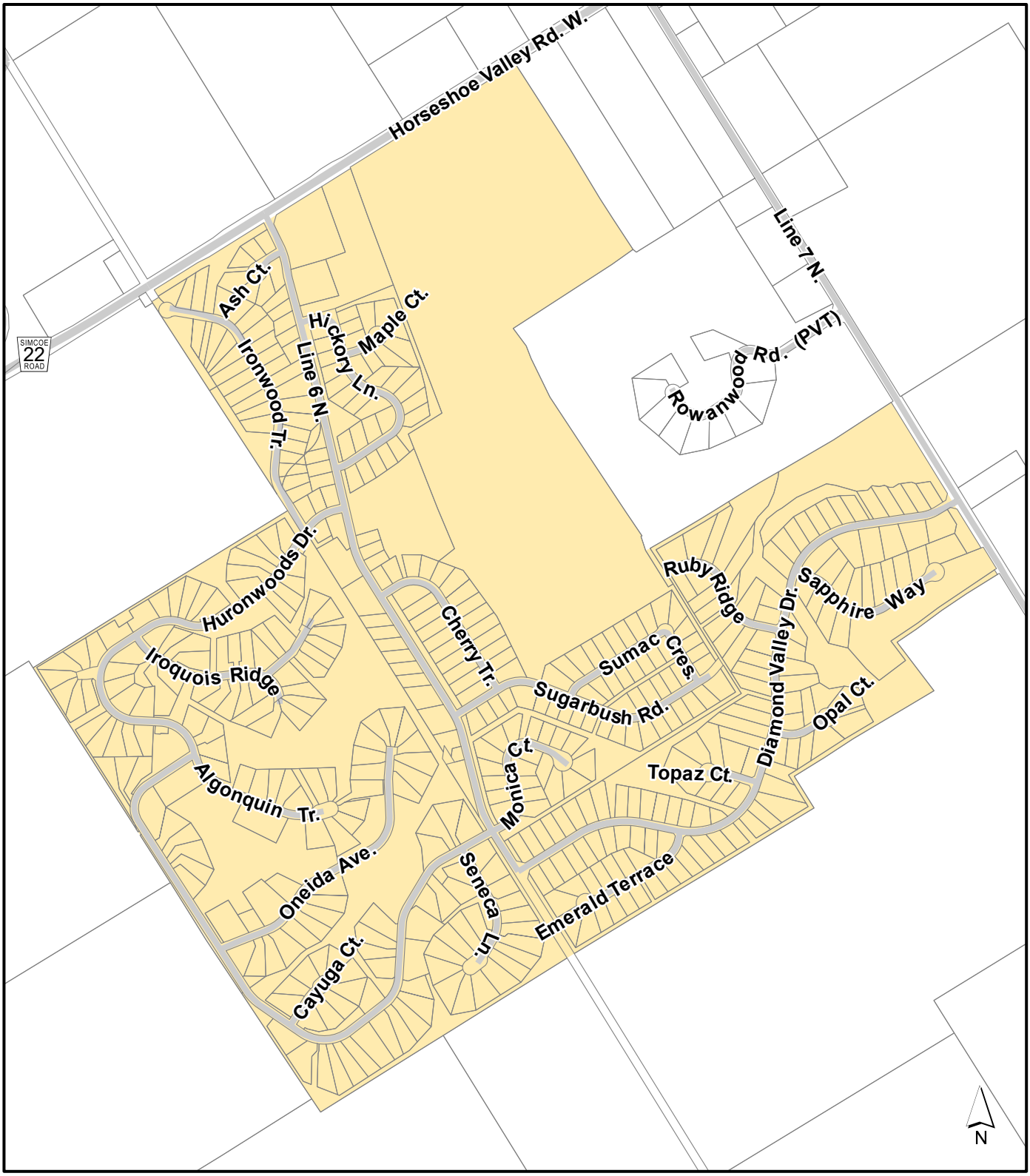
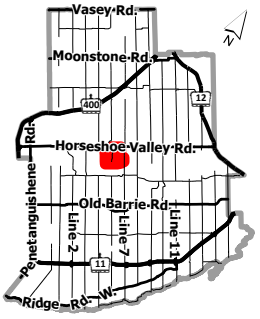


Development Area

8

Sugar Bush

January 2018



Township of Oro-Medonte
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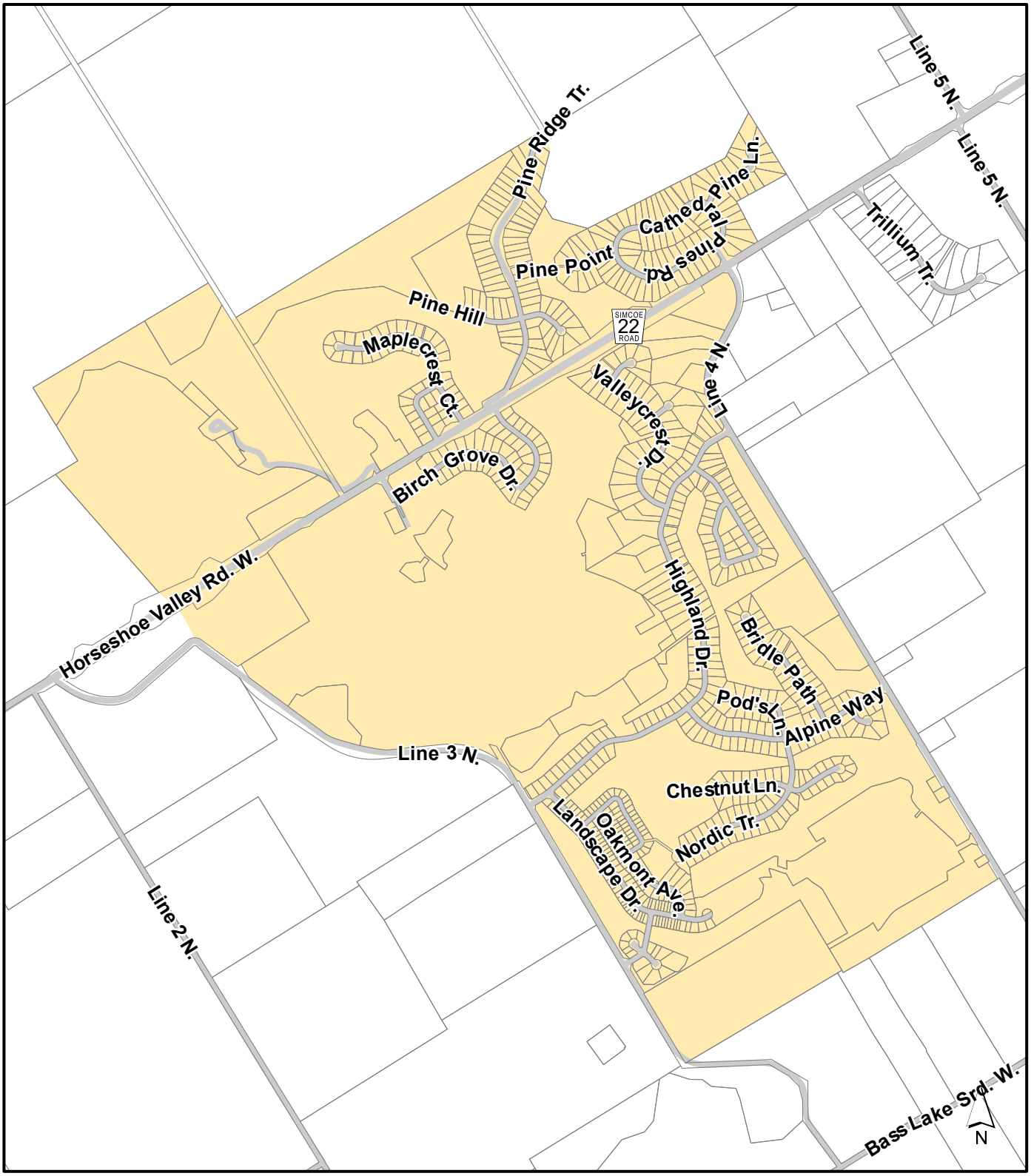
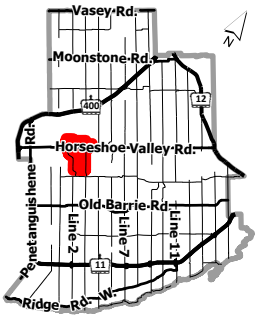


Development Area 9

Horseshoe Valley

January 2018



Township of Oro-Medonte
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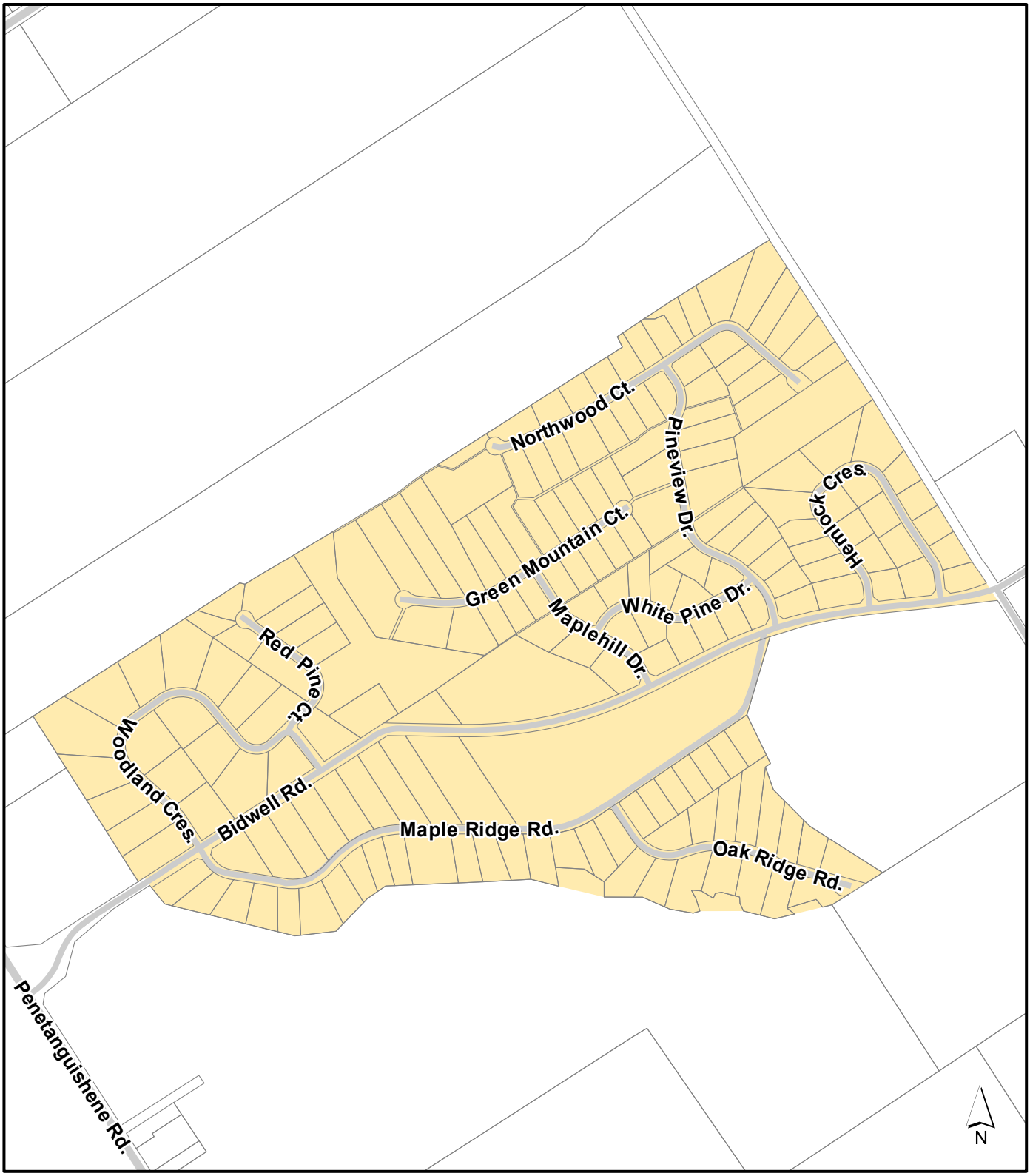
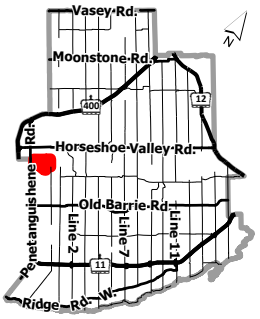


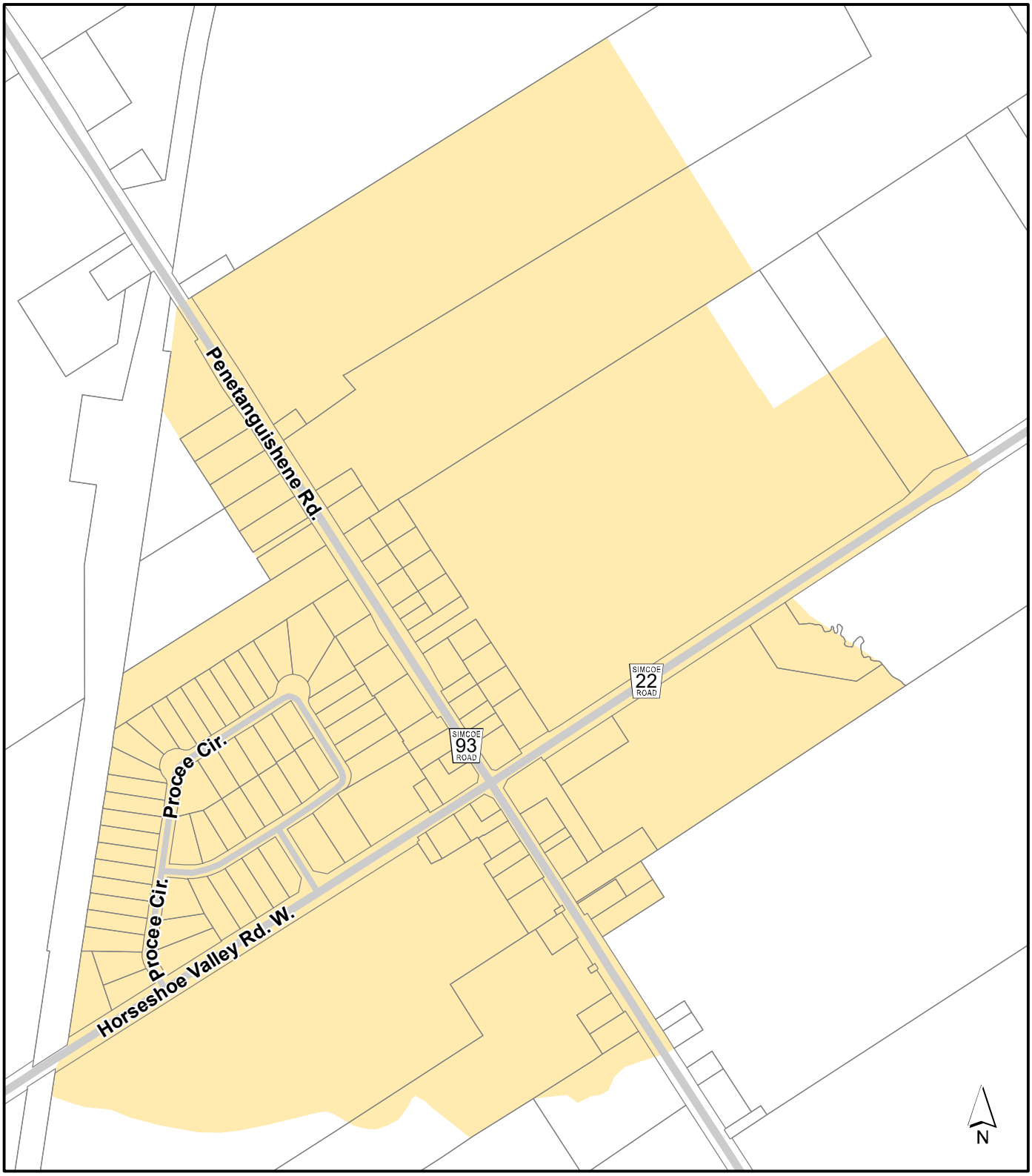
Development Area 10

Bidwell Road

January 2018

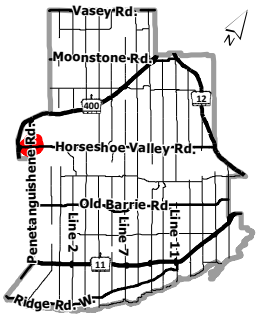


Township of Oro-Medonte
Proud Heritage, Exciting Future

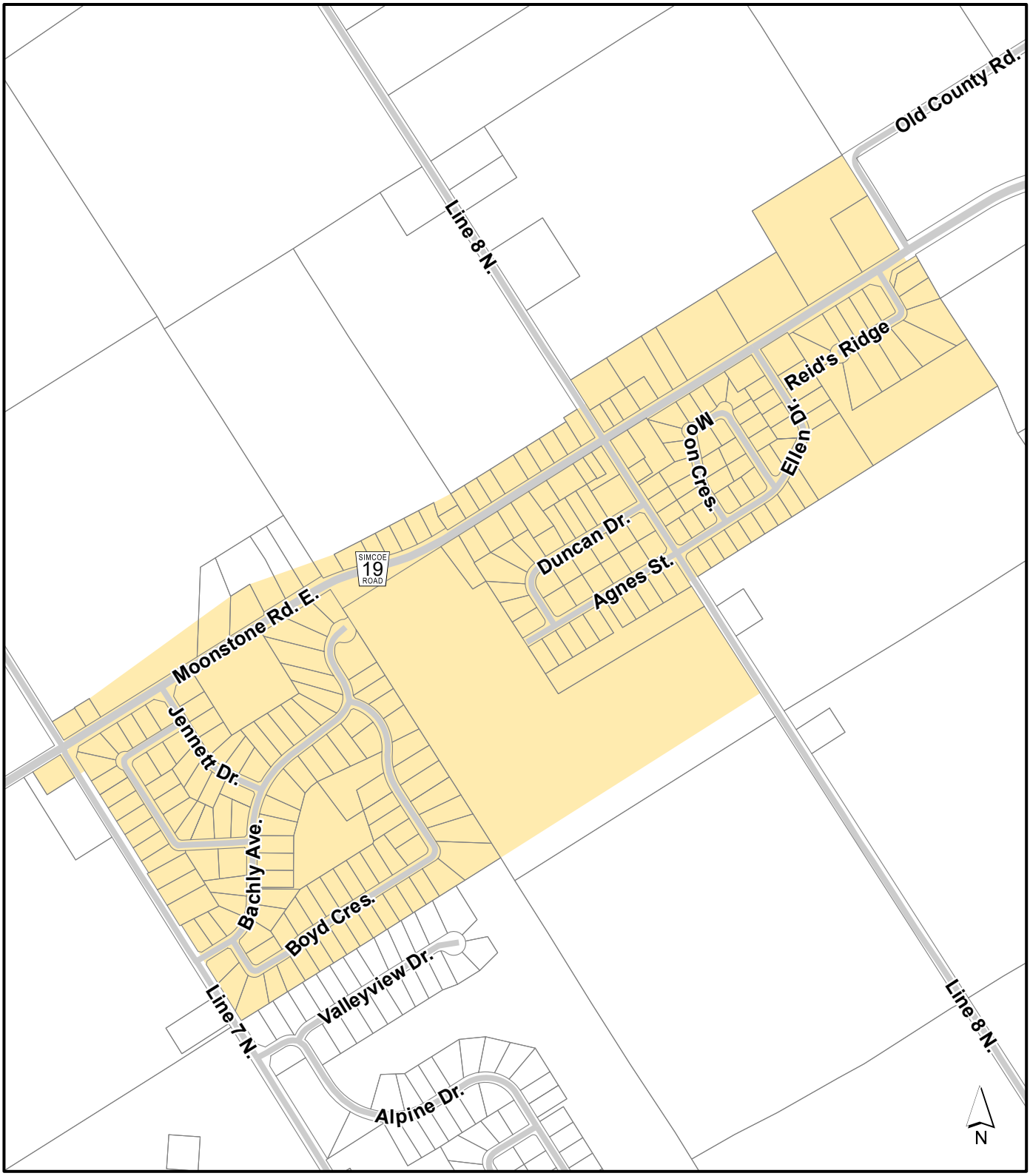


Development Area 11 Craighurst

March 2022



Township of Oro-Medonte
Proud Heritage, Exciting Future

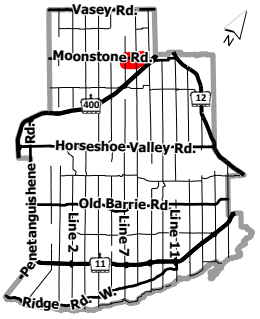


Development Area

12

Moonstone

January 2018



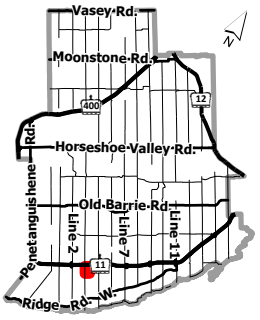
Township of Oro-Medonte
Proud Heritage, Exciting Future

Development Area

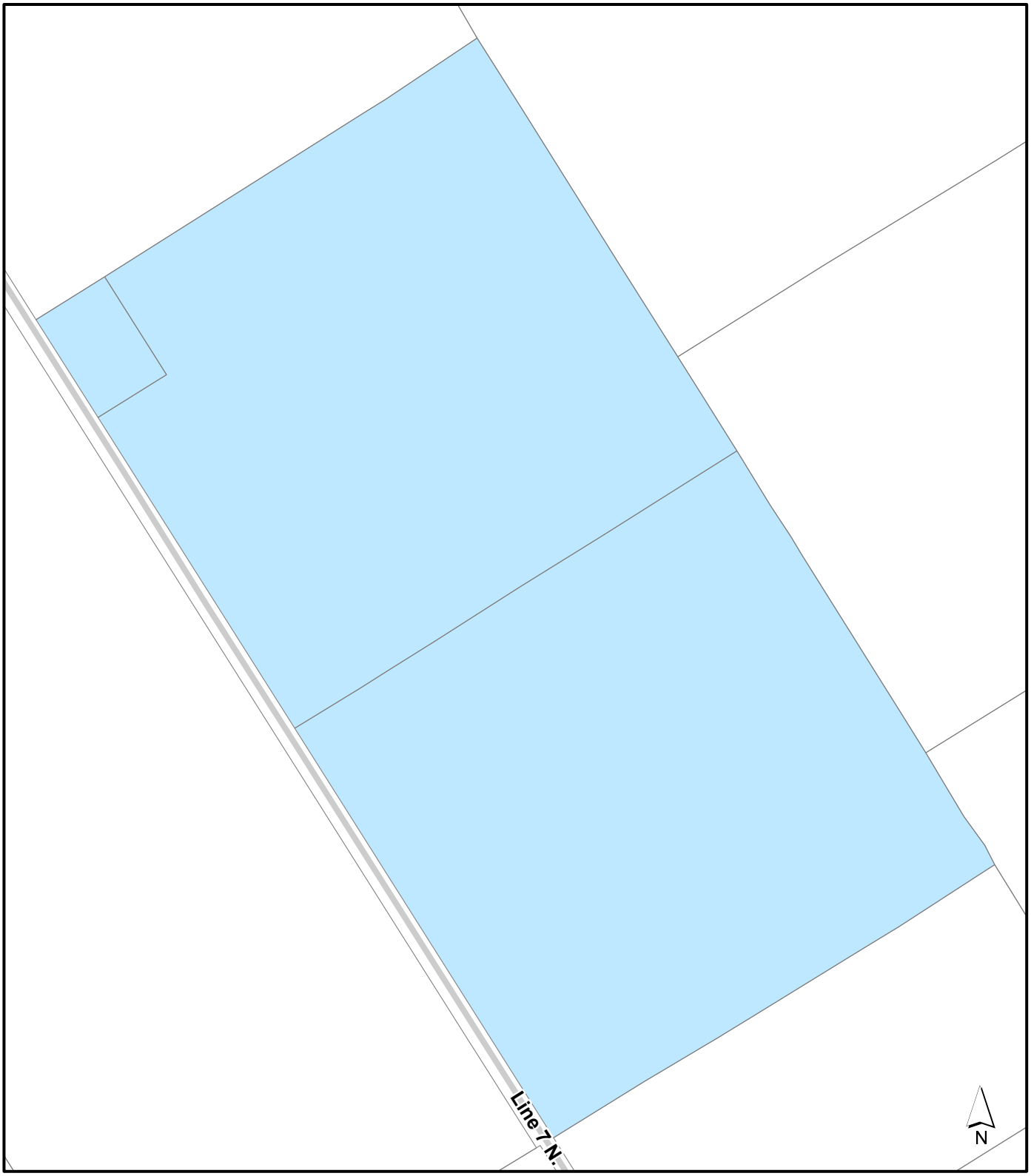
A

Hollick/Winstar Rd.

January 2018



Township of Oro-Medonte
Proud Heritage, Exciting Future

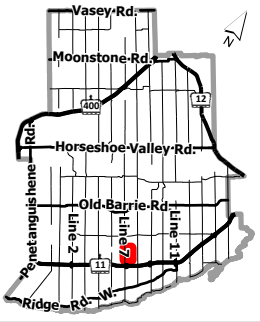


Development Area

B

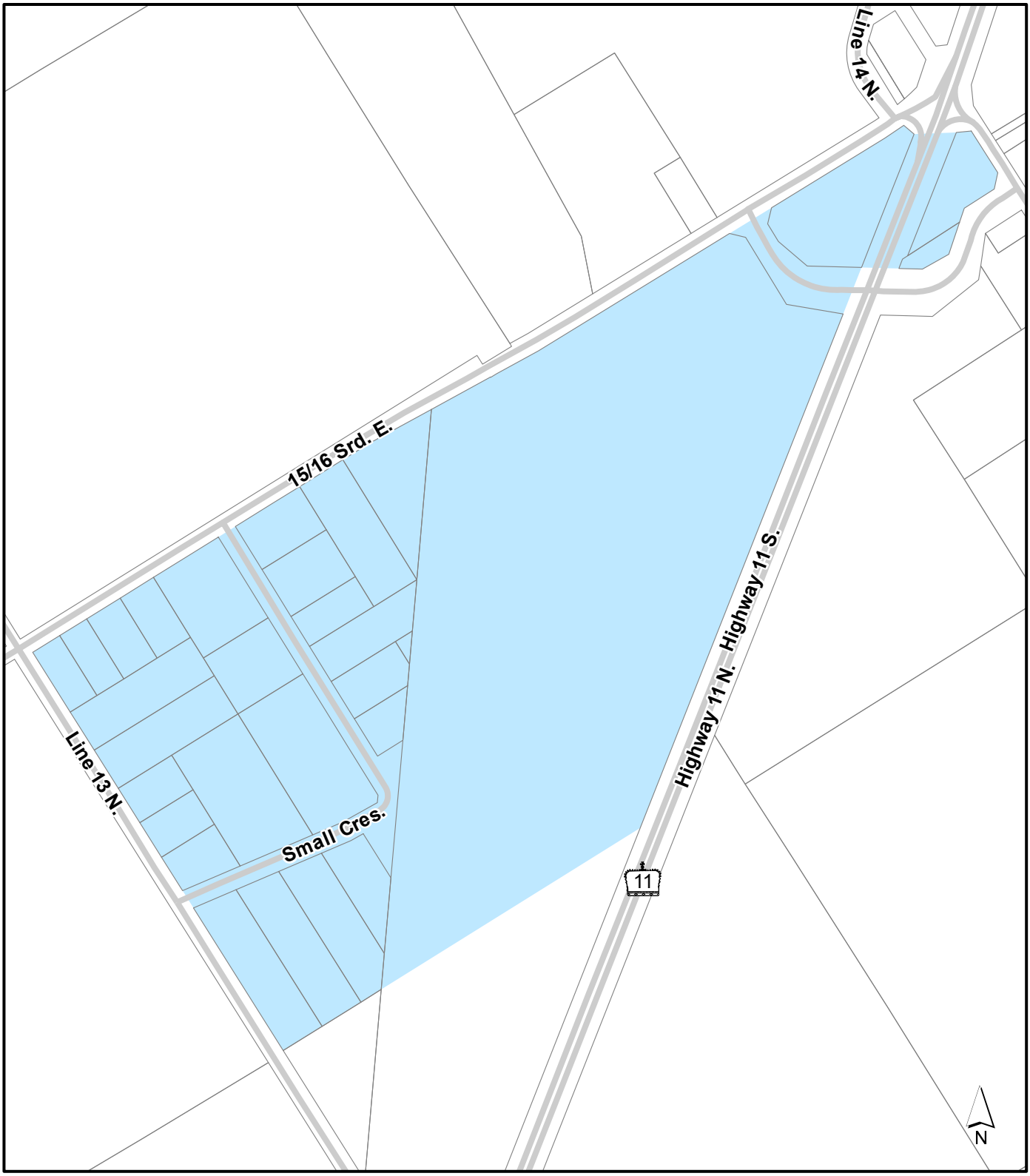
Airport

January 2018



Township of Oro-Medonte

Proud Heritage, Exciting Future

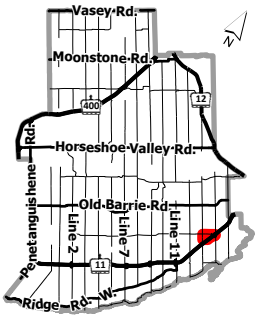


Development Area

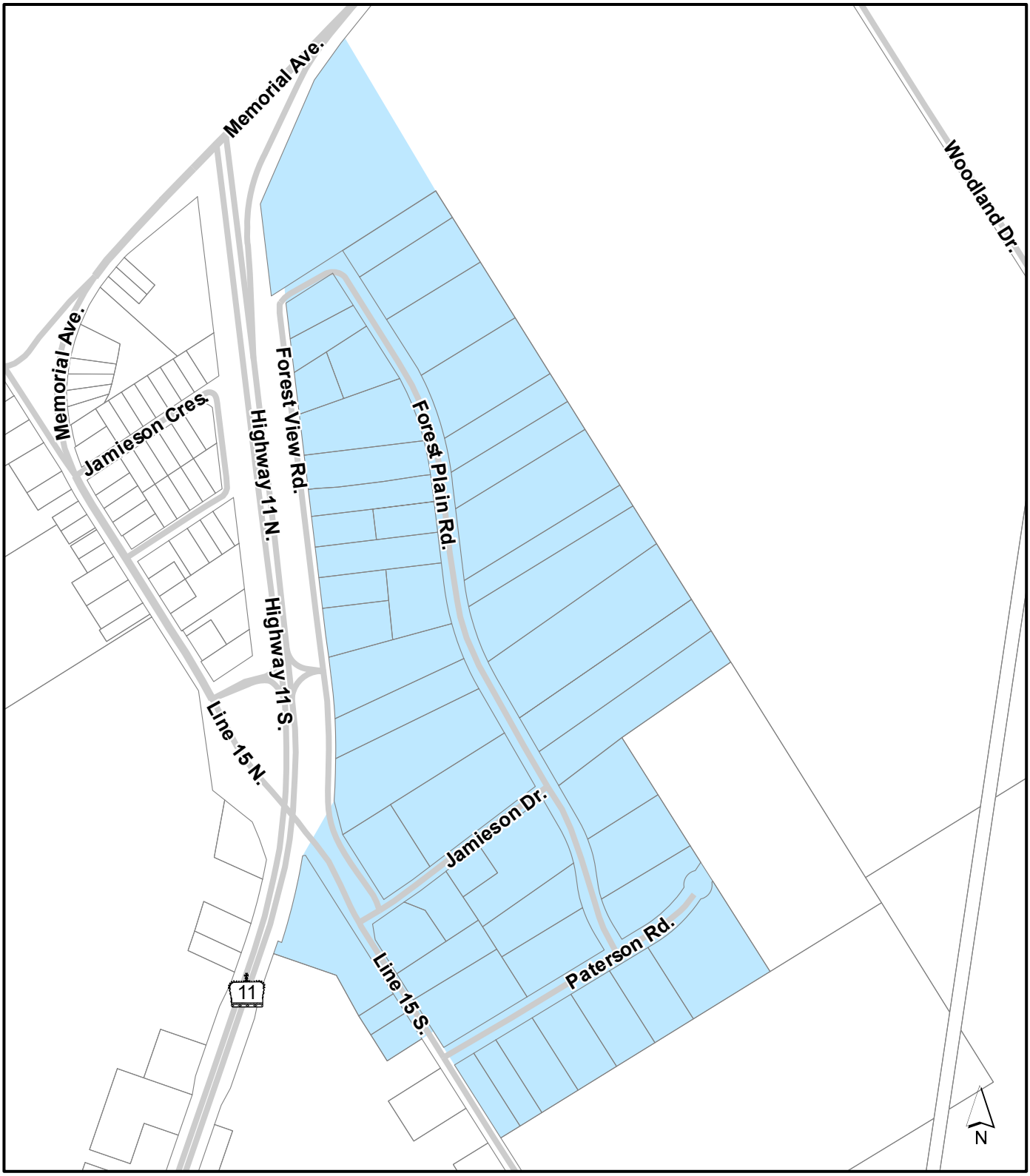
C

Small Crescent

January 2018



Township of Oro Medonte
Proud Heritage, Exciting Future

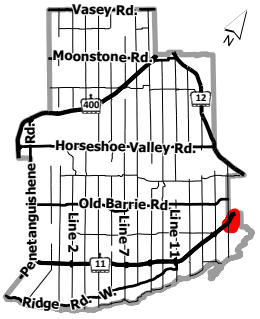


Development Area

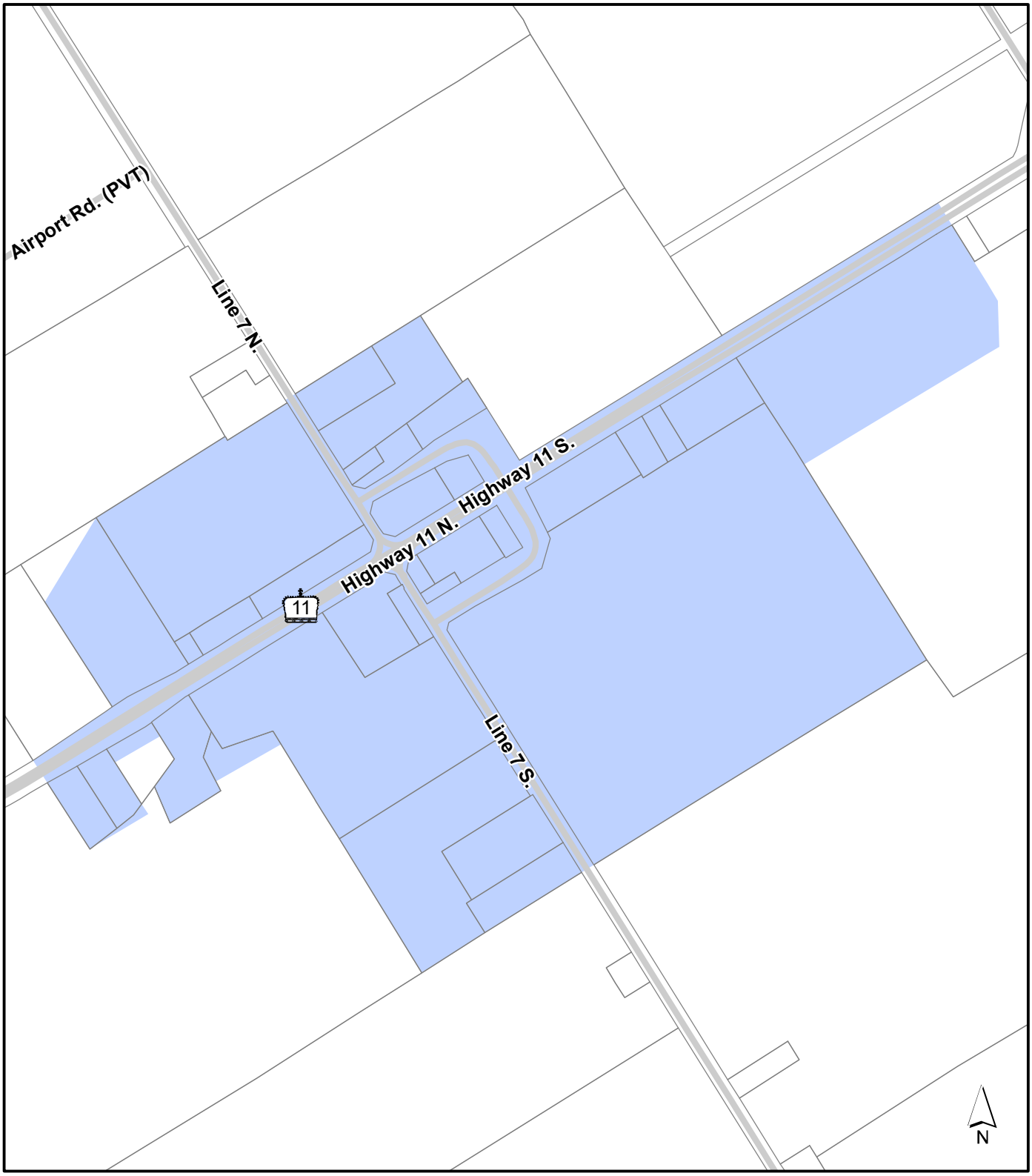
D

Forest Plain

January 2018



Township of Oro-Medonte
Proud Heritage, Exciting Future

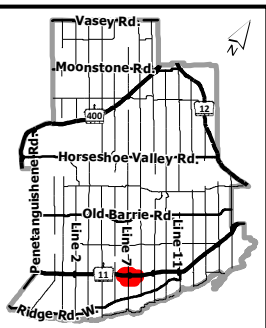


Development Area

E

Oro Centre

March 2022



Township of Oro-Medonte

Proud Heritage, Exciting Future

SECTION 2 – POLICIES and PROCESS

2.1 Pre-Servicing Policy

Subsequent to Draft Plan Approval and prior to execution of a Subdivision Agreement, the Township may consider agreeing to allow the Pre-Servicing of a Subdivision.

Pre-Servicing shall be deemed to include the following works: topsoil stripping, earthworks to adjust grade(s) and drainage, blasting, tree cutting and stump removal, underground utilities servicing and road construction to base course asphalt. These works shall be constructed at the Developer's risk when the following conditions have been met:

- Written acceptance from the Township specifying the approved Pre-Servicing works.
- Accepted for Construction Engineering Drawings for the works under consideration.
- Written approval by agencies, e.g., Lake Simcoe Region Conservation Authority, Nottawasaga Valley Conservation Authority, Ministry of the Environment, Conservation, and Parks, Ministry of Northern Development, Mines, Natural Resources and Forestry, Ministry of Transportation, Ministry of Tourism, Culture and Sport, County of Simcoe where they relate to installation of services permitted by pre-servicing.
- Written approval from the County of Simcoe regarding the requirement to obtain their exemption/clearance for any tree cutting proposed through the pre-servicing as per the Forest Conservation By-law 6894, As Amended.
- Written confirmation from utility companies including, but not limited to, Hydro One, Bell Canada, Rogers Cable, and Enbridge Gas, that satisfactory agreement has been reached for provision of respective services.
- **No** permission shall be given to construct External Service Works prior to full registration **unless** Securities for 110% of the estimated cost of the External Service Works including all restoration have been deposited with the Township. Connections to existing services shall **not** be permitted until the plan of subdivision is registered.
- **All** other documents considered necessary to the works including 0.3 m reserves, easements, shall be approved by the Township / respective Agency as to the form, description and location.

- Cash deposits for Engineering and Legal Fees for the Township, in an amount determined by the Township, shall be paid to the Township prior to the commencement of any works.
- An Insurance Certificate naming the Township of Oro-Medonte and their Engineering Consultants as co-insured is to be submitted with minimum coverage of **$5,000,000.00** or an additional amount as determined by the Township.
- A Cash or Letter of Credit deposit to facilitate Securities equalling 100% of the estimated cost of **all** siltation and erosion control installation and potential emergency maintenance work carried out by the Township is to be submitted in an amount determined by the Township.
- A Cash or Letter of Credit deposit to facilitate Securities equalling 50% of the estimated cost of **all** internal services proposed to be installed (up to and including all Underground Services Works) has been deposited with the Township.
- If Pre-Servicing has been completed to the satisfaction of the Township prior to the registration of the plan of subdivision, the Township **may** not require the full value of the Letter of Credit provided an appropriate reduction request has been submitted and approved by the Township.
- The Developer is required to enter into a formal Pre-Servicing Agreement based on the scope of development.
- Applicable fees submitted to the Township for preparation of a Pre-Servicing Agreement as required by the Township's Fees and Charges By-law 2021-130 As Amended (or most recent By-law).
- Approved Zoning for the proposed development is in place.
- In **all** cases the subdivision lands shall be restored and maintained to a condition such that they are kept free of nuisance debris, mud, and dust at **all** times.
- Where earth excavation, brush, muck, stumps, etc. are to be removed from site, they shall be disposed of in accordance with the latest MECP approved regulations (at an approved soils transfer site, dump site or landfill location).
- In **all** cases, the ditches, side-slopes, and banks shall be restored to a condition satisfactory to the Township. In both urban and suburban areas this shall include

topsoil, sod or seed with proper after-care of **all** land on the R.O.W. disturbed during the construction of the road.

- Unless otherwise approved, no earth ditch or embankment shall have a slope greater than 3:1 run/rise. Where required in the opinion of the Township, a significant structure or special slope stabilizing procedures may be required.
- **All** rock faces left exposed in cut shall be cleared of loose rock debris and earth and soils shall be cut back from the top of the rock by at least 0.5m.

2.1.1 Model Homes

Subsequent to Draft Plan Approval and prior to execution of a Subdivision Agreement, the Township may consider allowing construction of a model home (which may or may not be used as a sales office) at the Developer's risk, when the following conditions have been met:

- A Pre-Servicing Agreement has been executed and **all** requirements are met.
- Applicable fees submitted to the Township for preparation of a Pre-Servicing Agreement as required by the Township's Fees and Charges By-law 2021-130 As Amended (or most recent By-law).
- Approved Zoning for the proposed development is in place.
- An agreement for the construction of a model home has been executed with the Township dealing with:
  - Provision of a builder's road.
  - Provision of services (sewer, water, hydro) if available.
  - Provision of fire protection. (If not Fire Department approval shall be required)
- The overall grading plan for the subdivision has been approved and there has been preliminary acceptance of the drainage system for the model home lots.
- For a model home building permit application, security is provided to the Township in the amount of $20,000.00 to ensure that the obligations of the Developer are carried out as required by the terms of the Agreement or provide for the demolition and removal of the structure if the subdivision plan does not proceed to registration within one year.

- Confirmation that model homes shall not be occupied until after registration of the Subdivision Agreement and Plan and **all** requirements within the Subdivision Agreement, including Occupancy Requirements are met.
- Confirmation that issuance of building permits for model homes is entirely at the risk of the Developer and without liability or responsibility to the Township.
- The Developer shall indemnify the Township from **all** damages arising in connection with the issuance of building permits for model homes.
- Confirmation that the Developer agrees that the use of model home lots shall be restricted to the following: parking; a sales office; model homes display.

2.1.2 Sales Office and / or Site Office

In the event the Developer intends to utilize trailers or temporary structures or combination of both as a Sales Office and / or a Site Office the Township may consider allowing the construction under the following conditions:

- The Sales Office and / or a Site Office is to be located on a proposed lot fronting on an existing opened road allowance within the proposed development limits.
- Approved Zoning for the proposed development is in place.
- An agreement for the Sales Office and / or a Site Office has been executed with the Township dealing with:
    - An acceptable site plan.
    - Provision of fire protection - If not Fire Department approval shall be required.
    - Provision of services (sewer, water, hydro) if available.
- The overall grading plan for the subdivision has been approved and there has been preliminary acceptance of the drainage system for the sales office lot.
- Security is provided to the Township in the amount of $10,000.00 to ensure the obligations of the Developer are carried out as required by the terms of the Agreement or provide for the demolition and removal of the structure if the subdivision plan does not proceed to registration within one year.
- Applicable fees submitted to the Township for preparation of a Pre-Servicing Agreement as required by the Township's Fees and Charges By-law 2021-130 As Amended (or most recent By-law).

- Confirmation that issuance of a building permit for the sales office is entirely at the risk of the Developer and without liability or responsibility to the Township.
- The Developer shall indemnify the Township from **all** damages arising in connection with the issuance of building permits for the Sales Office and / or a Site Office.
- Confirmation the Developer agrees the use of the Sales Office and / or a Site Office lot shall be restricted to parking at the Sales Office and / or a Site Office.
- One Sales Office and / or a Site Office shall be allowed for marketing homes and / or managing the construction and servicing within the development.

2.2 Subdivision Agreements

2.2.1 Preparation of Subdivision Agreement

The draft of the Subdivision Agreement shall be prepared by the Township and may be subject to review by the Township Solicitor. The final Subdivision Agreement shall be prepared under the direction of the Director of Development Services in consultation with various Township departments.

The Director of Development Services shall be in a position to clear **all** conditions of Draft Plan Approval prior to the execution of the Subdivision Agreement.

In conjunction with preparation of the Subdivision Agreement the Developer's Consulting Engineer or Consulting Planner shall provide the Township, by way of a Township accepted electronic submission method, the following:

- Matrix identifying how and when each condition of Draft Plan Approval has been satisfied, including copies of all supporting clearance letters / documents.
- Ministry of Environment and Conservation and Parks documentation for approval for Township services to be constructed for the proposed subdivision.
- The name of the person and title and/or company and Mortgagees with whom the Subdivision Agreement shall be executed. The Developer's address and telephone number shall be provided.
- The name, address, and telephone number of the Developer's Solicitor.
- The Transfer / Deed of Land (Form 1 Land Registration Reform Act).

- The legal description of the subdivision, based on the Reference Plan or Transfer / Deed of Land.
- The proposed final plan for registration (M-Plan) complete with the road names, lot numbers, surveyor's certificate, Developer's certificate, and **all** other pertinent information required by the registry office.
- The final draft reference plans for any easements to be granted to the Township. (Copies of the deposited plans, instruments related to transfer of lands (e.g. SWM, Park Blocks) and easement to be provided prior to final assumption.)
- The engineering drawings, Accepted for Construction by the Township.
- The "M" and "R" Plans reduced to legal size.
- A breakdown of the number of units proposed within the subdivision:
    a. Single-family units b. Semi-detached units c. Townhouse units
    d. Apartment units: one bedroom and bachelor *OR* two or more bedrooms
- An O.L.S. certificate in tabular form identifying and certifying **all** lots and corresponding frontages, depths and areas are compliant with the appropriate Zoning By-Law.
- A detailed cost estimate of Township services to be constructed for the subdivision. The cost estimate shall be signed and sealed by the Developer's Consulting Engineer.
- An Insurance Certificate is to be submitted naming the Township as co-insured with minimum coverage to be $5,000,000.00 or an additional amount as determined by the Township.

The estimated cost of Services shall be detailed to show individual items of construction. This estimate shall be used as a basis for calculation of the security to be posted for the development.

The total estimated cost of Services shall include the following:

- Detailed cost of services, in the format provided by the Township;
- The actual estimated cost of streetlighting and the associated underground distribution system;
- Any other miscellaneous expenditures required by the Subdivision Agreement as

the Developer's obligation, such as park equipment, park landscaping, development of open space, walkways, and sidewalks, fencing, etc.;

- Allowances for contingencies and engineering in the amount of 10% of the estimated cost of services;
- H.S.T.
- The Developer shall provide the Township with written confirmation from the following utility authorities that satisfactory arrangements have been made for the installation of services in the proposed subdivision, at no cost to the Township:
    - Bell Canada;
    - Cable TV Company;
    - Canada Post;
    - Enbridge Gas;
    - Hydro One;
    - TC Energy;
    - Canada Post;
    - Any other Authority as required.

In addition to the above, Location Approvals shall also be submitted by the appropriate Utility Authorities. Where requested, easements shall be provided for utilities, at no cost to the Utility or Township.

- Proposed timetable for construction of services.
- Proposed Landscape Plan and/or Parkland Development Plan where required.
- Proposed phasing plans.
- Other information as required for the Subdivision Agreement.

2.3 Administration Fees, Securities and Development Charges

The administration fees, securities, and development charges applicable to subdivision development are stipulated in the Subdivision Agreement. Reductions in securities shall be considered in accordance with the provisions of the Subdivision Agreement. (A sample letter is included on the next page.)

Sample Letter - Request for Reduction in Letter of Credit

Date:

Township of Oro-Medonte

148 Line 7 South

Oro-Medonte, ON L0L 2E0

Attention: Manager of Development Engineering

Re: (Name of Subdivision) or (Site Plan Application)

On behalf of the owners of the above development, we are requesting your consideration and approval of a reduction in the amount of the letter of credit held by the Township as performance and maintenance security.

We have attached hereto a summary listing the value of the work completed to date, based upon the Schedule of Construction Costs included in the Subdivision Agreement, revised as noted to reflect **all** required alterations to the works. The current value of securities is calculated as follows:

1) Value of outstanding work $_____
   (inc. contingency, engineering fees and HST)
2) Maintenance Holdback $_____
   (10% of original securities)

Total $_____

We are also attaching a Statutory Declaration by the owner that **all** outstanding accounts relative to work in this subdivision have been paid.

Yours very truly,

(Signature of Engineer)

Name of Engineering Firm

2.4 Submission Requirements and Approvals

Introduction

This section outlines the required submissions to be made to the Township.
All submissions are to be coordinated by the Developer's Consulting Engineer.

The Developer's Consulting Engineer **shall deal directly with other commenting Authorities**, (i.e. County of Simcoe, Ministry of the Environment Conservation and Parks, Ministry of Northern Development, Mines, Natural Resources and Forestry, Department of Fisheries and Oceans, Ministry of Transportation, Lake Simcoe Region Conservation Authority, Nottawasaga Region Conservation Authority, etc.) for works that fall within their respective jurisdictions.

- The Developer's Consulting Engineer shall ensure that copies of transmittals for all documents, reports and design submissions to other agencies are included with the **same** submission version / date as sent to the Township of Oro-Medonte and are coordinated as such.

- It is the Developer's Consulting Engineer's responsibility to ensure that all correspondence and comments from all other agencies are to be provided to the Township of Oro-Medonte with the appropriate submission.

- Second and Final submissions shall not to be circulated, or shall they be accepted for review until the Township's and all other authorities' comments regarding the first or subsequent submission, respectively, have been received and incorporated. A Comments Matrix is to accompany the Second and all Subsequent submissions.

- Drawings for all submissions shall be in accordance with Township Standards and each submission shall be numbered (e.g. Submission 1, 2, or X) and include the date of submission.

2.4.1 Engineering Requirements for Draft Plan Approval

A Preliminary Engineering Report shall be submitted by the Developer's Consulting Engineer. This report shall be presented in a readable, comprehensive, and professional manner. The Report shall be signed and sealed the Developer's Consulting Engineer.

This Preliminary Report shall contain the following and be submitted to the Township by way of a Township accepted electronic submission method:

2.4.1.1 The Draft Plan

The Draft Plan shall be in compliance with the Planning Act, as amended, and in a form acceptable to the Development Services Department.

2.4.1.2 Contour Plan

This plan shall be at a scale of no larger than 1:1000 giving contour lines at sufficient intervals to permit assessment of existing surface drainage patterns. Contour intervals shall not be greater than 1.5 metres. This plan is to extend to 5 metres past the limits of the drainage area to be served by proposed sanitary and storm sewer systems, including lands beyond the boundaries of the subdivision. For large external drainage areas, separate Contour Plans at a larger scale may be provided. **All** elevations are to refer to Geodetic Datum.

2.4.1.3 General Plan of Services

The General Plan of Services shall be a plan based on the Draft Plan and shall schematically show the proposed storm and sanitary sewer systems and watermain and their connection to existing systems. Direction of flow shall be indicated on **all** sewers. This plan is to be accompanied by preliminary engineering calculations indicating the quantity of flows at the connection to existing systems and/or at proposed outfalls. Consideration shall be given to the whole catchment area to ultimately be developed. Blocks and easements for storm and sanitary sewers, stormwater management facilities and watermain systems shall also be shown.

Preliminary road profiles and area grading requirements shall also be identified in the Preliminary Report. Blocks of land for community mail centres shall be identified on the Draft Plan and the General Plan of Services.

NOTE: Proposed noise attenuation barriers are to be shown (as required).

2.4.1.4 Drainage Plan

When a natural drainage channel passes through and / or is affected by the construction of the subdivision, drawings shall be submitted to indicate the location and typical cross-sections of the existing channel and of any proposed changes. In general, creek diversions shall **not** be permitted **unless approved in advance** by the appropriate Conservation Authority. An erosion-sediment control plan shall be required. A preliminary Stormwater Management Plan and Report shall be required by the Township in accordance with the requirements outlined in this document. The Developer's Consulting Engineer shall submit an outline of the Silt Sediment and Erosion Control Plan in accordance with the requirements of these Standards.

All drainage designs shall be carried out in general compliance with the MECP Stormwater Management Planning and Design Manual (As Amended). Site specific stormwater management reports shall be consistent with **all** applicable background reports prepared by the Township or Conservation Authority (i.e., Watershed Planning Studies, Master Drainage Plans, Stormwater Management Master Plan, etc.), including the Lake Simcoe Protection Plan.

If the overland flow route travels across downstream property not municipally owned, the Developer shall obtain the necessary agreement(s) from downstream owner(s) accepting the increased quantity of runoff.

Any proposed modifications to an existing channel and/or floodplain shall (if applicable) require MNRF, MECP, LSRCA, NVCA or DFO review / approval.

The Developer's Consulting Engineer shall confirm the requirements with the appropriate agency(s) prior to proceeding with the preliminary engineering report.

2.4.1.5 Geotechnical and Soils Report

In new developments, the Developer shall engage a Geotechnical Consultant to prepare a report on the existing soil conditions which is to include:

- sub-surface soil and groundwater conditions and the ability of the soils to structurally support underground services, roadways, and foundations for residential, commercial, or industrial type structures.
- Determination of the elevation of seasonal high groundwater and comment on minimum foundation elevations to avoid buildings constructed below the groundwater table.
- The identification, description, and limits of the existing soil regimes, including the extent of topsoil and its suitability for reuse.
- The suitability of native materials for trench backfill.
- The conditions under which the native material may be used as trench backfill.
- The procedures to be used for high moisture contents and water table levels, which may affect the proposed servicing or structural works of the concerned area and surrounding lands.
- The extent of native material which is unsuitable for trench backfill and the procedure for dealing with it such that it shall **not** affect the structural stability of the proposed Township services.
- Areas and procedures to be followed where blasting may be required with due consideration to surrounding structures and services.
- The road material depths for pavement design.
- Special recommendations for bedding materials.
- Potential corrosive or chemical problems that may affect services or structures (e.g. high sulphates) and the method of resolving such problems.
- Recommendations in dealing with filling conditions within the road allowances, on building lands, in the construction of berms etc.
- Identification of problem areas and recommendations for mitigating procedures regarding existing slope stability and the extent of unstable soils conditions.

- Special recommendations to be followed in the design and construction of building foundations including recommended foundation elevations in relation to the groundwater elevation.
- The engineering properties of the native material including frost susceptibility, natural moisture content, compaction characteristics, relative density, and structural integrity.
- Recommendations for achieving proper compaction.
- Recommendations for dealing with deep excavation of trenches.
- Recommendations for dealing with septic or well systems that may be affected by the proposed building and servicing works.
- Confirmation that sufficient boreholes have been taken to establish definite requirements and recommendations for the servicing and building works. In general, the geotechnical report shall identify minimum bearing capacity of the native soil (i.e. 75 kPa) preferably on a hole-by-hole basis. Boreholes located in the area of proposed underground Township services are to be taken to a depth of at least one (1) meter below the deepest trench.
- Requirements and recommendations contained within this report along with borehole logs and grain size analysis of the native soils are to be incorporated by the Developer's Geotechnical Engineer into their first submission to the Township. Any such requirements and recommendations not incorporated are to be drawn to the Township's attention with specific reasons.

2.4.1.6 Hydrogeological Report – Rural Development

The proponents of a draft plan application that proposes individual water supply wells and sewage disposal systems shall provide a detailed Hydrogeological Report prepared by a qualified Hydrogeologist. This report shall relate to the soil types and their ability to physically accommodate private sewage disposal systems, the availability of potable groundwater supplies from the proposed water supply sources, the anticipated quantitative and qualitative impacts within the development and with neighbouring water sources, and proposed mitigative measures.

Preliminary on-site testing shall be reviewed with the Township and shall be sufficient to support the proposed residential density. Test wells shall be drilled and pump testing performed to carry out the hydrogeological investigation, in accordance with the latest MECP guidelines.

The proposed monitoring program, prior to, during and after construction shall be submitted by the hydrogeologist to the Township for review.

2.4.1.7 Watermains and Sanitary Sewers

Where watermains and sanitary sewers are proposed, comprehensive servicing reports shall be prepared and submitted to the Township. Available capacity in existing water treatment and sewage treatment plants shall be taken into consideration. Where public communal water systems are proposed the requirements of **Section 3.8** shall apply.

2.4.1.8 Traffic Impact Study

A Traffic Impact Study (TIS) may be required at the discretion of the Township, County and M.T.O., as applicable roads authorities

2.4.1.9 Noise Attenuation Report

A noise feasibility study or detailed noise study **may be** required to support the development proposal.

All reports shall follow the Ministry of Environment - Noise Assessment Criteria in Land Use Planning Publication LU-131.The Ministry of the Environment Conservation and Parks requires the use of the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) to assess the noise impact from existing roadways on planned residential land uses, to assess the noise impact of roadway projects, and to establish the ambient noise sources and for complaint investigation. A qualified Professional Engineer, with experience in environmental acoustics, shall certify implementation of noise control measures.

2.4.2 Engineering Submissions

All documents, drawings, reports, etc. required to be included in Engineering Submissions shall be provided by way of a Township accepted electronic submission method.

Copies of all Submissions to / Transmittals to / Correspondence with said Authorities shall be copied to the Township by email and / or copies of Applications and Approvals submitted directly to the Development Services Department, Development Engineering Division and Township's Engineering Consultant.

2.4.2.1 First Engineering Submission

Letters of Retention

- A Letter of Retention to the Township from the Developer's Consulting Engineer for the design and complete general construction inspection of **all** municipal services.
- A Letter of Retention to the Township from the Developer's Electrical Engineer for the design and construction inspection of **all** streetlight works.
- A Letter of Retention from the Developer's Geotechnical Engineer for the inspection and certification ensure that the geotechnical operations are in compliance with the Township's specifications.
- A Letter of Retention to the Township from the Developer's Landscape Architect for the design and inspection of **all** streetscape and stormwater facility plantings and Parkland Development.

Reports and Studies

In each instance, the following Reports shall be required in digital form by way of a Township accepted electronic submission method.

- Functional Servicing Report.
- Stormwater Management Report and storm sewer calculations on standard design sheets.
- Sanitary design calculations on standard design sheets.
- Geotechnical Report.
- Hydrogeological Report.

- Water supply and distribution report providing calculations to support the design of the distribution works including main sizes, fire flows and anticipated flows and pressures for domestic and other users.
- Traffic Impact Study and Analysis Report (if required).
- Environmental Impact Study (if required).
- Natural Heritage Evaluation (if required).
- Noise Attenuation Report (if required).
- Arborist Report (if required).

In addition to the above listed reports, the following shall also be provided:

- Archaeological Assessment (if required).
- Photometric Calculations (if required).
- A letter from the Developer's Geotechnical Engineer, summarizing the contents of the submission and certifying the design conforms to the Township of Oro-Medonte Development Engineering Policies, Process and Standards.
- **All** other reports as required by the Draft Plan Conditions / Approval.

Drawings

In each instance, the following Drawings shall be required in digital form by way of a Township accepted electronic submission method:

- Title Page
- Proposed Legal Plan for Registration - showing **all** lot, block and proposed easement numbering and dimensions for Land Conveyance
- General Servicing Plan(s)
- Overall Site Grading Plan(s)
- Preliminary Lot Grading Plan(s) – As Per the Overall Site Grading Plan(s)
- Stormwater Drainage Design
- Stormwater Retention Pond Design
- Sanitary Collection Design
- Water Distribution Design
- Plan and Profile Drawings

- Erosion, Sediment and Silt Control Detail Drawings
- Standards and Special Details Drawings
- Landscape Plan and Details

Municipal Structures Submission

When a new roadway structure (i.e. bridges, culverts, water crossings) is proposed, a specific submission related to the structure is required, which includes the following information:

- the General Arrangement drawing(s), prepared in general accordance with the MTO Structural Manual. The General Arrangement Plan shall include the roadway structure plan, profile, elevation, and cross sections.
- the Design Report which includes but is not limited to the description of the works, how the detail was arrived at, different options and cost analysis/least expensive alternate.
- the Design Criteria Sheet which shall include (but is not limited to): the type/class of roadway, volume of traffic, geometric information, and cost estimate.
- the Geotechnical Report.
- the Hydrology Report.
- A letter from the Professional Engineer responsible for the design and which certifies that:
  - The bridge type, length and width are appropriate;
  - HBDC requirements are met;
  - Ministry standards have been followed;
  - The most economical life cycle cost solution has been selected for the site;
  - Canadian Highway Bridge Design Code has been adhered to.
- The structural design drawings and details included as part of the Subdivision Agreement shall be stamped and signed by the Engineer who designed the roadway structure and by the professional engineer who check the structural design drawings.

2.4.2.2 Second Engineering Submission

The following plans and documents, as a minimum, are required for the second submission:

- A Detailed chart or report with **all** the First Submission "red lined" comments and how they have been met in the form of a Comment Matrix.
- **all** other applicable approval agencies comments.
- **all** revised drawings, proposed M- and R- Plans.
- Ministry of Environment Conservation and Parks Environmental Compliance Application (ECA), signed and submitted by the Developer and the Developer's Consulting Engineer.
- Alterations to existing municipal infrastructure must follow the requirements as prescribed in the Township's Consolidated Linear Infrastructure ECA (CLI ECA), the applicable MECP prescribed forms must be provided.
- the Subdivision Agreement Schedules Pertaining to Engineering Submission.
- the **Preliminary Utility** Coordination Plan.
- the **Preliminary Electrical** Design and Streetlight Design Plan(s)
- the **Preliminary** Engineering Cost Estimate for **all** proposed works.

NOTE: Subsequent Submissions shall be made, as required, until the drawings and designs are acceptable to the Township and required Agencies.

2.4.2.3 Final Engineering Submission

The following plans and documents shall be compiled and submitted in their entirety by the Developer's Consulting Engineer in one complete package. Incomplete submissions, delivered to the Township, shall be returned immediately.

A complete submission set of the Engineering Drawings, Reports, Approvals, Cost Estimates, Insurance Certificates, and Agreements / Acknowledgements shall be submitted by way of a Township accepted electronic submission method and in accordance with the following Township requirements:

- The Accepted for Construction digital drawing file shall be georeferenced. The standard coordinate system for Oro-Medonte is Universal Transverse Mercator

(UTM) Zone 17 with the North American Datum 1983 (NAD83). The drawing units for all features shall be in metric, set to metres and un-scaled (1:1).

The following constitutes a complete submission set as per above:

- the Proposed M-Plan and R-Plan.
- the complete set of **all** drawings listed in the Subdivision Agreement, stamped and signed by the Developer's Consulting Engineer and/or Landscape Architect (where applicable).
- Stormwater Operation and Maintenance Manual
- **all** required agency approvals - MECP, MTO, MNRF, NVCA, LSRCA, etc.
- A Detailed Engineering Cost Estimate of **all** proposed works.
- the Developer's Insurance Certificate naming the Township and the Township Engineering Consultants as co-insured, as per the Subdivision Agreement.
- Approved Designs and/or evidence of written agreements with Hydro One, Bell Telephone Company, Enbridge Gas, and Cable TV Provider for the installation of utilities in a common trench in the prescribed locations on road allowances within the plan of subdivision.
- Approved Designs and/or writing that agreements are in place with Hydro One or any other approved Contractor for streetlighting installation.
- Approved Designs and/or evidence in writing that satisfactory arrangements are in place with Canada Post for the location of mailboxes.
- A summary of lot area and frontage for each Lot / Block to confirm compliance with the Township Zoning By-law, prepared by an O.L.S.

- **NOTE 1:** Submissions shall include the items listed above and submitted in their entirety by ONE (1) agent of the Developer in ONE (1) complete package. Incomplete submissions, delivered to the Township, shall be returned.
- **NOTE 2:** Upon completion of servicing construction, the Developer's Consulting Engineer shall revise the original drawings with field information and submit As-Constructed drawings.

- **NOTE 3:** No Pre-servicing is permitted including topsoil stripping, blasting, tree removal or underground servicing works until **all** drawings and agreements have been approved and signed unless a Pre-Servicing Agreement has been entered into.
- **NOTE 4:** Submission of the Accepted for Construction General Servicing Plan and Utilities Coordination Plan shall be provided by way of a Township accepted electronic submission format to the Environmental Services Department. The digital drawing file shall be georeferenced. The standard coordinate system for Oro-Medonte is Universal Transverse Mercator (UTM) Zone 17 with the North American Datum 1983 (NAD83). The drawing units for all features shall be in metric, set to metres and un-scaled (1:1).

2.4.2.4 Parkland Development and Landscaping / Streetscaping

A covering letter from the Developer's Consulting Engineer or Landscape Architect stating the landscape work is in conformity with the proposed grading and Township services for the development, plus an outline of the items contained within the submission.

- One (1) copy of the following drawings (where applicable):
  - Existing Natural Features Assessment
  - Tree Survey/Vegetation Analysis and Tree Preservation Plan
  - Streetscape and Buffer Planting Plans
  - Detailed Parkland Development Plans
- Stormwater Management Pond Planting Plan

The Developer may request jointly obtaining a Landscape Architect with the Township with all costs borne by the Developer.

2.5 Conditions of Construction

2.5.1 Requirements for Pre-Construction Meeting

The Developer's Consulting Engineer shall schedule a Pre-Construction Meeting to be held on / at the development site.

The Developer's Consulting Engineer shall provide to the Township and the Township's Engineering Consultant the following in digital form by way of a Township accepted electronic submission method:

- WSIB Clearance Certificate
- Ministry of Labour Notice of Project
- Contractors Insurance Certificate
- Site Health and Safety Plan
- Identified and Approved Haul Routes to Site and Traffic Control (On Site) Plan
- Materials Storage and Spill Response Plan
- MECP, MNRF, NVCA, LSRCA and/or DFO work permits and approvals (as required)
- 24 Hr Emergency Contact information
- Contact information for all relevant parties: Owners, Consultants, Contractors, Township, Fire and Emergency Services, OPP, Hydro 1, etc.
- The proposed Contractor and Subcontractors.
- The Contractor's list of suppliers.
- Project Schedule of Servicing Works
- Two (2) full sized paper copies of the Approved for Construction Drawings Set
- **All** other information specified in the Subdivision Agreement as a requirement prior to commencement of construction or other information required by the Township.

2.5.2 Commencement of Construction

Construction of services shall not commence until the Developer has entered into the necessary agreements with the Township of Oro-Medonte. The Developer shall also have obtained the required approvals from the County of Simcoe, the Ministry of Transportation Ontario, the Ministry of Environment Conservation and Parks, or other agency or authority that may be affected by the plan of subdivision.

2.5.3 Commencement Notice

The Manager of Development Engineering shall be given forty-eight (48) hours written notice prior to the commencement of construction. Should there be a cessation of construction of more than one (1) week; the Developer shall again supply forty-eight (48) hours written notice prior to recommencing the work. Failure to comply with any portion of these requirements may lead to increased maintenance periods.

2.5.4 Blasting or Tunnelling

No blasting or tunnelling shall take place without written approval of the Manager of Development Engineering.

2.5.5 Winterizing of Subdivisions

In order to minimise repairs to new subdivision roads and snow plowing equipment, the Township requires the following works to be carried out prior to November 15th of each year:

- Manhole tops, catchbasin frames and valves on roads with base asphalt shall be set at the level of the base course asphalt.
- Settlements in roadways shall be repaired, particularly adjacent to manhole tops and catchbasin frames.
- Sidewalk bays, which have settled and created a lip greater than 10mm shall be repaired.
- **All** asphalt roads, emergency accesses and loose surface roads identified by the Fire Department and / or the Manager of Development Engineering shall be cleared of mud and debris, have a minimum of one full lane open **at all times** and maintained in this manner throughout the maintenance period.
- Inlet manholes, catchbasins, ditches or channel shall be cleared of debris to prevent blockages during winter and spring thaws.
- All Fire Hydrants shall be kept clear of snow, debris and soils and a Hydrant Marker shall be affixed for location identification.
-

2.5.6 Hours of Work by Contractors

The hours of work pursuant to the Township of Oro-Medonte Noise By-Law 2012-167 (Office Consolidation July 16, 2015 – As amended by By-laws 2015-109 and 2015-130) shall be: **6:00 a.m. To 10:00 p.m.**

These time restrictions are for **all** construction activities including (but not limited to) delivery of materials and equipment, starting, idling and warming of equipment, excavation, blasting, removal or moving of materials on site, etc.

2.5.7 Access to Township Roads

Every individual property finds its legal access to public roads by means of sufficient frontage on an assumed public roadway, or by deeded access over property having frontage.

- An Improved Residential Property, fronting on an assumed Township road may have **only one (1)** entrance, approved prior to a building permit being issued.
- An entrance permit onto a Township road shall be secured by means of, a permit application, a site plan or by a plan of subdivision.
- Vehicular entrance onto or egress from an assumed Township road is not permitted except at an approved entrance.
- Temporary access may be granted under the permit application.
- **All** entrances onto a Township Road shall be installed and maintained by and at the cost of the property Developer.
- The Developer shall maintain **all** entrance improvements on Township property in a safe condition. The Township may, with appropriate notice, make improvements to, or remove, unsafe entrance features at the Developer's cost.

2.5.8 Directional / Informational Signage

The Developer is responsible to erect and maintain the directional / informational signage to **all** works commencing and until Final Acceptance and Assumption by the Manager of Development Engineering or otherwise directed by the Township.

An information sign shall be placed at every access point to the subdivision detailing: the developer, the general contractor, and the Developer's Consulting Engineer. Phone numbers for each of these companies shall be posted on this sign.

2.5.9 Mud, Dust, Stockpile & Debris Control

The Township shall be satisfied that proper arrangements have been made to assure that **all** nuisance dust, mud and debris shall be properly cleaned on a regular basis.

The Developer is required to keep subdivision lands, internal roadways, and adjacent roadways free from nuisance mud and dust **at all times**.

Roads are to be scraped daily or when mud accumulates, which is ever greater. The road is to be flushed and / or swept a minimum of once per week or more if required to assure dust and mud does not become a nuisance or unless otherwise directed by the Township and **all** scattered debris is to be cleaned **daily**.

Roadways are not to be used for stockpiling materials once the road is open to public use. If a road is to be blocked for more than two (2) minutes in duration with construction equipment, then an alternative signed detour route shall be established as per O.T.M. – Book 7 requirements.

2.5.10 Construction on Existing Roads

Whenever it is necessary to cut through an existing Township or County Road, the contractor shall be responsible for proper compaction of the backfill material and replacing the original surface to an equal to or better condition.

Road Occupancy and **Road Closure** permits **shall** be obtained **prior** to undertaking **any** work on an existing road allowance from the relevant Road Authority.
It is the developer's responsibility to provide the Manager of Development Engineering a minimum of forty-eight (48) hours notice prior to commencing work so that Fire and Emergency Services and School Boards (as required) can be given advance notification. The road shall be maintained to a minimum of one lane for emergency access.

In the event of an unexpected closure, notice shall be given to the Township **immediately. All** signage and detours shall conform to the latest version of the Uniform Traffic Control Manual.

After roads within a plan of subdivision have been paved with top course asphalt, **no** cutting of the asphalt shall be allowed to install services for a period of three (3) years. Any Contractor installing a service shall require a **Road Occupancy Permit** from the Township, even though the roadway remains the Developer's responsibility for maintenance.

Unshrinkable fill (as per O.P.S.S. 1359) may need to be utilised as the backfill material from top of cover material to the frost line, in trench installations within Township road allowances, depending on native soil conditions. On top of the unshrinkable fill, the trench shall be restored with Granular 'B' to the bottom of the Granular A (a minimum of 150mm of Granular A is required) in accordance with existing road structure composition.

Where overlaying or constructing new road works, a diagonal joint shall be utilised across the travelled portion of the roadway.

Where proposed road granular material differs from existing road granular material, a frost taper shall be utilised to minimise the effects of different granular characteristics.

NOTE: Subdrains shall remain intact and at grade during these restorations.

2.5.11 Existing Infrastructure

In general, the Developer may be required to design and construct upgrades to existing infrastructure or new infrastructure outside the limits of the proposed development, to support the development, including but not limited to sewer works, water works, drainage and stormwater management, parkland, roads, and sidewalks. All costs shall be solely at the Developer's expense.

During construction the Developer shall be responsible to protect **all** adjacent infrastructure and make repairs to any damage as a result of construction of the development.

2.5.12 Site Restoration

In **all** cases the subdivision lands shall be restored and maintained to a condition such that they are kept free of nuisance debris, mud, and dust at **all** times. In the event of a period of 90 consecutive days of inactivity, the site stability and / or remediation shall be undertaken to the satisfaction of the Township.

Where earth excavation, brush, muck, stumps, etc. are to be removed from site, they shall be disposed of in accordance with the latest MECP approved regulations (at an approved dump site or landfill location).

In **all** cases, the ditches, side-slopes, and banks shall be restored to a condition satisfactory to the Township. In both urban and suburban areas this shall include topsoil, sod or seed with proper after-care of **all** land on the R.O.W. disturbed during the construction of the road.

Unless otherwise approved, no earth ditch or embankment shall have a slope greater than 3:1 run/rise. Where required in the opinion of the Township, a significant structure or special slope stabilizing procedures may be required.

All rock faces left exposed in cut shall be cleared of loose rock debris. The earth shall be cut back from the top of the rock by a minimum of 0.5m.

2.5.13 Timing of Paving

Paving between **October 31st and May 15th shall not be accepted** without prior approval of the Manager of Development Engineering and satisfactory documentation provided by the geotechnical inspector as to temperature and weather conditions. **Any** paving done between these months without prior approval **shall** be removed and replaced at the Developer's expense.

2.5.14 Landscaping / Streetscaping Implementation Procedures

2.5.14.1 Landscaping / Streetscaping Works

The Developer is required to hire a contractor to install the landscape / streetscape elements called for in the approved landscape / streetscape plans.

The Developer's Landscape Architect shall inspect the work, report on progress to the Township and provide the Township with As-Constructed drawings.

An important part of the Landscape Architect's duties shall be to maintain a Summary Chart documenting the history of each new tree planted on each parcel of land being

developed, including each Lot tree required. At the appropriate time(s), the Township shall conduct its own inspections.

2.5.14.2 Naturalization Works

As with streetscape works, the process begins with the developer hiring a contractor to install the landscape elements called for in the approved Landscape Plan(s). The Developer's Landscape Architect shall supervise the work and report on progress to the Township. At the appropriate times, the Township shall conduct its own inspections.

2.5.14.3 Maintenance of Naturalization Areas

Carrying out maintenance programs after planting the naturalization areas significantly reduces the mortality rate of the trees, shrubs, grasses, etc. and helps to establish healthy vegetative cover.

At the time of planting, the planting details and specifications shall be followed faithfully. This means, among other things, the proper transportation and handling of plant material, the use of fertile planting soil, the proper staking of trees and the proper installation of rodent protection.

Maintenance shall include:

- apply appropriate fertilizer to promote growth
- prune dead or diseased tissue
- remove dead plant material as necessary
- replace dead coniferous or deciduous naturalization species to maintain a minimum live-stocking standard of 90%
- suppress weed growth around new trees and shrubs by adding mulch and/or removing weeds by hand. Weeds shall not be cut down with a power trimmer.
- An assessment of plant material shall be carried out annually by the Landscape Architect between mid-July and early September and reported to the developer, contractor, and Township in the form of a Naturalization Assessment Report. Plant vigour shall be determined by visual inspection of the current year's foliage.

- The initial inspection and assessment shall be conducted in the summer following the planting. It shall take account of the survival and condition of the plants. It shall also include a summary of the maintenance operations performed. Finally, the assessment shall propose **all** additional maintenance measures necessary, and recommend where, the following spring, plants need to be replaced or new plants added.
- The second assessment shall be conducted the following year and shall provide similar information to the first.
- The third and final assessment shall take place just prior to assumption. The final report shall provide a complete summary of the initial plantings, as well as a record of the replacements and maintenance services carried out during the guarantee period. The report shall also make note of **all** additional work that shall be performed prior to the Township conducting a final inspection.

2.6 Construction Inspection and Reporting

2.6.1 Inspections

In addition to fulfilling an inspection role for construction, the Developer's Consulting Engineer shall serve as liaison between the Developer and the Contractor, as well as between the Developer and the Township. They are to ensure the approved design intent is implemented, to expedite design decisions on site, and to deal with homeowner enquiries and concerns.

The Developer's Consulting Engineer **shall** have their own Site Inspector on site during **all** grading, construction, and servicing works. The Site Inspector shall, at a minimum, have obtained a C.Tech designation with OACETT or an equivalent pre-approved by the Manager of Development Engineering. The Developer's Consulting Engineer shall submit a résumé of the Site Inspector(s) for Township approval.

If at any time, in the opinion of the Township, the Site Inspector(s) is under qualified, the Developer's Consulting Engineer shall replace them with one satisfactory of the Township.

It is the responsibility of the Developer's Consulting Engineer to determine which works are complete and in compliance or which require repair to meet compliance with the Township Standards. The Manager of Development Engineering or their representative shall meet on site with the Developer's Consulting Engineer and review the works to determine what is compliant or non-compliant; the Manager of Development Engineering or their representative shall only give approval to proceed to the next stage of works once the infrastructure is compliant.

Any work that proceeds prior to approval from the Township shall **not** be accepted and may be required to be removed and / or replaced and / or additional warrantee periods may be added beyond those specified in the Subdivision Agreement.

At the pre-construction meeting, the Developer's Consulting Engineer and Geotechnical Engineer shall be required to provide the Township with a schedule of the works, together with the names & emergency phone numbers of **all** inspectors to be on site during the construction of the various phases of the works.

The Township shall have the right to inspect the installation of works and services to ensure they are being constructed in accordance with Township Standards. Where the Manager of Development Engineering or their designate have reason to believe the work is not being done to the required standard the work shall be stopped until further notification to proceed from the Manager of Development Engineering. The Township may charge a fee for such inspection services.

2.6.2 Inspection Reports

Weekly inspection reports from the Developer's Consulting Engineer shall be submitted to the Manager of Development Engineering at the end of each month for review. If the reports are not submitted within 10 days of the end of the month, the Township may place a Stop Work Order on the project until the Township is satisfied that works are in accordance with Township Standards and those of other authorities.
The diary shall at a minimum contain the following information:

- Weather Conditions.

- General Progress of work; where the Contractor is working and what work is being done.
- Equipment being moved or arriving on the job site and its purpose.
- Visits to the site by Township or County Officials and **all** specific instructions they may have given.
- Instructions given to the contractor.
- Contractor's claims or complaints.
- Compaction efforts for trench backfill, granular road bedding and asphalt.
- Trench conditions.
- **All** discussions or dealings with property owners.
- Work performed on the site involving the installation of public utilities.
- The actual hours worked
- The actual area of work
- The time of arrival and departure of the Developer's Consulting Engineer or their Inspector.
- **All** pertinent information relating to Quality Assurance of the works.
- **All** erosion and sediment control devices shall be inspected once per week and after each rainfall of 1 cm or greater to ensure that they are in proper working condition.

2.6.3 Geotechnical Inspections and Reports

In new developments, the Developer shall engage a licensed Geotechnical Engineer to prepare an inspection report on the identification, description and placement of **all** engineered materials used throughout the development.

Those materials are (but not limited to):

- native materials for trench backfill
- trench bedding and backfill materials used on site from supply sources
- road construction materials (granular and asphaltic cement)
- concrete used for curbing, sidewalks, and structural construction
- asphalt and granular materials used for walkways / trailways

During Construction:

- The Developer shall retain the Geotechnical Engineer who prepared the inspection to inspect the installation of bedding and the back filling of **all** trenches within road allowances and easements. The trench backfill certification is required to indicate that sufficient tests have been carried out to obtain an Inspector's report as to the compaction of the backfill and that the backfill is found to be in compliance with Township specifications and requirements.
- The final subgrade certification is to confirm that the final subgrade conditions are equal to or better than those anticipated in the preparation of the pavement design. The above certification(s) shall display the Professional Engineer's Stamp of the Developer's Geotechnical Consultant. The certification is to include the following wording: "This certification has been made to the best of the Developer's Geotechnical Consultant's knowledge and information. This certification however does not relieve the Contractor, the Developer or any other parties of their respective responsibilities pertaining to maintenance or otherwise."
- The findings of the compaction reports and the aforementioned certification are to be forwarded to and acknowledged by the Township prior to placement of the granular road material. The Developer's Geotechnical Consultant shall also confirm that the final subgrade conditions are at least equal to those anticipated in their preparation of the pavement design. If these conditions are less than what was anticipated, the Developer and the Township are to be immediately advised with a new pavement design recommendation.
- Where grading operations require the placement of "engineered fill", the Developer's Geotechnical Engineer shall certify that the fill located at 1.0m below finished grade and deeper has been sufficiently compacted to assure a minimum bearing capacity of 75 KPa and a 98% Standard Proctor Density as per O.P.S.S. 514.07.08 regarding back filling and compaction within road allowances and lots where fill exceeds 1.0m in thickness is strictly adhered to.
- Identify problem areas and recommend mitigating procedures regarding the stability of existing slopes and the extent of unstable soils or conditions.

2.6.4 Standards and Maintenance

All work shall be to the satisfaction of the Manager of Development Engineering. **All** work shall be designed and constructed in accordance with the most recent requirements, Township Standards, Specifications and By-laws of the Township of Oro-Medonte. **All** Works constructed shall be guaranteed for such period of maintenance as required hereinafter.

2.7 Substantial Completion, Initial Acceptance and Maintenance, and Final Acceptance and Assumption

2.7.1 Substantial Completion

Substantial Completion shall be issued when the Municipal Servicing Works comprised of all **Underground Services** (defined in Section 1 – Definitions: Substantial Completion) constructed / installed by the Developer as per the Subdivision Agreement have been completed, inspected and certified to the satisfaction of the Township, Township's Development Engineering Department and / or Engineering Consultant, and the Developer's Consulting Engineer, a Certificate of Substantial Completion – Underground Services shall be issued by the Township.

A Request for Inspection of Underground Services is required to initiate the inspection process.

2.7.1.1 Inspection(s) for Substantial Completion

Upon completion of the Underground Services the Developer's Consulting Engineer shall make request to the Township to carry out an **Inspection for Substantial Completion – Underground Services** in conjunction with Developer's Consulting Engineer. **All** deficiencies found during this inspection shall be immediately corrected by the Developer. This inspection is for the benefit of the Township and shall not relieve the Developer of their obligations under the Condominium Act and Site Plan Agreement.

2.7.1.2 Certification for Substantial Completion

Upon completion of the **Substantial Completion** inspection(s)**,** the Developer's Consulting Engineer shall provide written certification to the Township that the Municipal Underground Services have been constructed in accordance with the approved plans

and specifications and in accordance with good engineering practices. The wording is to be followed by the Professional Engineers stamp and signature.

2.7.1.3 Certificate of Substantial Completion

Upon the receipt of certification by the Developer's Consulting Engineer that **all** of the Municipal Servicing Works pertaining to Substantial Completion have been constructed in accordance with approved plans and specifications and in accordance with good engineering practices and following the inspection and acceptable conditions of works, the Township shall issue the Certificate of Substantial Completion to a point of completion being the completion of storm drainage works (including culverts, storm sewers and detention pond), waterworks, sanitary works, underground electrical distribution system, energized streetlighting, natural gas distribution, telephone and cable television distribution, base course asphalt, and temporary signage.

NOTE: Building Permits **shall not** be issued until the **Certificate of Substantial Completion** has been issued.

2.7.2 Initial Acceptance and Maintenance

Initial Acceptance and Maintenance shall be issued when the Municipal Servicing Works comprised of all **Underground and Aboveground Services** (defined in Section 1 – Definitions: Underground Services and Aboveground Services) constructed / installed by the Developer as per the Subdivision Agreement have been completed, inspected and certified to the satisfaction of the Township, Township's Development Engineering Department and / or Engineering Consultant, and the Developer's Consulting Engineer, a Certificate of Initial Acceptance and Maintenance shall be issued by the Township.

A Request for Inspection of Initial Acceptance and Maintenance and Maintenance is required to initiate the inspection process.

2.7.2.1 Inspection(s) for Initial Acceptance and Maintenance

Upon completion of **all** Underground and Aboveground Services, the Developer's Consulting Engineer shall make request to the Township to carry out an **Inspection for**

Initial Acceptance and Maintenance in conjunction with Developer's Consulting Engineer. **All** deficiencies found during this inspection shall be immediately corrected by the Developer. This inspection is for the benefit of the Township and shall not relieve the Developer of their obligations under the Condominium Act and Site Plan Agreement.

2.7.2.2 Certification for Initial Acceptance and Maintenance

Upon completion of the **Initial Acceptance and Maintenance** inspection(s)**,** the Developer's Consulting Engineer shall provide written certification to the Township that **all** Municipal Underground and Aboveground Services have been constructed in accordance with the approved plans and specifications and in accordance with good engineering practices. The wording is to be followed by the Professional Engineers stamp and signature.

2.7.2.3 Certificate of Initial Acceptance and Maintenance

Upon the receipt of certification by the Developer's Consulting Engineer that **all** of the Municipal Servicing Works pertaining to Initial Acceptance and Maintenance have been constructed in accordance with approved plans and specifications and in accordance with good engineering practices and following the inspection and acceptable conditions of works, the Township shall issue the Certificate of Initial Acceptance and Maintenance, at which time the **minimum** two-year (2 year) maintenance period for Municipal Servicing Works shall commence.

NOTE 1: During the maintenance period, the Developer shall be responsible for **all** of the normal operation, maintenance and repairs for the services noted in the Certificate. If, during the two (2) year maintenance period, the Developer fails to carry out the repair works as required by the Township, then the Township **may** carry out the works and shall be reimbursed the cost of the works from the Developer's securities.

NOTE 2: During the maintenance period, should substantive repairs or replacement of municipal services be required, the maintenance period may be extended to accommodate the need to assess the repairs undertaken.

2.7.3 Maintenance Period

The Developer shall satisfactorily fulfill a minimum Two-year (2 year) Maintenance Period after the issuance of the Certificate of Initial Acceptance and Maintenance prior to the consideration of Final Acceptance and Assumption.

The required maintenance shall include **all** Winter Road Maintenance (Typically Subdivision Agreement – Schedule J) required to ensure safe access and egress to the development by residents, emergency services, contractors, the Township, etc. up to Final Acceptance and Assumption of the development by the Township.

During the 2-year (2 year) Maintenance Period, should the extensive maintenance to or failure and replacement of the municipal servicing works be necessary and, in the opinion of the Township, this maintenance, repair or replacement be such as to amount to equivalent of new works, the maintenance period **may** be extended for up to 2 (two) additional years on some or all of the servicing works stipulated in the Subdivision Agreement.

2.7.4 Final Acceptance and Assumption

Final Acceptance and Assumption shall be issued when the Municipal Servicing Works comprised of **all** Underground and Aboveground Services (defined in Section 1 – Definitions: Final Acceptance and Assumption) and all other works being constructed / installed by the Developer as per the Subdivision Agreement have been completed, have satisfactorily fulfilled the **minimum** Two-year (2 year) Maintenance Period, and been inspected and certified to the satisfaction of the Township.

2.7.4.1 Inspection(s) for Final Acceptance and Assumption

All Servicing Works listed shall require a Request for Inspection. This Inspection shall be undertaken in conjunction with the Township's Development Engineering Department, Environmental Services Department, Operations and Capital and Parks and Community Services, (as required) the Township's Engineering Consultant and the Developer's Consulting Engineer providing the Certification of Servicing Works. After the Inspection(s) and any resulting remediation has been completed, the passing of a

By-law to assume the municipal servicing works by Township Council and a Certificate of Final Acceptance and Assumption issued by the Township.

2.7.4.2 Certification for Final Acceptance and Assumption

Upon completion of the **Final Acceptance and Assumption Inspection** with the Township, the Developer's Consulting Engineer shall provide written certification to the Township that **all** Municipal Services have been constructed in accordance with the approved plans and specifications and in accordance with good engineering practices. The wording is to be followed by the Professional Engineers stamp and signature.

2.7.4.3 Certificate of Final Acceptance and Assumption

Upon the receipt of certification by the Developer's Consulting Engineer that **all** of the Municipal Servicing Works pertaining to receipt of the Developer's request for an **Inspection for Final Acceptance and Assumption** of the municipal services, the Township's Development Engineering Department and / or Engineering Consultant shall again inspect the work and if satisfied, shall recommend to Council that the **Certificate of Final Acceptance and Assumption** of Municipal Services be issued.

NOTE 1: The **Certificate of Final Acceptance and Assumption** of the Municipal Services can be applied for by the Developer after a **minimum** of two (2) years from the receipt of the Certificate of Substantial Completion and Maintenance.

NOTE 2: Security for **all** Landscaping / Streetscaping Works shall be held by the Township until the issuance of the Certificate of Final Acceptance and Assumption.

NOTE 3: Notwithstanding anything hereinafter set out, the Township **shall not** be obligated to assume the responsibility for and take over **any** or **all** subdivision services until seventy per cent (70%) of the lots in the subdivision or phase of the subdivision and have completed dwellings erected therein, Occupancy Permits have been issued and final lot grading approval has been certified.

SECTION 3 – DESIGN STANDARDS

3.1 Drawing Index

NOTE: Drawings pertaining to each of the following sections are found at the end of each respective section.

Section 3.2 Engineering Design and Drawing Requirements

- **3.2-01 Standard Title Page**
- **3.2-02 Standard Plan Sheet**
- **3.2-03 Standard Line Type, Layers and Symbols**

Section 3.3 General Servicing Plans

- **3.3-01 Service Location – Single Family Residential**
- **3.3-02 Service Location – Semi Detached Residential**
- **3.3-03 Service Location – Freehold Townhouse Units**
- **3.3-04 Service Location – Commercial, Industrial and Multi-Residential**
- **3.3-05 Notes - Construction**

Section 3.4 Overall Site Grading Design and Construction

Refer to 3.2-02 Standard Plan Sheet

Section 3.5 Road Classification and Design

- **3.5-01 Urban Residential**
- **3.5-02 Local Residential**
- **3.5-03 Cul-de-Sac Urban Residential**
- **3.5-04 Cul-de-Sac Local Residential**
- **3.5-05 Temporary Turn Around - Urban Residential**
- **3.5-06 Temporary Turn Around - Local Residential**
- **3.5-07 90^{O} Bulb Detail**
- **3.5-08 Local Collector and Industrial**
- **3.5-09 Cul-de-Sac Industrial**
- **3.5-10 Major Collector and Industrial**

3.2 Engineering Design and Drawing Requirements

Introduction

The purpose of this section is to outline the minimum design requirements for the construction of municipal services in the Township. These requirements are intended to provide guidance to the designer and do not relieve the Developer and their Consulting Engineer of the responsibility for submitting a completed product demonstrating competent engineering design in full compliance with **all** applicable legislation (as amended) and/or industry best management practices. In cases of discrepancy, the more stringent standard shall prevail.

Any deviation from the minimum Township Standards shall be specifically referred to by the applicant and/or their agent with a copy of written approval of the Township attached.

3.2.1 Specifications for Engineering Drawings

Size: Drawings to be Metric Standard A1 (594 mm x 841 mm) or Imp. Equivalent

Format: Same as Township standard sheets unless otherwise approved.

Materials for Preliminary Submissions:

- A digital copy by way of a Township accepted electronic submission method.

Materials for Final Submission and As-Constructed Drawings:

- Bond for Final Submission
- Bond for As-Constructed
- Black Ink (permanent)
- A digital copy by way of a Township accepted electronic submission method.

3.2.2 General Drawing Requirements

All engineering drawings shall be prepared in metric and in a neat and legible fashion. The design information presented on these drawings shall be completed in ink.

The standard Township of Oro-Medonte title block as shown in the detail drawings shall be used on **all** engineering drawings. A title sheet is required for the engineering drawings.

- Storm and Sanitary Drainage Area Plans may be prepared on a paper size other than Metric Standard A1 in order for the entire drainage system to be presented on one sheet.
- The lot numbering and block identification on **all** engineering drawings shall be the same as shown on the Registered Plan for the area.
- **All** elevations shown on the engineering drawings are to be of geodetic origin (stating NAD 1927 or NAD 1983). Aerial photo interpretation methods for securing existing contours and elevations shall not be accepted by the Township for base plan information on engineering drawings. A local benchmark (stating NAD 1927 or NAD 1983) note shall appear in each drawing.
- **All** plan and profile drawings are to be prepared so that each road can be filed separately. The road names shall be identified on the plan portion of the drawings.
- When roads are of a length that requires more than one drawing, match lines are to be used with no overlapping of information.
- The reference drawing numbers and centreline stations for **all** intersecting roads and match lines shall be shown on **all** plan and profile drawings.
- A north arrow and key plan shall be included on the top right-hand side on **all** drawings.
- **All** engineering drawings shall be stamped by a Professional Engineer. The Engineer's stamp shall be signed and dated.
- The drawings are to be stamped **Accepted for Construction** and signed by the Manager of Development Engineering or designate prior to the issuance of drawings for construction.
- **All** Landscape Plan drawings shall be stamped by a certified Landscape Architect.
- Existing information shall be shown light or background line weight. Proposed information shall be shown bold or foreground line weight.
- In general east-west roads shall have zero chainage at their westerly limit and north-south roads shall have their zero chainage at their southerly limits. The

intersection of centrelines of roads shall be used as zero chainage. Chainage on a plan-profile shall increase from left to right.

3.2.3 Computer Aided Drawings (CAD)

All Drawings shall be prepared using the Township of Oro-Medonte Standard CAD Format.

The Engineering Design Drawing file(s) shall be georeferenced. The standard coordinate system for Oro-Medonte is Universal Transverse Mercator (UTM) Zone 17 with the North American Datum 1983 (NAD83). The drawing units for all features in the file shall be in metric, set to metres and un-scaled (1:1).

The Township's Standard Symbol, Line Type, Line Thickness and Layering Scheme shall be followed for **all** Drawings. The line work shall be distinctive, easily readable and the lines' thickness shall accurately represent the width of the infrastructure that it represents (i.e. line thickness for sewers shall be drawn to represent the width of the Outside Diameter of the pipe).

Electronic files shall be submitted for review and acceptance. The Final Submission and As-Constructed submission shall also include a CAD file that meets the Township's format; if layering, line type & thickness or format is not adhered to the submission shall be deemed incomplete.

- The Final Submission and As-Constructed digital drawing file shall be georeferenced. The standard coordinate system for Oro-Medonte is Universal Transverse Mercator (UTM) Zone 17 with the North American Datum 1983 (NAD83). The drawing units for all features shall be in metric, set to metres and un-scaled (1:1).

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SUBDIVISION NAME

SUBDIVISION TYPE

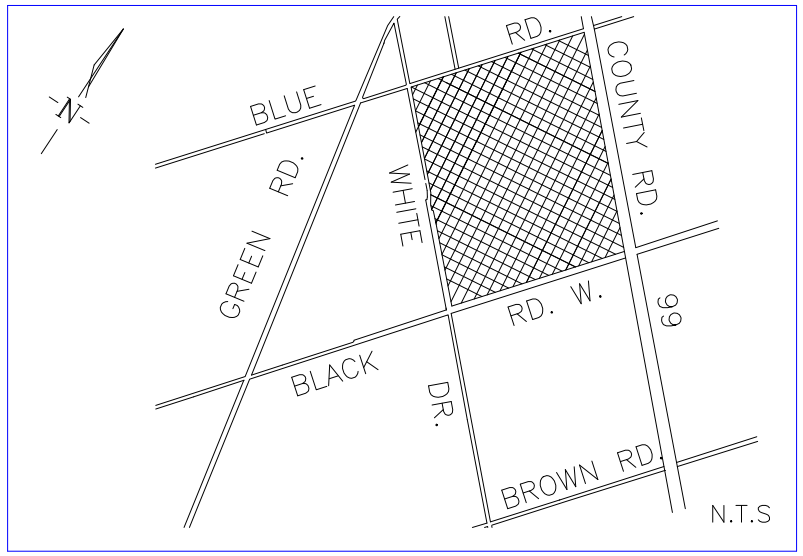
XXM–XXXXX

TOWNSHIP of ORO–MEDONTE

DEVELOPMENT SERVICES DEPARTMENT

148 LINE 7 South
ORO–MEDONTE, ON L0L 2E0

(705) 487–2171



KEY PLAN

DEVELOPER

NAME

ADDRESS

E–Mail ADDRESS

PHONE #

DEVELOPER'S CONSULTING ENGINEER

NAME

ADDRESS

E–Mail ADDRESS

PHONE #

STANDARD DRAWING NAMES

TITLE	–	TITLE, KEY PLAN, LIST OF DRAWINGS SHEET
LP	–	LEGAL PLAN
GSP1	–	GENERAL SERVICES PLAN
SAN1	–	SANITARY DRAINAGE PLAN
STM1	–	STORM DRAINAGE PLAN
SWMP	–	STORMWATER MANAGEMENT POND PLAN
GP1	–	GRADING PLAN(S)
ESCP	–	EROSION and SEDIMENT CONTROL PLAN
PP1	–	PLAN and PROFILE(S) STA. 000.00 to 111.11
SD1	–	STANDARD DETAILS
GN1	–	GENERAL NOTES
CUP1	–	COMPOSITE UTILITY PLAN
SLP1	–	STREET LIGHTING PLAN
LPP1	–	LANDSCAPE and PLANTING PLAN

NO.	REVISION	APR'D	DATE
1	Development Services Department		05/23

TOWNSHIP OF ORO–MEDONTE

STANDARD TITLE PAGE

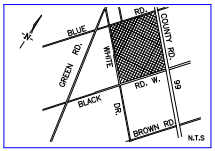
APR'D:

DRAWN:

DATE: 03 / 2016

SCALE: NTS

STD. No. 3.2–01



KEY PLAN

GENERAL NOTES

1. ALL DIMENSIONS, ELEVATIONS AND SIZES ARE IN METRIC UNITS UNLESS OTHERWISE INDICATED
   PIPE SIZES ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.
   ELEVATIONS ARE IN METRES UNLESS OTHERWISE INDICATED.

BENCH MARK DATA

NO.	REVISIONS	DATE	APPROVED

TOWNSHIP of ORO-MEDONTE APPROVED

DATE: .....

Manager of Development Engineering

TYPICAL TITLE BLOCK

Typical Design, Stationing or Specific Details

TOWNSHIP of ORO-MEDONTE DEVELOPMENT SERVICES DEPARTMENT

SCALE HOR.	VERT.	DRAWING NO.
DESIGN	DRAWN	SHEET NO.
REVISED	DATE	

NO.	REVISION	APR'D	DATE
1	Manager of Development Engineering		05/23
2	Development Services Department		05/23

APR'D:

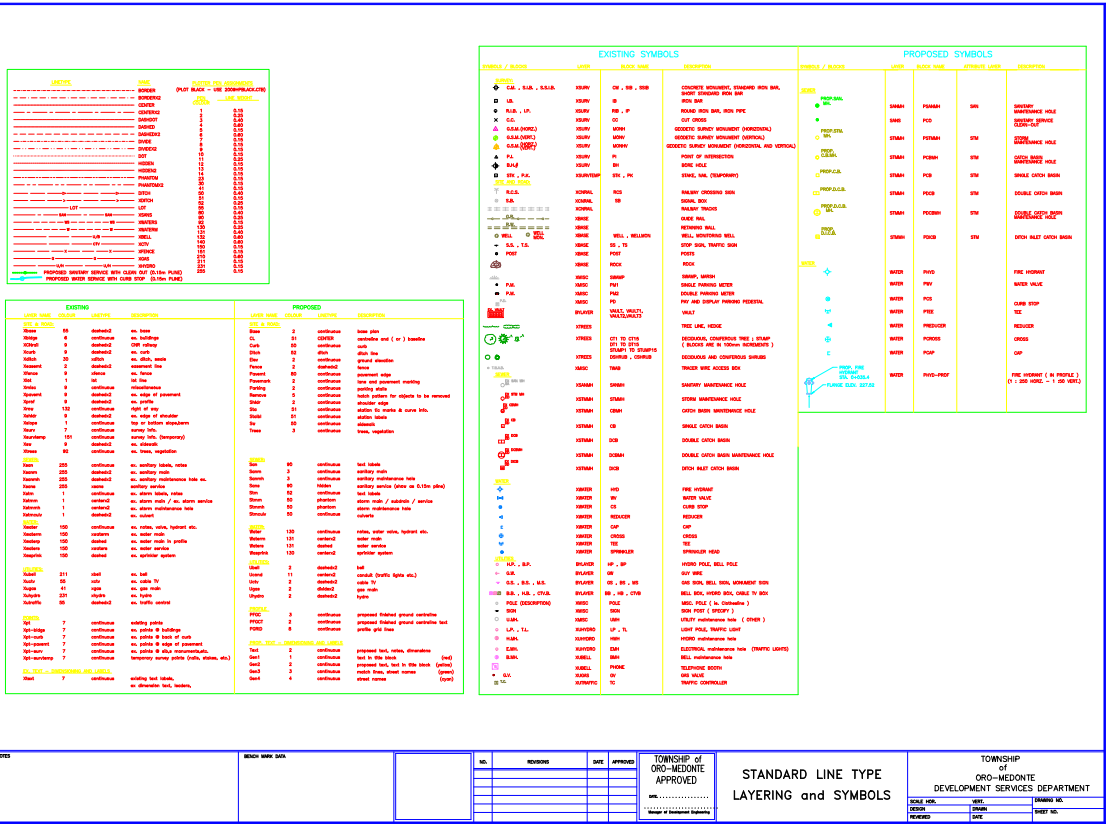
DRAWN:

DATE: 03 / 2016

SCALE: NTS

STANDARD PLAN SHEET

STD. No. 3.2-02



NO.	REVISION	APR'D	DATE
1	Manager of Development Engineering		05/23
2	Development Services Department		05/23

TOWNSHIP OF ORO-MEDONTE

STANDARD LINE TYPE LAYERING and SYMBOLS

APR'D:

DRAWN:

DATE: 03 / 2016

SCALE: NTS

STD. No. 3.2-03

3.3 General Servicing Plans

A General Servicing Plan drawing showing aboveground services and appurtenances shall be prepared for **all** developments at a maximum scale of 1:1,000.

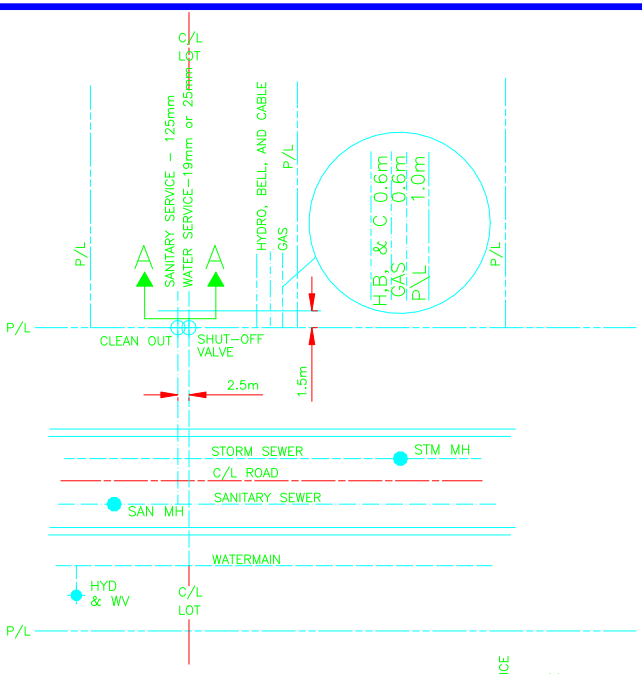
When more than one General Servicing Plan drawings are required, then the division of drawings shall reflect the limits of the Registered Plans as closely as possible. Where more than one plan is prepared, a supplementary General Servicing Plans at a smaller scale shall be prepared to show the entire plan of subdivision on one drawing.

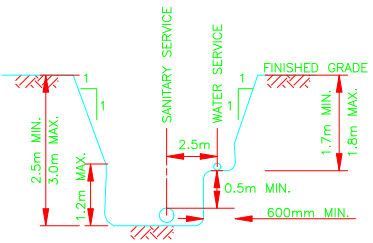
- The reference Geodetic Benchmark and the Site Benchmarks to be used for construction shall be identified on the General Plan of Services.
- A Key Plan at a scale of 1:10,000 shall be shown on **all** General Servicing Plans drawings and the area covered by the drawing shall be clearly identified.
- A drawing index shall be shown on **all** General Servicing Plans to identify the Plan and Profile Drawing number for each road or easement shown.
- **All** road allowances, lots, blocks, easements, and reserves are to be shown and are to be identified in the same manner as shown on the Registered Plan.
- **All** existing services, utilities and abutting properties are to be shown in light or background weight lines.
- **All** services to be constructed are to be shown on the General Servicing Plans in solid lines.
- Dimensioning of utilities and roadways is not required on the General Servicing Plans.
- **All** sites for parks, schools, churches, commercial and industrial development shall be shown.
- If a subdivision encroaches on an existing floodplain, the approved fill line restrictions shall be shown on **all** applicable drawings.

General Servicing Plans shall indicate (but not be limited to) the following:

- horizontal control data
- roadways with curb lines and road names
- typical residential building envelopes (complete with driveway locations)
- any required easements and blocks

- watermain with notes indicating material, diameter, and length;
- water valves, curb stop valves, hydrants, connections, and services
- maintenance access hole numbers
- both sanitary and storm sewers with direction of flow and notes indicating diameter, length, grade
- signage: - traffic control
  - road names
  - school zones
- traffic barricades
- fencing indicating height and type
- retaining walls
- community mailboxes with number of units serviced
- hydro vaults, Bell Telephone, and cable boxes
- streetlights
- boulevard trees
- sidewalks, walkways and trailways





SECTION A–A

SCALE: NTS

NOTES:

1. SERVICE TO EXTEND 1.5m INSIDE PROPERTY LINE.
2. UNDER NO CIRCUMSTANCE SHALL SERVICES CROSS ONE ANOTHER.
3. THE MINIMUM SIZE FOR STORM DRAIN CONNECTION SHALL BE 150mø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE STORM SEWER TO THE BUILDING ENVELOPE.
4. ALL UNDERGROUND SERVICE CABLES TO BE PLACED MINIMUM 1.0m BELOW FINISHED GRADE AT LOTS.
5. CLEANOUT AND SHUT–OFF VALVES TO BE PLACED ON PROPERTY LINE.
6. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS UNLESS OTHERWISE SPECIFIED.

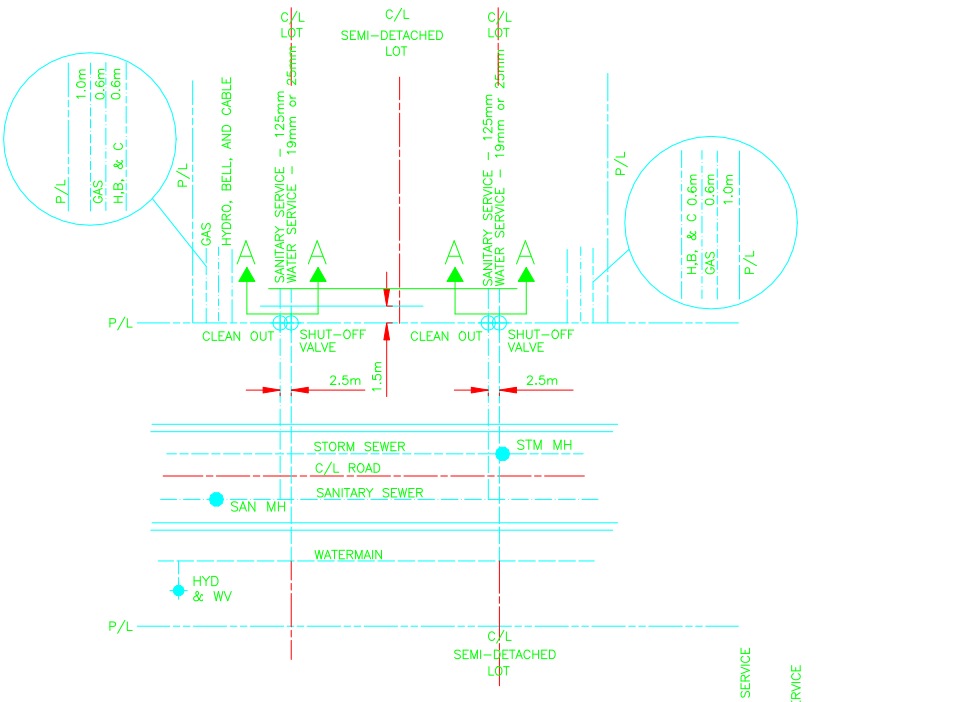
NO.	REVISION	APR'D	DATE
1	Water Service Size – 19mm or 25mm		05/23

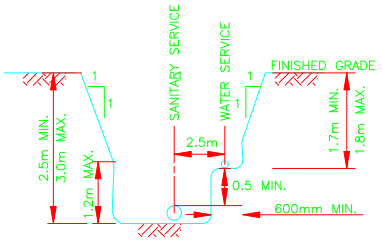
TOWNSHIP OF ORO–MEDONTE

SERVICE LOCATION
SINGLE FAMILY RESIDENTIAL

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.3–01





SECTION A–A
SCALE: NTS

NOTES:

1. SERVICE TO EXTEND 1.5m INSIDE PROPERTY LINE.
2. UNDER NO CIRCUMSTANCE SHALL SERVICES CROSS ONE ANOTHER.
3. THE MINIMUM SIZE FOR SANITARY LATERALS SHALL BE 125mm∅ INSTALLED AT A MINIMUM GRADE OF 2% FROM THE SANITARY SEWER TO THE BUILDING ENVELOPE. P.V.C. PIPE TO BE WHITE.
4. ALL UNDERGROUND SERVICE CABLES TO BE PLACED MINIMUM 1.0m BELOW FINISHED GRADE AT LOTS.
5. CLEANOUT AND SHUT-OFF VALVES TO BE PLACED ON PROPERTY LINE.
6. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS UNLESS OTHERWISE SPECIFIED.

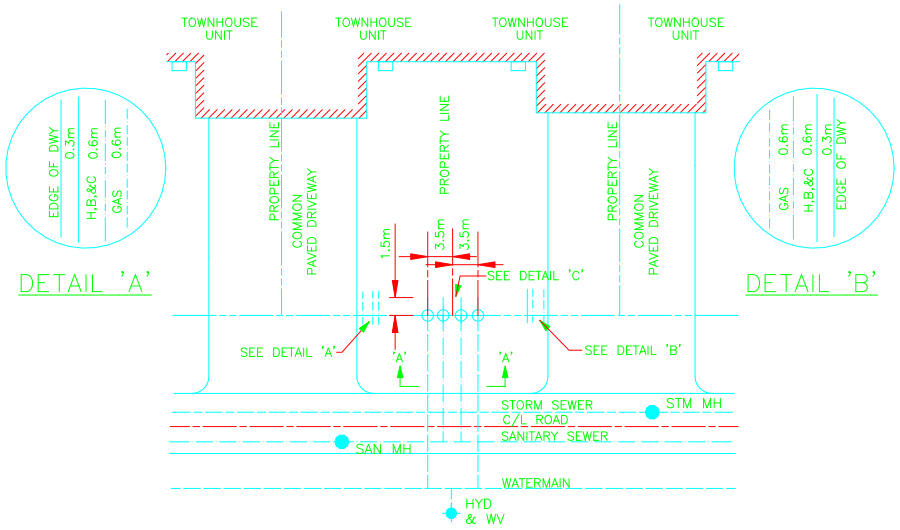
NO.	REVISION	APR'D	DATE
1	Water Service Size – 19mm or 25mm		05/23

TOWNSHIP OF ORO–MEDONTE

SERVICE LOCATION
SEMI DETACHED RESIDENTIAL

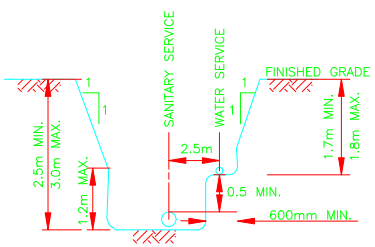
APR'D:
DRAWN:
DATE: 03 / 2016
SCALE: NTS

STD. No. 3.3–02



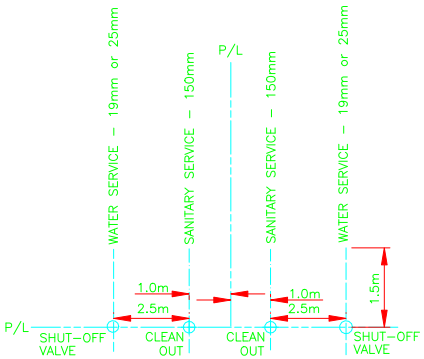
DETAIL 'A'

DETAIL 'B'



SECTION A–A

SCALE: NTS



DETAIL 'C'

SCALE: NTS

NOTES:

1. SERVICE TO EXTEND 1.5m INSIDE PROPERTY LINE.
2. UNDER NO CIRCUMSTANCE SHALL SERVICES CROSS ONE ANOTHER.
3. THE MINIMUM SIZE FOR SANITARY LATERALS SHALL BE 125mmø INSTALLED AT A MINIMUM GRADE OF 2% FROM THE SANITARY SEWER TO THE BUILDING ENVELOPE. P.V.C. PIPE TO BE WHITE.
4. ALL UNDERGROUND SERVICE CABLES TO BE PLACED MINIMUM 1.0m BELOW FINISHED GRADE AT LOTS.
5. CLEANOUT AND SHUT–OFF VALVES TO BE PLACED ON PROPERTY LINE.
6. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE
1	Water Service Size – 19mm or 25mm		05/23

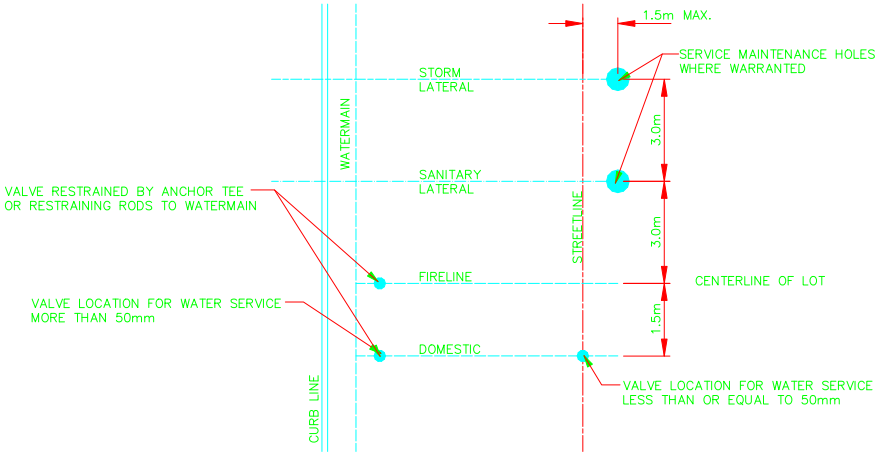
TOWNSHIP OF ORO–MEDONTE

SERVICE LOCATION
FREEHOLD TOWNHOUSE UNITS

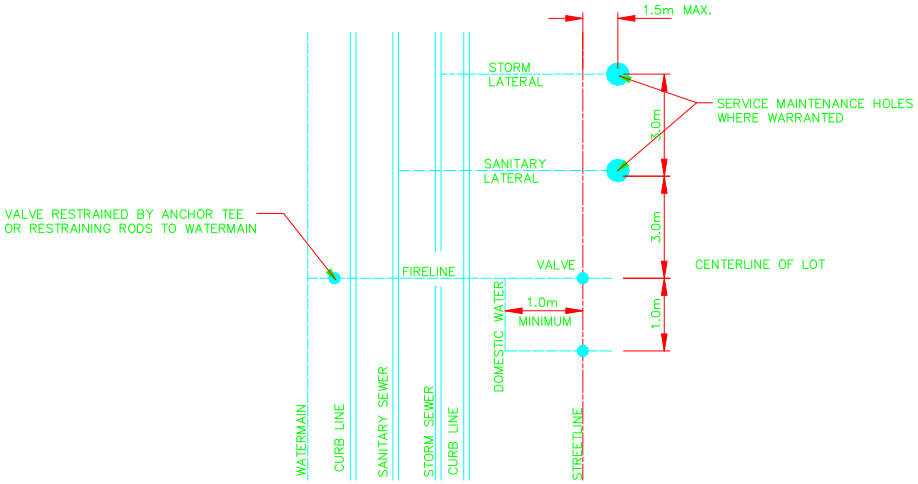
APR'D:
DRAWN:

DATE: 03 / 2016
SCALE: NTS

STD. No. 3.3–03



SHORT SIDE CONNECTION



LONG SIDE CONNECTION

NOTE:

1. SERVICE LOCATIONS TO BE CONFIRMED WITH THE TOWNSHIP OF ORO-MEDONTE.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
SERVICE LOCATION – COMMERCIAL, INDUSTRIAL AND MULTI-RESIDENTIAL	STD. No. 3.3-04	

GENERAL – CONSTRUCTION

A. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH TOWNSHIP OF ORO–MEDONTE STANDARDS, O.P.S.D. AND O.P.S.S. WHERE CONFLICT OCCURS, TOWNSHIP STANDARDS ARE TO GOVERN.

B. TRENCH BACKFILL (OPSD 802.XXX AS APPLICABLE) TO BE SELECT NATIVE MATERIAL OR IMPORTED SELECT SUBGRADE TO OPSS 1010.

C. BACKFILL TO BE PLACED IN MAXIMUM 200 mm THICK LIFTS AND COMPACTED TO 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).

D. PIPE BEDDING TO BE GRANULAR 'A' PIPE COVER TO BE GRANULAR 'B' MAX. AGGREGATE SIZE 25mm FOR RIGID PIPE AND GRANULAR 'A' FOR FLEXIBLE PIPE. (MINIMUM BEDDING DEPTH 150 mm, MINIMUM COVER 300mm, COMPACTED TO A MINIMUM 95% SPMDD).

E. CLEAR STONE WRAPPED IN FILTER FABRIC CAN BE SUBSTITUTED FOR BEDDING MATERIAL IF APPROVED BY THE TOWNSHIP OF ORO–MEDONTE.

F. ALL MAINTENANCE HOLES ARE 1500 mm DIAMETER FOR A MINIMUM OF 1.8M FROM THE BOTTOM OF THE CHAMBER UNLESS OTHERWISE SPECIFIED.

G. ALL TOPSOIL AND EARTH EXCAVATION TO BE STOCK PILED OR REMOVED TO A SITE APPROVED BY THE TOWNSHIP OF ORO–MEDONTE OR THE TOWNSHIP'S ENGINEERING CONSULTANT.

H. THE OWNER'S ENGINEER SHALL PROVIDE BENCH MARK ELEVATIONS AND HORIZONTAL ALIGNMENT REFERENCE FOR THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED LAYOUT OF THE WORK.

I. ALL PROPERTY BARS TO BE PRESERVED AND REPLACED BY O.L.S. AT CONTRACTOR'S EXPENSE IF REMOVED DURING CONSTRUCTION.

J. ALL MAINTENANCE HOLE AND CATCHBASIN FRAMES AND COVERS TO BE SET TO BASE COURSE HL4 ASPHALT ELEVATION AND RAISED PRIOR TO PLACEMENT OF FINAL COURSE HL3 ASPHALT TO THE SATISFACTION OF THE TOWNSHIP.

K. THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR THE SUPPLY OF TEMPORARY WATER AND POWER.

L. DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS–517 AND 518 TO MAINTAIN ALL TRENCHES IN A DRY CONDITION. CONTRACTOR RESPONSIBLE FOR OBTAINING AN M.E.C.P. PERMIT AS REQUIRED.

M. ALL ENGINE DRIVEN PUMPS TO BE ADEQUATELY SILENCED, SUITABLE FOR OPERATION IN A RESIDENTIAL AREA.

N. DISTURBED AREAS TO BE REINSTATED TO PREVIOUS CONDITION OR BETTER.

O. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVATION OF ALL EXISTING FACILITIES AS WELL AS ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK AND CO–ORDINATE CONSTRUCTION ACCORDINGLY.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

NOTES – CONSTRUCTION

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.3–05

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3.4 Overall Grading Plan Design and Construction

3.4.1 General Requirements

- **All** elevations to be referenced to geodetic datum.
- The grading of **all** lands within the site are to be compatible with the elevation of the surrounding lands.
- A 0.6 m strip shall be left undisturbed along the boundary of the subdivision unless grading is required to eliminate drainage issues on adjacent properties
- **All** lots and blocks within the subdivision are to be shown and are to be numbered in accordance with the plan proposed for registration.
- Existing contours are to be shown at maximum 0.5 m intervals.
- The Overall Grading Plan shall identify **all** locations where the depth of fill sections and cut sections are in excess of 450 mm.
- **All** grassed embankments shall have a maximum slope of 3:1.
- The grade of grassed or other landscaped areas shall have a maximum slope of 7% and a minimum slope of 2%.
- Swale grades on grassed areas shall have a min. slope of 2% and a max. slope such that contained flow velocity does not exceed 1.25 m per second.
- The maximum suggested length for any drainage swale is 75 m.
- The minimum depth for any drainage swale shall be 150 mm.
- The maximum depth for any drainage swale shall be 750 mm.
- The maximum side slope on any drainage swale shall be 3:1.
- **All** driveways shall have positive drainage from the property line to the edge of pavement.

3.4.2 Overall Grading Plan Drawings

The Overall Grading Plans shall indicate, but not be limited to the following:

- A legend indicating existing elevations and proposed elevations.
- Cross sections as required to clarify the proposed grading, particularly in relation to adjacent lands.

- Silt Control fencing shall be shown within the 0.6 metre undisturbed strip along the boundary of the subdivision.
- Existing contours at maximum 0.5 m intervals within the subdivision and extended outside the subject lands far enough to determine the existing drainage pattern.
- Existing elevations at existing road sections, parking areas, structures, trees, watercourses, or other elevations necessary to establish the grading and drainage patterns.
- Arrows are to be used to indicate direction of the surface drainage.
- Roadway dimensions and curb radii.
- Centreline elevations of proposed and existing roads at 20 m intervals.
- Curbs and curb depressions with dimensions.
- Sidewalks, walkways and trailways.
- **All** lots, blocks, and easements within the subdivision, numbered in accordance with the plan proposed for registration.
- Physical structures such as embankments, stairs, play areas, splash pads, etc.
- **All** terracing required with the intermediate grades specified.
- **All** swales, other than the normal side yard swales, along with percent grade and the invert elevation of the swale at regular intervals.
- Lot fabric of subject lands.
- Arrows indicating the direction of the surface water run-off from **all** lots.
- Driveway locations, water service curb stop locations and building envelopes.
- Proposed elevations at front and rear building envelope.
- Proposed retaining wall(s) location, material, and height.
- Proposed fencing type, material, and height.
- Proposed and existing culverts;
- Proposed grades for major and minor overland flow routes;
- Proposed elevations at the corners of each lot, block and point of grade change.
- Proposed elevations at side yard highpoints (as applicable).
- Proposed 0.5 m contours for grading within large blocks and parks.

- Proposed locations for building envelopes and envelopes for private sewage disposal where required.
- Proposed elevations on paved surfaces, around proposed buildings, along swales, along roadways, parking areas, driveways, catch basin rim elevations, and other elevations necessary to establish the grading and drainage patterns.
- Proposed and existing storm sewer / drainage structures, including rim elevations.
- Rear lot catch basins shall also include the invert elevation of the outlet pipe.

3.4.3 Construction Requirements

Prior to the commencement of construction, the Developer shall construct a Construction Access (and as necessary an Emergency Access) in accordance with these Standards and such that vehicles, equipment, and materials delivery do not route through existing residential developments (wherever possible). The routing shall be Approved in Advance by the Township.

Prior to commencing rough grading, the Developer shall implement the approved erosion and sediment control plans as outlined in the Township Standards.

Where the proposed grading plan identifies fill over registered lots - Engineered Fill shall be placed and supervised by the Developer's Geotechnical Consultant.

- **All** block grading shall conform to the stormwater management report. The Developer shall be responsible for the grading and maintenance of all blocks until assumption of the subdivision.
- Blocks intended for future development shall be graded to preliminary grade and drain appropriately, compatible with adjacent roadways and abutting properties; complete with appropriate erosion stabilization and sediment control measures.
- Where earth cuts and fills in excess of 450 mm are required within the lots and blocks of the new development, area rough grading shall be performed prior to road construction.
- **All** swales shall be topsoiled (minimum 100 mm) and sodded.
- **All** retaining walls in excess of 1.0 m to be certified by a Professional Engineer.
- Lot drainage is to be self-contained within the subdivision limits, where possible.

The Developer's Consulting Engineer in conjunction with their Geotechnical Engineering Consultant shall be responsible for approval and certification of the following:

- certification that **all** silt and sediment protection measures have been put in place and are being monitored regularly and repaired as necessary, in accordance with the Township Standards.
- certification that the areas of engineered fill have been filled and compacted in accordance with the Township Standards.
- certification that the overall site grading plan conforms to the storm drainage plan and that **all** earthen and granular material conforms to the requirements set out in the geotechnical report.
- certification that the final block grading plan conforms to the storm drainage plan. The block grading plan and certification shall be submitted with the building permit application.

3.5 Road Classification and Design

3.5.1 Road Patterns

All new roads shall have regard for the following:

- **All** new Township roads shall provide access, where possible, from two connecting directions to every private property, with qualified exception. Connecting pedestrian ways may be required by Official Plan policy, despite exceptions for roads.
- Existing non-conforming roads are permitted to continue as an exception unless indicated otherwise by planning process, or where infrastructure has been configured for continuity, or the access is required to bring adjacent development into conformity.
- An exception to may be considered where: the second access is only available in future development – in which case such access shall be planned for and pre-serviced with a temporary cul-de-sac, or extenuating natural topographic features prevent the reasonable design of road and related services in connecting patterns, or Environmental Policy Areas or other environmentally regulated areas prevent second access, or the necessary lands cannot be acquired.

3.5.2 Road Classifications

All roads in new developments shall be classified according to the traffic volume expected and to the intended use of the roadway. For predominantly residential areas 2 classifications shall be noted as follows: Urban and Local Residential.

For industrial areas the roads shall be classified Local Collector and Industrial and Major Collector and Industrial dependent upon length of road, traffic volume expected and expected amount of truck traffic. The proposed classification of **all** roads in the development shall be confirmed with the Township prior to the commencement of the design.

Road Allowances shall be a minimum of 20 m wide. Where the subdivision adjoins or incorporates an existing County Road or Township arterial road as shown on the Township's Official Plan, the Developer shall deed to the County or Township sufficient

widening to make these Road Allowances a minimum of 30.5 m, or additional widening if deemed necessary by the Township or County.

The following table is presented as a guide to the determination of the road classifications:

CRITERIA	**RESIDENTIAL Urban / Local**	**MINOR COLLECTOR and INDUSTRIAL**	**MAJOR COLLECTOR and INDUSTRIAL**
Source Provided	Land Access	Land Access	Traffic
Movement	Traffic Movement	Traffic / Trucking	Traffic / Trucking
Length of Trip	Short	Medium	Long
Flow	Interrupted	Interrupted	Through
Interconnections	Local	Local and Collector	Collector
Estimated A.A.D.T.	0—1,000	1,000—3,000	over 3,000

3.5.3 Roadway Design

All roadways shall be required to satisfy Fire Access Route Design as per OBC Div. B 3.2.5.6 and designed in accordance with the most recent Township Standards.
The minimum pavement design for **all** roadways shall be:

- subgrade compacted to 95% Standard Proctor Density
- 300 mm. compacted depth of Granular “B”
- 150 mm. compacted depth of Granular “A”
- 50 mm. compacted depth of HL4 Asphalt base course
- 40 mm. compacted depth of HL3 Asphalt surface course

All driveways shall be paved with asphalt or an approved alternate from the edge of the roadway to the garage. The minimum asphalt pavement design for **all** driveways shall be:
- subgrade compacted to 95% Standard Proctor Density
- 150 mm compacted depth of Granular “A”
- 50 mm compacted depth of HL3 asphalt

- The minimum width of a roadway for two-way traffic with **no** on-street parking shall be 7.0 m from E/P to E/P.

- **All** roads serving multiple-family projects shall be designed to facilitate passage of emergency and service vehicles. Curb returns having an 8.0 m. radius and inside bends having at least a 12.0 m radius are required. On dead end roads provision shall be provided for vehicle turning.
- Minimum road grade shall be 0.5% and Maximum road grade shall be 6.0%.
- Minimum driveway grade shall be 2% within the right-of-way and 2% on private property. Maximum driveway grade shall be 7%. This maximum grade shall only be used when necessary due to site conditions.
- The location of driveway entrances on Township roads in new **Subdivisions Developments** shall be such that the minimum sight distance is maintained in both directions.

The following criteria shall apply to new driveway entrances in new residential development:

Posted Speed Limit	**Minimum Sight Distance**
km/h	metres
40	45
50	65

3.5.4 Geometric Design Requirements

All roads designed and constructed shall conform to the Transportation Association of Canada (TAC) Geometric Design Standards, unless expressly approved otherwise.

Super-elevation of a road shall **not** be permitted without approval. Edge of pavement radius at intersections shall be at least 10m (15m on industrial roads). Ninety (90) degree curves or corners, where alignment permits them, shall **not** be less than 15m radius to the inside edge of pavement.

Where lesser roads enter into collector, arterial or through roads, special consideration shall be given to: Improved Visibility, Wider Turning Radius, Acceleration Lane and Ramps, and Deceleration Ramps. Each case is to be considered on its traffic, flow pattern, type, and quantity.

3.5.5 Horizontal Curves

Horizontal alignment is to conform to the requirements as outlined in Table 1. In general, “right angle bends” shall not be permitted on local roads except in the case of “Courts” or “Crescents” serving no more than 50 residential lots. Where permitted, these bends shall not have a deflection angle greater than 110 degrees.

3.5.6 Vertical Curves

All points of grade change in excess of 1% shall be designed with vertical curves as outlined in current MTO publications.

- The minimum visibility curves to be used are outlined in the geometric details for each roadway classification in Table 1.
- The minimum tangent length of any road grade shall be 9 metres.

3.5.7 Backfall at Intersecting Roads

At **all** road intersections the normal crossfall of the major road shall not be interrupted by the crown line of the minor road. A 1 to 2 per cent backfall shall be provided on the minor road at **all** road intersections. This backfall shall continue to the end of the curb return radii to facilitate proper drainage of the intersection. Overland flow routing of storm drainage through the intersection shall be maintained.

3.5.8 Curb Return Radii at Intersections

Curb Return Radii at Intersections shall conform to dimensions presented in Table 1.

Geometric Design Requirements

Table 1

Road Classification	**Residential**		**Collector / Industrial**			
Design Element	**Urban / Local**		**Local / Major**		**2 Lane**	**4 Lane**
ROW Width (m)	20.0		20.0 / 26.0		20.0	26.0
Road Width (m) (face of curb)	8.5 / 7.0		9.0 / 15.0		9.0	15.0
Design Speed (km/h)	50		60		60	60
Posted Speed (km/h)	40 or 50		50 / 60		50	60
Stopping Sight Distance (m)	45 (40kph) 65 (50kph)		135 (50kph) 170 (60kph)			
Horizontal Curve Radius (m)	90		90 / 130		90	130
Maximum Grade (%)	6		6		6	6
Minimum Grade (%)	0.5		0.5		0.5	0.5
Crest Curve	6		6		6	6
Sag Curve - unlit	12		12 / 18		12	18
Sag Curve - illuminated	5		12		12	12
Crossfall from Centerline	2 %		2 %			
Standards at Intersections	**Intersecting Roads**					
Design Element	Urban Res. - Urban Res.	Local Res.- Local Res.	Local collector - Local collector	Local collector - Major collector	Major collector - Major collector	
Intersection angle (degrees)	70-110	70-110	80-100	80-100	80-100	
Curb Radius - minimum (m)	12.5	12.5	12.5	15	18	
Daylight Triangle - minimum (m)	5	5	15	15	18	
Max grade for through road (%)	3	3	3	2	2	
Tangent on approach (from limit of daylighting) - min (m)	30	50	60	75	75	
NOTES:						
1. Additional daylighting requirements shall be designed by the Developer's Consulting Engineer according to the particular situation, but shall not be less than those detailed above						
2. All designs shall consider requirements of other Road Authorities (MTO, County, other Municipality) where applicable						

3.5.9 Daylighting Requirements at Intersections

Daylighting at **all** intersection quadrants shall be included in the road allowances to provide for uniform boulevard widths. Such daylighting shall be included on the proposed plan for Registration (M-Plan) and on **all** engineering drawings.

Township Residential Roads (Urban and Local) - being Subdivision Roads of > 50 kph intersecting Township Residential Roads (Urban and Local) - being Subdivision Roads of > 50 kph, the minimum daylighting requirement shall be a 5.0 m x 5.0 m triangle.

In the event a Township Residential Roads (Urban and Local) should intersect a road of another Municipality, consultation with the adjacent Municipality shall take place and be documented as to the agreed to provision for the minimum daylighting requirement included in the design.

For intersecting Township Urban Collector and Arterial Roads and Township Roads intersecting County roads, the minimum daylighting requirements shall be a 15.0 m x 15.0 m Daylighting Triangle. For **all** other intersections, the size of the daylighting or visibility triangle is a function of the number and width of lanes, the various design speeds on the intersecting roads and the R.O.W. widths on both roads.

Except where provision is made otherwise, clearing and grubbing (including stumps) within the full width of the R.O.W. is required

On some low volume, rural roads, permission may be granted to clear a minimum width, sufficient to accommodate the construction of the road and ditches.

Where a physical obstruction interferes with the day lighting, visibility, safety, aesthetic view or drainage of the road, the developer or Developer may be requested to remove it from the R.O.W. Where the road is being constructed under agreement with the Township, such removal is the responsibility of the Developer and is to be considered as a condition of the agreement.

If such an obstruction is located off the R.O.W., it is the responsibility of the developer to gain proper permission prior to removal. Where brushing of the R.O.W. is required to meet the Township Standard, the Township may request an easement on the affected land to maintain visibility.

In **all** cases, the alignment, vertical and horizontal curves, stopping sight distances, etc., the Developer's Consulting Engineer shall submit detailed calculations for sizing of daylighting triangles at these intersections in accordance with the design criteria prepared by the Ministry of Transportation Ontario, Chapter E (at Grade Intersections) and / or the current Transportation Association of Canada (TAC) Design Manual.

3.5.10 Cul-de-sacs

Cul-de-sacs are **discouraged** by the Township because of the life safety risks encountered and **shall be avoided whenever possible.**

If a cul-de-sac is planned, then consideration shall be given to reserve an easement that may be used at a future date to link the end of the road to another road.

Permanent cul-de-sacs shall be constructed in accordance with the details provided in the standard drawings and shall be designed with a minimum grade of 1% from the centre of the bulb to the curb.

Minimum gutter grades of 1% shall be maintained along the flow line of **all** gutters around the cul-de-sac. The design road grade on the cul-de-sac shall be such that the drainage is directed away from the end of the cul-de-sac and towards the beginning of the bulb area where catch basins are to be located.

All cul-de-sacs, bulbs and intersections shall be detailed at a scale larger than the road plan. The details shall show gutter, crown, and other grades sufficient to determine that the road shall properly drain and shall be used as a basis for layout.

The radius from the edge of the driving surface to the centre of the cul-de-sac shall not be less than 13.0m for Local Residential roads and 15.0m for Urban Residential roads.

Fire hydrants shall be located at every intersection of a cul-de-sac and through road and uniformly filled in along the road with no distance greater than 150m between fire hydrants. The **maximum length** of a cul-de-sac without emergency access shall be 150 m. and any length greater than 150 m. shall have maintainable emergency access (as a dedicated block) of not less than 6.0m min. in width - hard surfaced and fenced.

3.5.11 Temporary Turning Circles

Temporary turning circles **may** be considered whenever a road is to be continued in the future in a phased Plan of Subdivision. Details for the requirements of temporary turning areas are provided in the Standard Drawings. Temporary turning circles shall conform to the Local Residential Cul-De-Sac Std. Dwg. – 3.5-04

3.5.12 Driveway Entrances

For residential properties only one (1) entrance per lot shall be permitted.

Driveway Entrance Widths shall be:

- Single Family Residential:
    - Single Driveways – 3.0m in width minimum
    - Double Driveways – 6.0 m in width maximum
      Driveway **within the Lot** of greater than 6.0 m width **may** be considered provided Zoning provisions and drainage design allow.
    - **Maximum Residential Driveway widths at the property line and contained within the Road Allowance shall be 6.0 m.**

The Developer is responsible for the grading, gravelling and the paving of **all** driveways from the curb or edge of pavement to the property line or to the sidewalk (where sidewalks are proposed within the development).

Driveway entrances shall be offset from the property line: a.) in accordance with the zoning provisions **or** b.) a minimum of 1.5 m.

Driveway entrances shall be offset a minimum of 1.5 m. from all utility boxes, utility poles, fire hydrants and other 'street furniture' as may be required to be installed within the Township Road allowance.

The minimum consolidated depth requirements for the granular base and asphalt in driveways shall be as follows:

- Single-Family Residential - asphalt 50 mm of HL3 asphalt
  - 150 mm of Granular "A"

Alternate driveway surface types (i.e. paving stones, patterned concrete pads, etc.) shall be subject to approval by the Township **prior** to construction.

Where driveway entrances are accessed by roads with open ditches:

- Driveway Entrance Culverts shall be Ultra Rib - Smooth Wall plastic pipe.
- The **minimum length** of each driveway culvert shall be 7.0 m and the minimum diameter shall be a **minimum of 450 mm in diameter** or larger according to the Stormwater Management requirements.

- The maintenance and repair of such culverts shall remain the responsibility of the Developer until such time as the Services have been Assumed by the Township at which time the Homeowner shall assume responsibility for their repair and replacement.
- The construction of driveway headwalls at each (either) end of the driveway culvert shall **not be permitted**, unless otherwise approved by the Township.

3.5.13 Driveway Grades

Driveway grading shall be in accordance with OPSD 350.010 for industrial, commercial and apartment entrances and OPSD 351.010 for residential entrances. The maximum permissible design grade for driveways on private lands shall be 7%. These maximum grades are not recommended and shall be employed only in exceptional cases where physical conditions prohibit the use of lesser grades. The minimum driveway grade shall be 2% within the right-of-way and 2% on private property.

The use of reverse grade (negative sloping) driveways shall **only** be considered in estate residential developments or under special circumstances.

Where reverse grade (negative sloping) driveways are permitted, a positive slope of at least 2% shall be maintained from the garage over a minimum distance of 7.0 metres and / or driveway catchbasins and drains shall be required.

Driveway catchbasins and drains shall be designed and sized such that **no** driveway ponding exists and **no** drainage or ponding occurs in proximity to the structure.

3.5.14 Driveway Depressions

The width and location of the depressions in the curb and gutter for single-family residential driveways shall be as detailed on OPSD 351.010 with particular attention being placed on the location of the garage and the direction of traffic flow.

Driveway depressions are to be placed when concrete Barrier Curb and Gutter (OPSD 600.010) is initially poured. Double driveway depressions (6.0 metres minimum width) are to be placed for **all** single-family residential lots.

Driveway depressions shall be located at a minimum distance that required as per zoning conditions or a minimum of 1.5 m from a side lot line. The minimum clear distance between the edge of driveway and a utility structure or hydrant shall be 1.5 m.

3.5.15 Special Road Works

Whenever it is necessary to cut through an existing Township Road, the Developer shall be responsible for properly compacting the backfill material and restoring the surface pavement to its original conditions immediately upon completion of backfilling operations. Joints between existing and new asphalt to be sealed with Denso Re-instatement Tape or equivalent.

Work shall not commence until the Township has been notified.

Before making detours, permission is required from the Manager of Development Engineering. Where the road is not part of the Township road system, approval from the appropriate road authority shall also be necessary.

In **all** cases the Fire, Police Departments, School Bus Companies and Ambulance Service shall be notified by the Developer or their Contractor.

NOTE: All works shall be undertaken in accordance with Township By-laws.

3.5.16 Sub-grade

All organic material within 1.2m of the final road-grade shall be stripped and removed prior to placing granular backfill. **All** material used as backfill shall be clean fill subject to borrow material specifications and shall not include organic material or building rubble.

Frost tapers, transition zones, culvert installations shall be constructed with an assumed frost depth of 1.5m and shall be built in accordance with O.P.S.S.

All rock shatter shall be to a minimum of 0.3m. Where small knobs of rock are in the sub-grade, they shall be excavated to the prevailing sub-grade depth.

The Township reserves the right to ask for pre-engineering in the form of bore holes, test pits, profiles, and drainage studies, etc. prior to final Township approval to proceed with engineering design.

3.5.17 Pavement Design

In general, pavement design shall be completed by the Developer's Geotechnical Consultant in accordance with the most recent Township of Oro-Medonte Development Engineering Policies, Process and Design Standards, OPSS and OPSD.

The minimum pavement design for **all** roads in new subdivisions shall be as detailed on the Standard Drawings. In **all** cases, the Developer's Geotechnical Consultant shall design, sample, and test a suitable pavement section for each particular site.

Soil sampling shall be carried out in the presence of the Developer's Geotechnical Consultant or their Inspector at intervals not exceeding forty (40) metres along the centreline of the subdivision road. The composition and design thickness of the pavement section shall be determined from:

- Mechanical sieve analysis of the subgrade soil
- Frost susceptibility
- Drainage
- Traffic volumes

Copies of **all** test results and proposed road designs shall be submitted with the Engineering Drawings. In no case shall a pavement design be less than the minimum Township of Oro-Medonte standard as shown on the standard drawing for the particular road classification be considered acceptable.

Prior to the placement of asphalt pavement, the Developer's Consulting Engineer shall submit to the Township for approval, the asphalt pavement mix designs. The pavement design shall be sufficient to provide for ultimate wheel loads over the road, prior to placement of surface course asphalt. In **all** cases base course asphalt shall be OPSS HL4 with a min. A.C. content of 5%.

3.5.18 Top Course Asphalt Placement

Prior to placement of top course asphalt, the following works shall be completed:

- **all** sidewalk, curb, and boulevard work
- raise maintenance hole and catch basin frames
- install delineation for raised frames 40 mm above asphalt lift
- flush and sweep surface and evenly apply tack coat;
- base course asphalt pad as required in accordance with OPSS
- final sewer video inspection
- place top course asphalt in accordance with OPSS

The following conditions shall also be met:

- a minimum period of one year has expired from the completion date for the placement of the base course asphalt
- 70% of the dwellings have received provisional Occupancy Certificates
- **all** undeveloped lots shall be rough graded in accordance with the overall grading plan
- **all** service connections for multiple-family, commercial, institutional blocks **shall not be installed** without the approval of the Township (obtained in writing)

In **all** cases top (final) course asphalt shall be OPSS HL3 with a min. A.C. content of 5%

3.5.19 Curbs and Gutters

In general, **all** new Township roads shall be constructed to an urban cross-section, with mountable curb and gutter to OPSD 600.030 on local roadways and barrier curb and gutter to OPSD 600.010 on collector or higher order roadways.

Prior to final acceptance **all** curb breakage shall be rectified by removing a minimum 1.0 m section of curb and replacing.

A driveway entrance is required for each lot. Curb depressions are required at each intersection as per OPSD 310.030.

A minimum of 300 mm of Granular ‘B’ material compacted to 95% Standard Proctor Density shall be required as a base for **all** curb installations.
Minimum Grade on Curb: 0.75% is desirable with 0.5% the minimum.

3.5.20 Guiderail – as per OPSD designs

Guiderail is required on **all** embankments in excess of three (3) metres in height. The roadway shoulders shall be widened an additional 0.5m to accommodate the guiderail. The type of structure shall be as follows:

- In Rural Settings: Three-cable Guide Rail or Box Beam Guardrail
- Adjacent to Water: Steel Beam Guiderail or Box Beam Guiderail

Guiderail shall be installed at **all** four (4) corners of bridge structures and Hazard Markers shall be erected on bridge structures.

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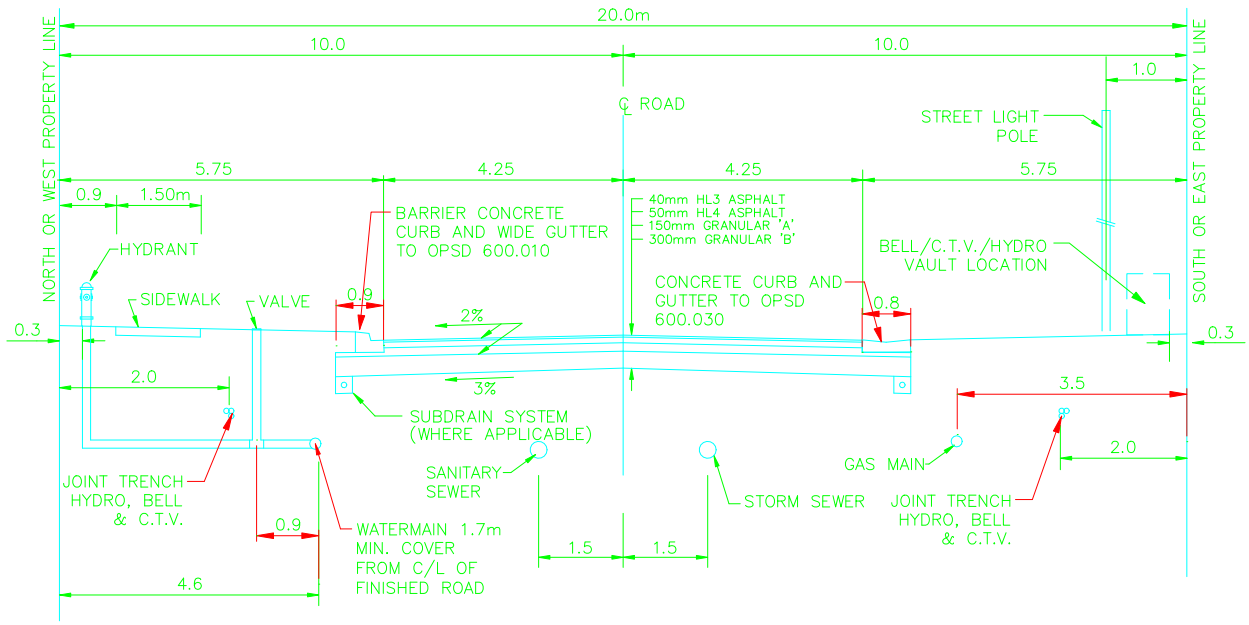


NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. MINIMUM PAVEMENT AND ROAD STRUCTURE DESIGN AS PER TOWNSHIP OF ORO-MEDONTE DESIGN CRITERIA OR AS PER GEOTECHNICAL INVESTIGATION RECOMMENDATION.
3. ALL SERVICE LOCATIONS SHOWN ARE FOR GUIDELINE PURPOSES ONLY AND MAY DEVIATE AS PER THE DIRECTION OF THE TOWNSHIP WHEN STANDARD LOCATION CANNOT BE ACHIEVED.
4. BOTH CURB TYPE OPSD 600.010 & OPSD 600.030 ARE PRESENTED. ONLY 1 TYPE SHALL BE USED.
5. WHERE ONE SIDEWALK IS CONSTRUCTED IT SHALL BE ON THE NORTH AND WEST SIDE OF THE ROAD.
6. TREES TO BE PLACED IN LOCATIONS AS PER APPROVED LANDSCAPE PLAN.
7. BOULEVARD – 100mm TOPSOIL & NURSERY SOD (OR SEED AND MULCH IF APPROVED)
8. HYDRO, BELL AND C.T.V. MAY RUN JOINT TRENCH AT STANDARD 2.0-2.6m OFFSET LOCATION. HYDRO, BELL, C.T.V. AND GAS TO HAVE 0.9m COVER.

NO.	REVISION	APR'D	DATE
1	1.50m Concrete Sidewalk		05/23
2	100mm Topsoil		05/23

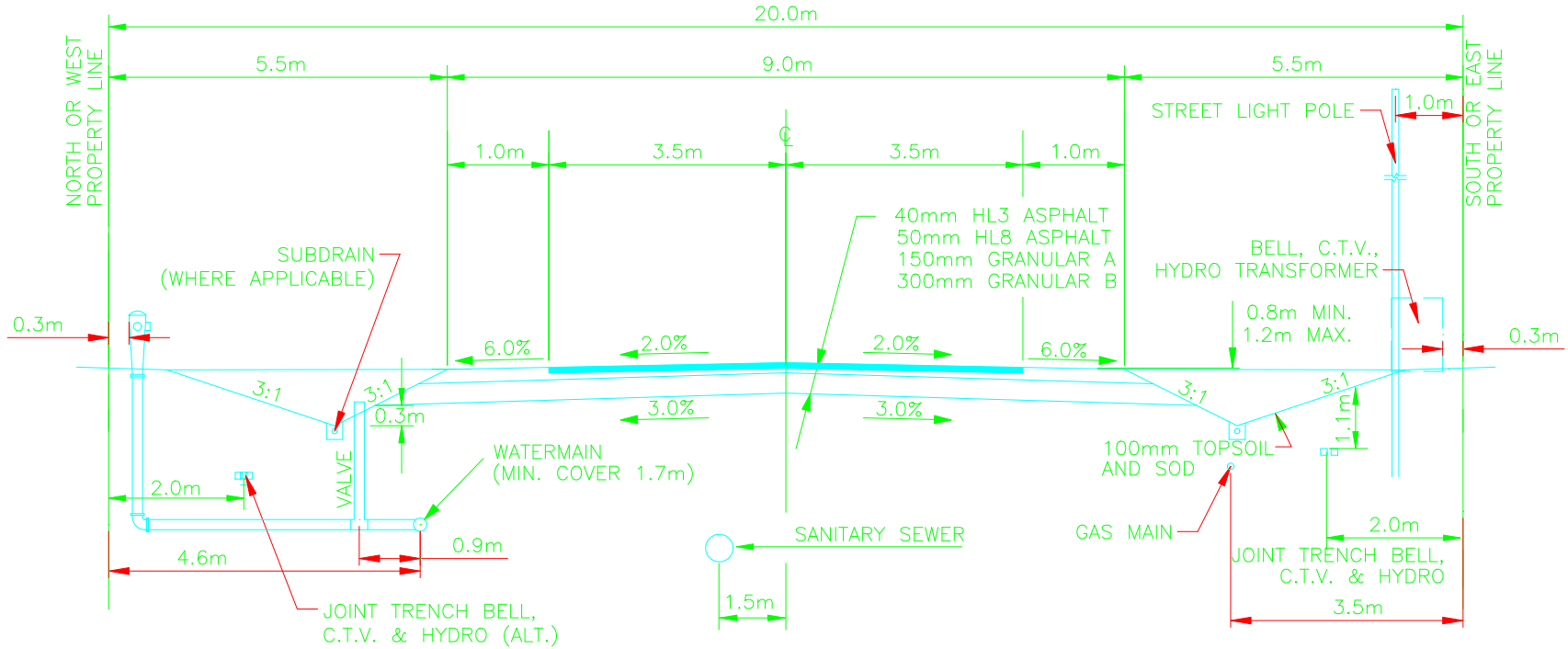
TOWNSHIP OF ORO-MEDONTE

URBAN RESIDENTIAL

20.0m ROAD ALLOWANCE
8.5m ASPHALT SURFACE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-01



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. MINIMUM PAVEMENT AND ROAD STRUCTURE DESIGN AS PER THE TOWNSHIP OF ORO–MEDONTE DESIGN CRITERIA OR AS PER GEOTECHNICAL INVESTIGATION RECOMMENDATION.
3. SERVICES * ARE LOCATED AS PER STANDARD – SHOULD SERVICES BE AVAILABLE (* Water, Sewer, Gas, Buried Hydro / Bell and C.T.V.).
4. ALL SERVICE LOCATIONS SHOWN ARE FOR GUIDELINE PURPOSES ONLY AND MAY DEVIATE AS PER THE DIRECTION OF THE TOWNSHIP WHEN STANDARD LOCATION CANNOT BE ACHIEVED.
5. ALL WATER CURB STOPS TO BE PLACED ON STREETLINE.
6. A 3.0m WIDE PLATFORM AREA SHALL BE CONSTRUCTED FOR EACH FIRE HYDRANT.
7. TREES TO BE PLACED IN LOCATIONS AS PER APPROVED LANDSCAPE PLAN.
8. HYDRO, BELL AND C.T.V MAY RUN JOINT TRENCH AT STANDARD 2.0–2.6m OFFSET LOCATION. HYDRO, BELL C.T.V. AND GAS HAVE 0.9m COVER.

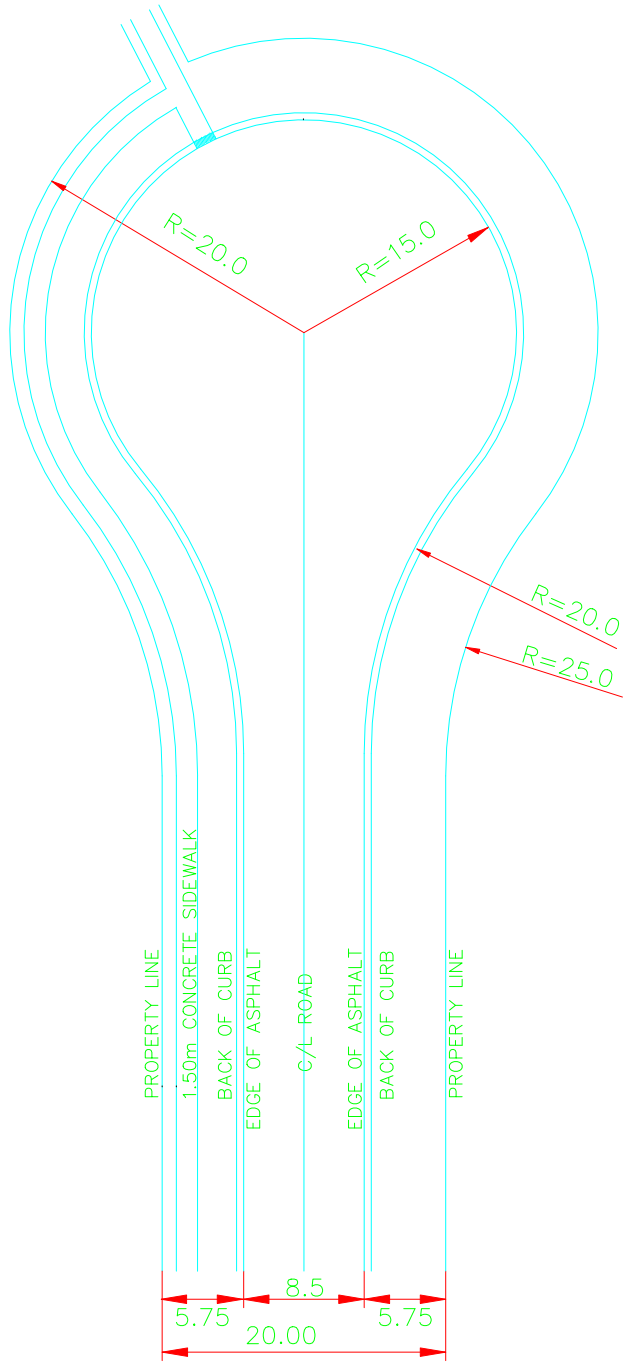
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

LOCAL RESIDENTIAL
20.0m ROAD ALLOWANCE
9.0m ASPHALT SURFACE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5–02



NOTES:

1. DETAIL OF GRADING OF BULB AREAS OF CUL-DE-SAC TO BE SHOWN ON PROFILE DRAWINGS.
2. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS THE BEGINNING OF THE BULB. MINIMUM DITCH GRADE TO BE 2%.
3. 1.50m CONCRETE SIDEWALK TO BE PLACED ON NORTH OR EAST SIDE OF ROAD.
4. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE
1	1.50m Concrete Sidewalk		05/23

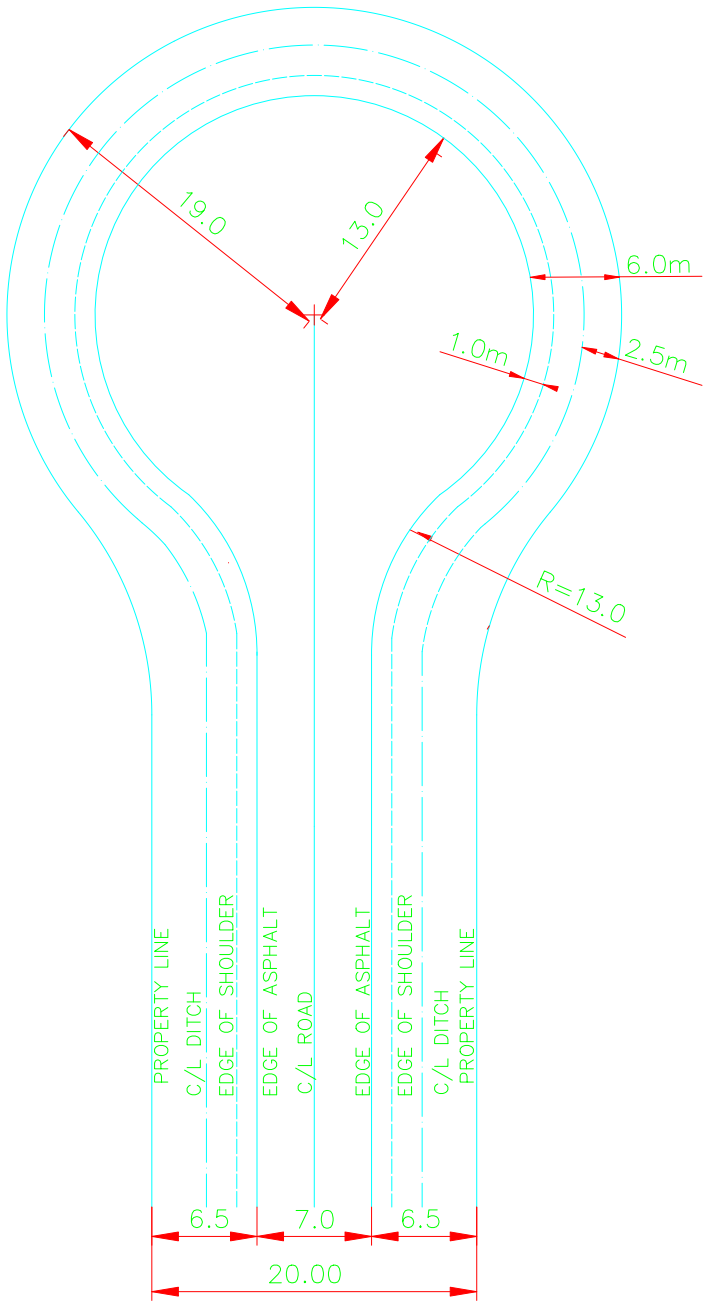
TOWNSHIP OF ORO-MEDONTE

URBAN RESIDENTIAL CUL-DE-SAC

20.0m ROAD ALLOWANCE
8.5m ASPHALT SURFACE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-03



NOTES:

1. DETAIL OF GRADING OF BULB AREAS OF CUL-DE-SAC TO BE SHOWN ON PROFILE DRAWINGS.
2. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS THE BEGINNING OF THE BULB. MINIMUM DITCH GRADE TO BE 2%.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE
1	ASPHALT BULB INCREASED TO 13.0m	DJS	08/2019

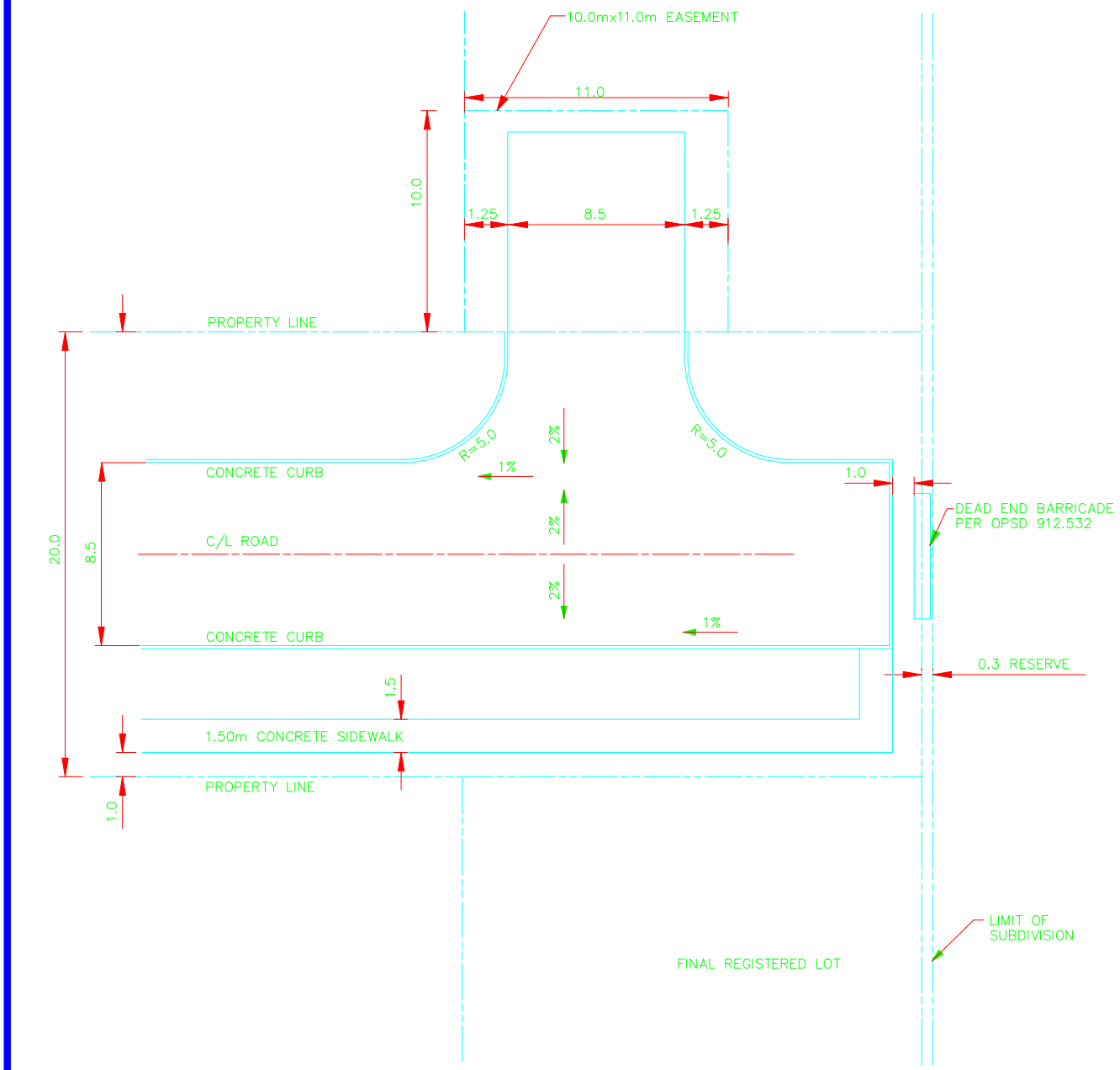
TOWNSHIP OF ORO-MEDONTE

LOCAL RESIDENTIAL CUL-DE-SAC

20.0m ROAD ALLOWANCE
7.0m ASPHALT SURFACE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-04



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. GUTTER TO BE DETAILED ON ENGINEERING DRAWINGS. MINIMUM GRADE TO BE 1%.
3. THE LOCATION OF 1.50m SIDEWALK TO BE DETAILED ON THE ENGINEERING DRAWINGS.
4. ALL CURB RADII ARE TO FACE OF CURBS.

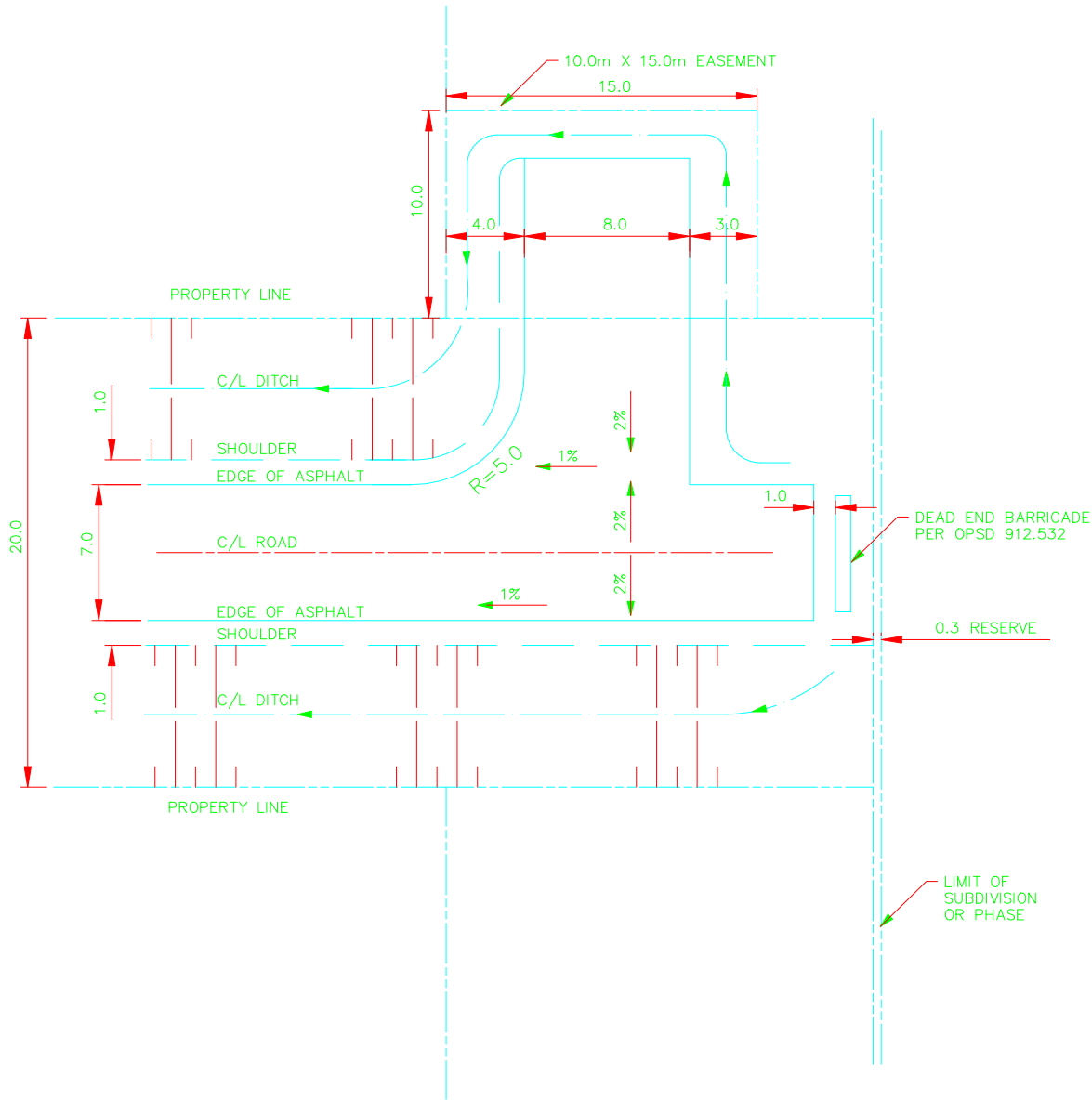
NO.	REVISION	APR'D	DATE
1	1.50m Concrete Sidewalk		05/23

TOWNSHIP OF ORO-MEDONTE

TEMPORARY TURNAROUND
URBAN RESIDENTIAL

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-05

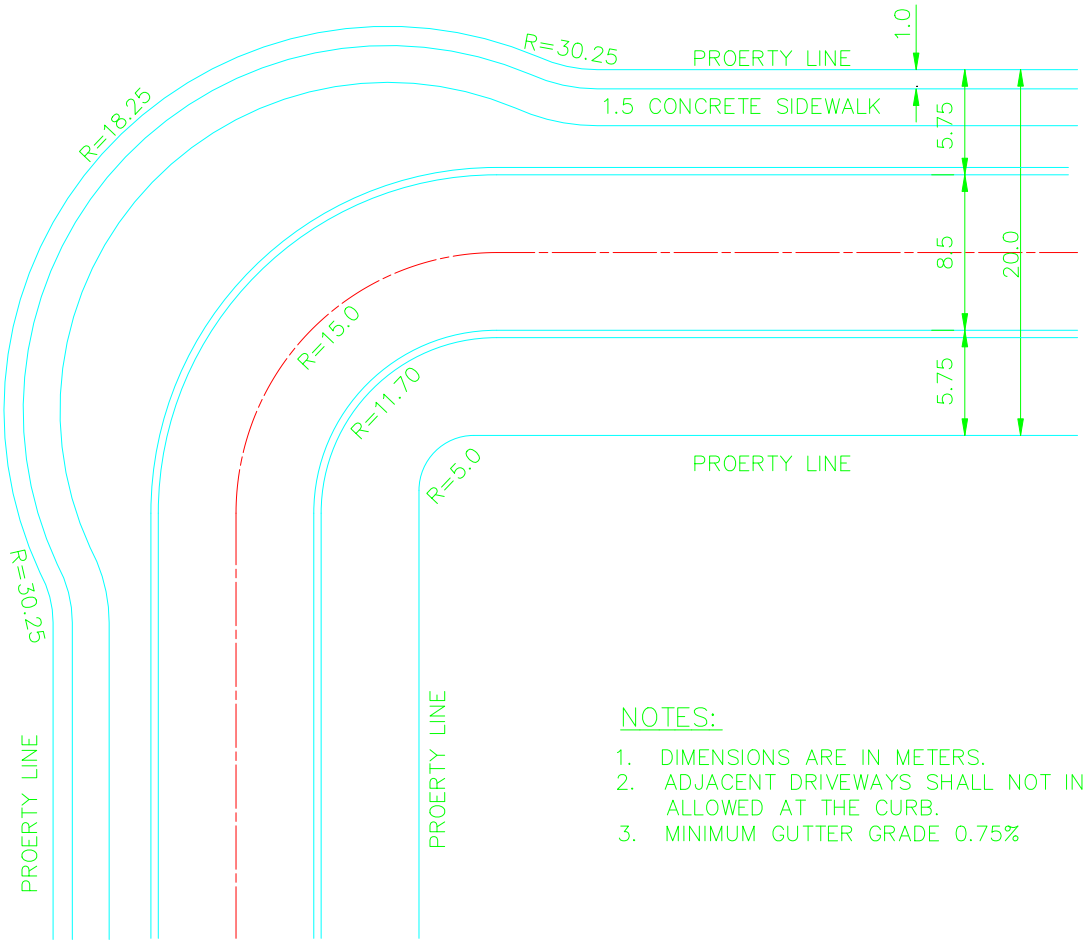


NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
TEMPORARY TURNAROUND LOCAL RESIDENTIAL	STD. No. 3.5-06	



NOTES:

1. DIMENSIONS ARE IN METERS.
2. ADJACENT DRIVEWAYS SHALL NOT INTERSECT ALTHOUGH DOUBLE ENTRANCES MAY BE ALLOWED AT THE CURB.
3. MINIMUM GUTTER GRADE 0.75%

NO.	REVISION	APR'D	DATE

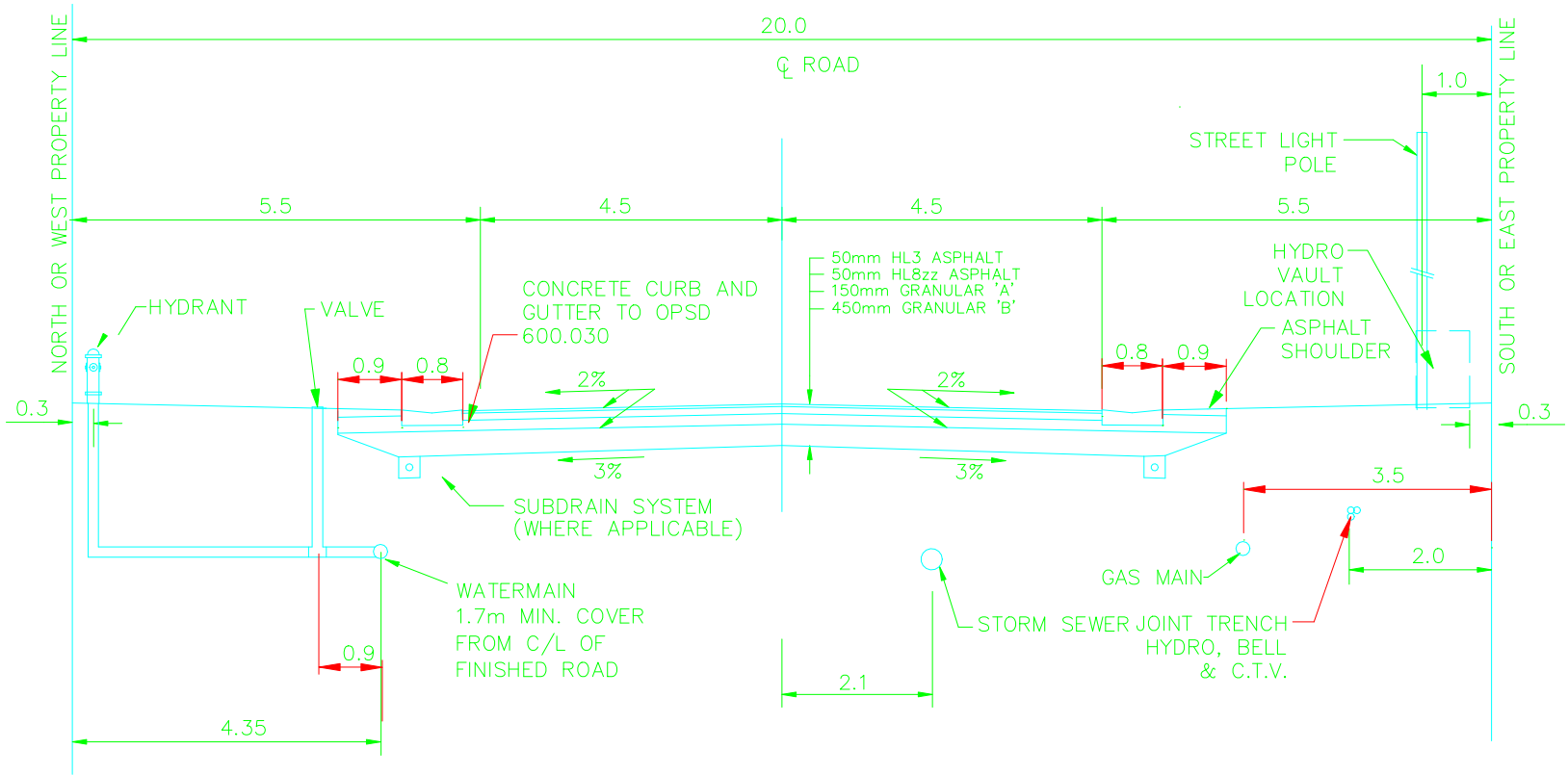
TOWNSHIP OF ORO-MEDONTE

90° BULB DETAIL

20.0m ROAD ALLOWANCE
6.6m ASPHALT SURFACE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-07



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. MINIMUM PAVEMENT AND ROAD STRUCTURE DESIGN AS PER THE TOWNSHIP OF ORO-MEDONTE DESIGN CRITERIA OR AS PER GEOTECHNICAL INVESTIGATION RECOMMENDATION.
3. ALL SERVICE LOCATIONS SHOWN ARE FOR GUIDELINE PURPOSES ONLY AND MAY DEVIATE AS PER THE DIRECTION OF THE TOWNSHIP WHEN STANDARD LOCATION CANNOT BE ACHIEVED.
4. WHERE ONE 1.50m CONCRETE SIDEWALK IS CONSTRUCTED IT SHALL BE ON THE NORTH AND EAST SIDE OF THE ROAD.
5. TREES TO BE PLACED IN LOCATIONS AS PER APPROVED LANDSCAPE PLAN.
6. HYDRO, BELL AND C.T.V. MAY RUN JOINT TRENCH AT STANDARD 2.0-2.6m OFFSET LOCATION. HYDRO, BELL, C.T.V. AND GAS TO HAVE 0.9m COVER.

NO.	REVISION	APR'D	DATE

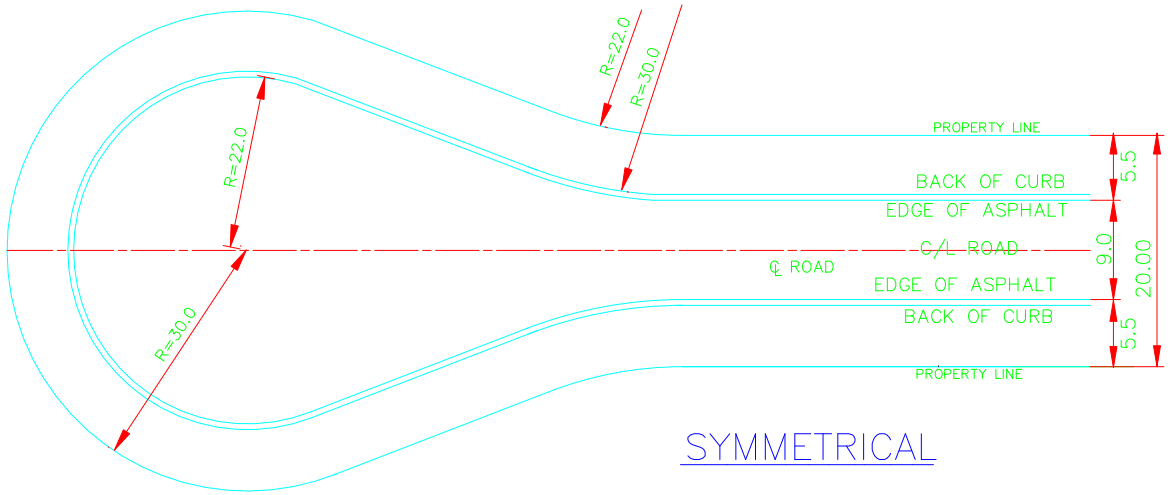
TOWNSHIP OF ORO-MEDONTE

LOCAL COLLECTOR and INDUSTRIAL

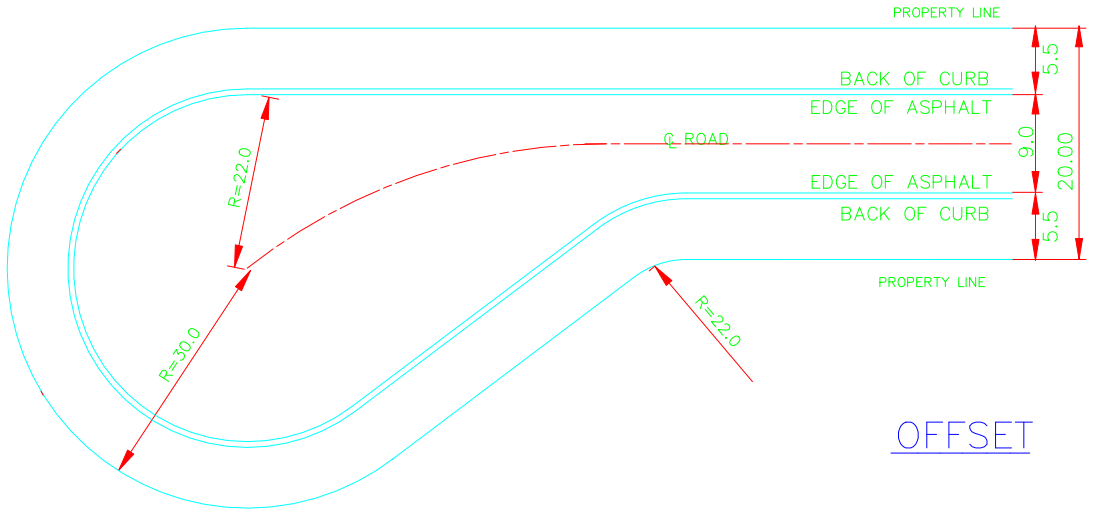
20.0m ROAD ALLOWANCE / 9.0M ASPHALT SURFACE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-08



SYMMETRICAL



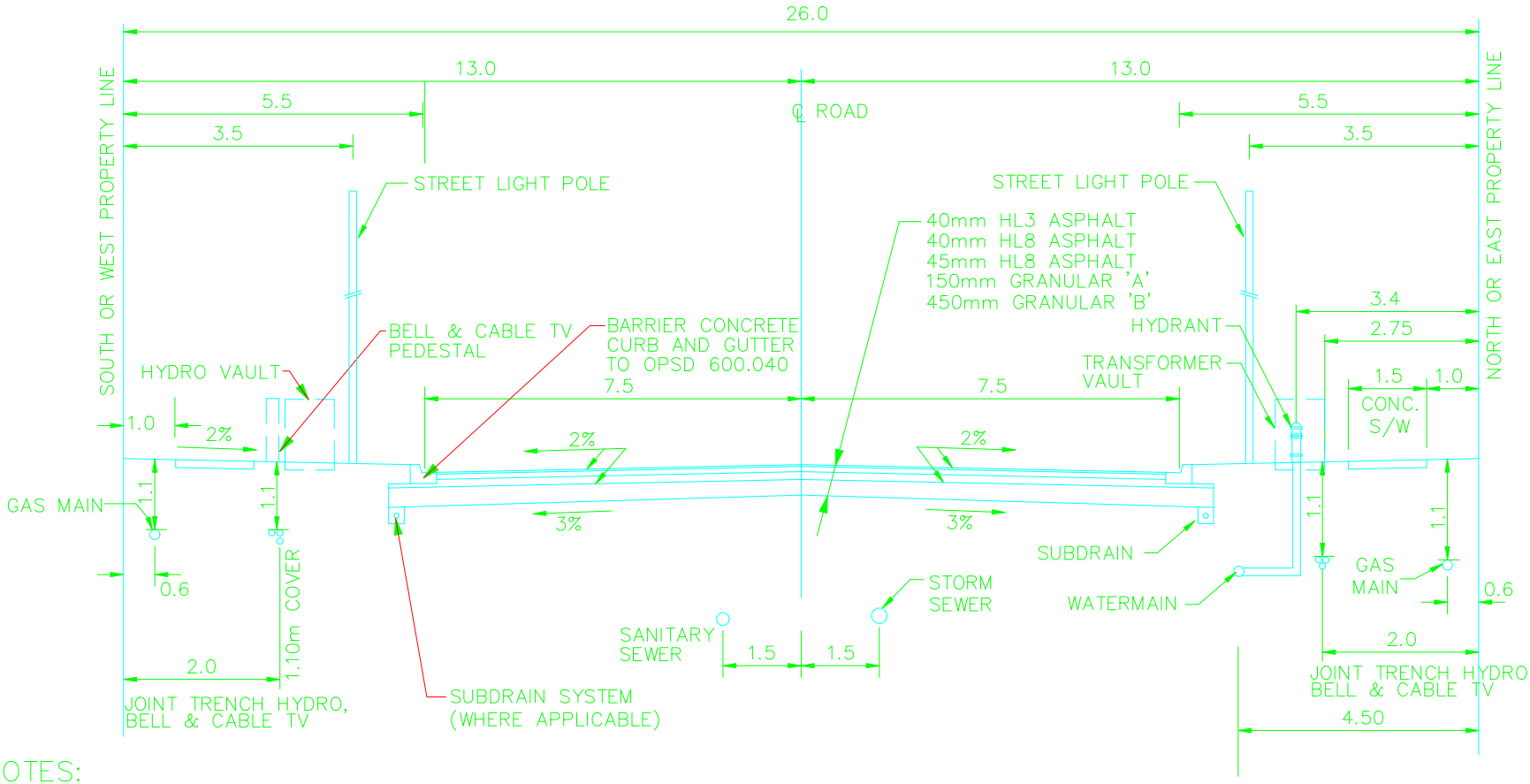
OFFSET

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN
2. MINIMUM GUTTER GRADE 0.75%
3. CUL-DE-SAC DRAINAGE TO BE DIRECTED TOWARDS BEGINNING OF BULB.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
INDUSTRIAL CUL-DE-SAC 26.0m ROAD ALLOWANCE 7.0m ASPHALT SURFACE	STD. No. 3.5-09	



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. MINIMUM PAVEMENT AND ROAD STRUCTURE DESIGN AS PER THE TOWNSHIP OF ORO-MEDONTE DESIGN CRITERIA OR AS PER GEOTECHNICAL INVESTIGATION RECOMMENDATION.
3. ALL SERVICE LOCATIONS SHOWN ARE FOR GUIDELINE PURPOSES ONLY AND MAY DEVIATE AS PER THE DIRECTION OF THE TOWNSHIP WHEN STANDARD LOCATION CANNOT BE ACHIEVED.
4. WHERE 1.50m CONCRETE SIDEWALK IS CONSTRUCTED IT SHALL BE ON THE NORTH AND EAST SIDE OF THE ROAD.
5. TREES TO BE PLACED IN LOCATIONS AS PER APPROVED LANDSCAPE PLAN.
6. HYDRO, BELL AND C.T.V. MAY RUN JOINT TRENCH AT STANDARD 2.0-2.6m OFFSET LOCATION. HYDRO, BELL, C.T.V. AND GAS TO HAVE 0.9m COVER.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

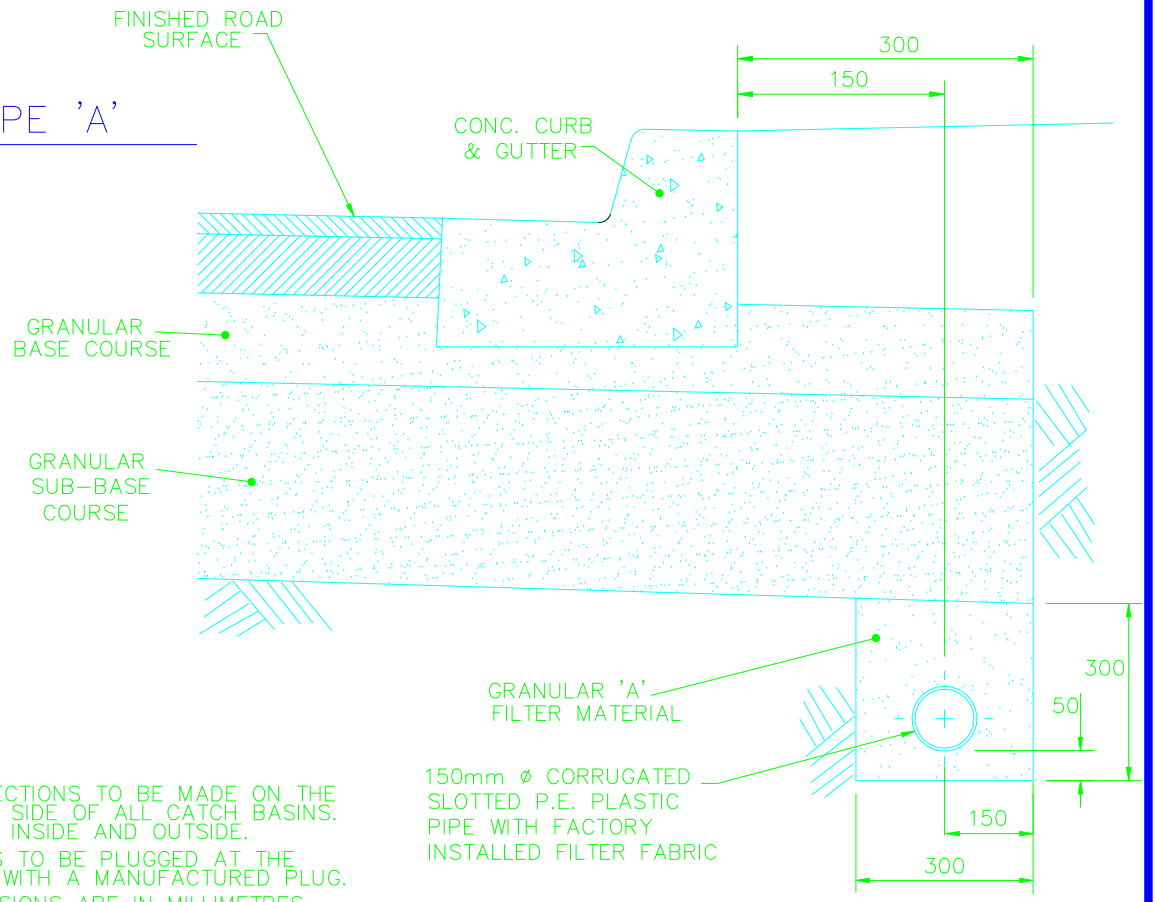
MAJOR COLLECTOR and INDUSTRIAL

26.0m ROAD ALLOWANCE / 15.0m ASPHALT SURFACE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-10

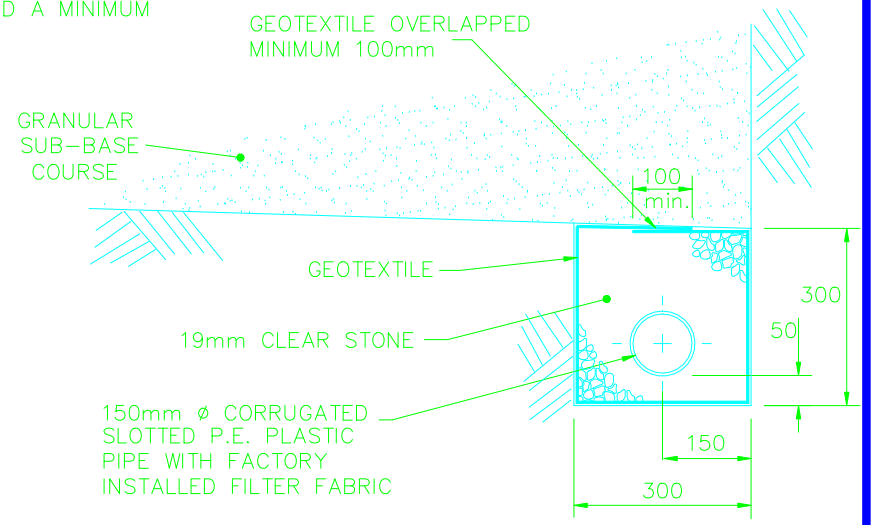
TYPE 'A'



NOTES:

1. ALL CONNECTIONS TO BE MADE ON THE UPSTREAM SIDE OF ALL CATCH BASINS. MORTARED INSIDE AND OUTSIDE.
2. SUBDRAINS TO BE PLUGGED AT THE HIGH END WITH A MANUFACTURED PLUG.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
4. OPTION 'B' : THE SUBDRAIN TRENCH SHALL BE LINED WITH CLASS II, NON-WOVEN GEOTEXTILE, WITH AN F.O.S. OF 75-150 um AND A MINIMUM THICKNESS OF 1mm.

TYPE 'B'



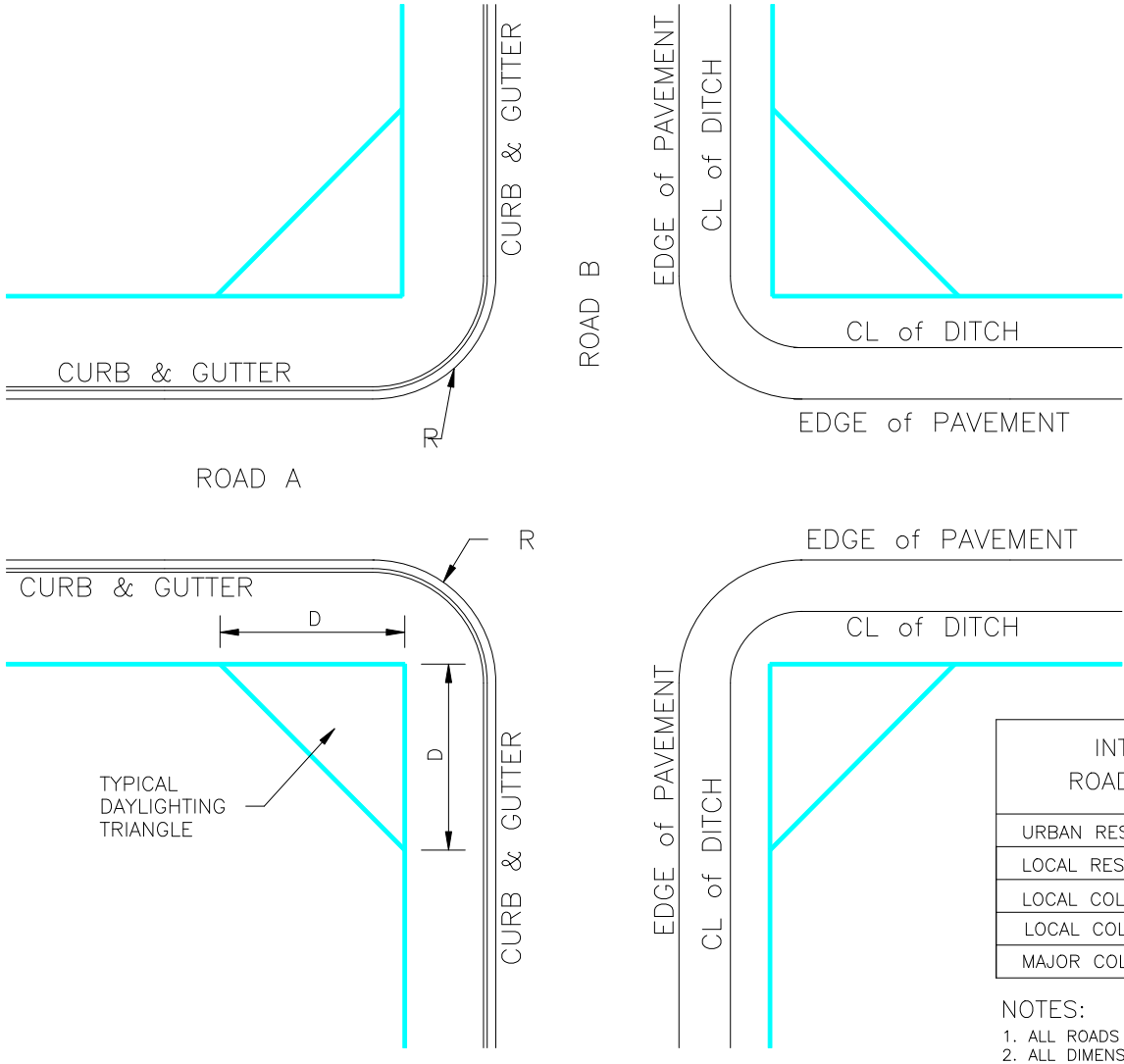
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

150mmø SUBDRAIN DETAIL

STD. No. 3.5-11



From TABLE –1–

INTERSECTION TYPE ROAD "A" TO ROAD "B"	CURB R	D
URBAN RESIDENTIAL TO URBAN RESIDENTIAL	10.0	5
LOCAL RESIDENTIAL TO LOCAL RESIDENTIAL	12.5	5
LOCAL COLLECTOR TO LOCAL COLLECTOR	12.5	15
LOCAL COLLECTOR TO MAJOR COLLECTOR	15.0	15
MAJOR COLLECTOR TO MAJOR COLLECTOR	18.0	18

NOTES:
1. ALL ROADS TO INTERSECT AT 90°.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

TYPICAL INTERSECTION REQUIREMENTS

APR'D:
DRAWN:
DATE: 04 / 2018
SCALE: NTS

STD. No. 3.5–12

ROADS

A) SUBGRADE AND BOULEVARD MATERIAL TO BE COMPACTED TO A MINIMUM DRY DENSITY OF AT LEAST 95% SPMDD. SUBGRADE TO BE PROOF ROLLED AND CERTIFIED PRIOR TO PLACING GRANULAR 'B'.

B) GRANULAR 'A' AND 'B' BASE TO BE COMPACTED TO 100% OF THE MATERIAL'S RESPECTIVE SPMDD.

C) ROADWAYS TO BE CONSTRUCTED WITH MIN. 300MM GRANULAR 'B' TYPE 1, 150 MM GRANULAR 'A', AND 50 MM HL8 BASE 40 MM HL3 SURFACE COURSE ASPHALT. ALL SUBDRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSS 405.

D) SELECT SUBGRADE MATERIAL, OR IMPORTED GRANULAR MATERIAL APPROVED BY THE ENGINEER, COMPACTED TO 98% S.P.M.D.D. TO BE USED AS FILL IN ALL AREAS WHERE PROPOSED PIPE INVERTS ARE HIGHER THAN EXISTING GRADE OR AS INSTRUCTED BY THE ENGINEER.

E) ALL GRANULARS AND ASPHALT MATERIALS AND PLACEMENT TO BE IN ACCORDANCE WITH OPSS 314 AND OPSS 310

F) JOINTS WITH EXISTING ASPHALT TO BE SAW CUT STRAIGHT PRIOR TO PLACING ASPHALT AND DENSO TAPE APPLIED TO EXISTING ASPHALT.

G) STOP SIGNS AND STREET SIGNS TO TOWNSHIP STANDARDS.

H) REINSTATEMENT OF ALL DISTURBED BOULEVARDS TO INCLUDE REGRADING, 100mm TOPSOIL AND SOD TO OPSS 570 AND 571.

I) CONCRETE CURB AND GUTTER TO OPSD 600.030 OR OPSD 600.070 AND OPSS 353

J) 1.50m CONCRETE SIDEWALK TO OPSD 310.010, 310.030 AND OPSS 351. SUBBASE TO CONSIST OF MINIMUM 150 mm OF GRANULAR 'A'.

K) 150 mm DIAMETER PIPE SUBDRAINS SHALL BE PROVIDED AS PER TOWNSHIP of ORO-MEDONTE STANDARD DETAILS 3.5-01, 3.5-08 or 3.5-10 AS APPLICABLE AND ON BOTH SIDES OF THE ROAD WHERE APPLICABLE.

L) SUBDRAIN TO BE INSTALLED 200 mm BELOW CURB IN GRANULAR 'A' TRENCH AND CONNECTED TO EACH CB OR CBMH.

M) SUBDRAINS TO BE PERFORATED OTHER THAN THE 2.0 m SECTION IMMEDIATELY UPSTREAM OF ALL STRUCTURES WHICH SHALL BE NON-PERFORATED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

NOTES - ROADS

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.5-13

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3.6 Erosion and Sediment Control Measures

Prior to commencement of any work on site, the Developer is required to implement an Erosion and Sediment Control Plan (ESCP) consisting of a report and drawing(s) as required, to be approved by the Township and appropriate Conservation Authority.

Erosion and sediment control measures shall be designed in accordance with the Township of Oro-Medonte Standard Details 3.6-01 through 3.6-05.

Additional requirements may be necessary where creek or stream crossings for underground services, bridge or culvert construction across active streams, channel diversions and outfalls to active streams are encountered. Plans shall outline measures to reduce impact on the streams including the timing of construction activities to minimize disruption as required by NVCA, LSRCA, MNRF and DFO, where applicable.

3.6.1 Erosion and Sediment Control Plan (ESCP) Measures and Requirements

The ESCP shall address specific requirements for each stage of construction as follows:

- Tree removal
- Clearing and grubbing
- Topsoil stripping and rough grading
- Construction of services
- Road and building construction

The ESCP shall be designed and implemented in order to effectively reduce on-site erosion and prevent off-site transport of silt, both overland and via the municipal storm sewer system, or into treed and / or environmentally sensitive areas within or external to the development. The ESCP shall include provision to minimize windblown dust and to minimize and manage mud tracking on to adjacent roads.

- **All** erosion and sediment controls are temporary measures constructed prior to other site work which shall be maintained until assumption of the subdivision. Prior to assumption of the subdivision **all** temporary measures shall be removed and **all** disturbed areas stabilized.
- **All** Silt and Sediment Control Fence shall be maintained on a regular basis.

- **All** erosion and sediment control devices are to be inspected by the Developer's Consulting Engineer once per month and after each rainfall of 1 cm or greater to ensure that they are in proper working condition.
- A permanent record of these inspections shall be kept and an inspection report forwarded to the Manager of Development Engineering as part of the monthly Site Inspection and Reporting.
- **All** disturbed ground left inactive shall be stabilized by seeding, sodding, mulching, or covering, or other equivalent control measure. The period of time of inactivity shall not exceed thirty (30) days, unless otherwise authorized by the Township.
- **All** activities on the site shall be conducted in a logical sequence to minimise the area of bare soil exposed at any one time.
- The phasing of individual developments shall be taken into account during the design of the control measures including locations for topsoil stockpiles. A primary consideration shall be to expose the least possible area of land for the shortest possible timeframe.

3.6.1.1 Silt and Sediment Control Fence

Silt and Sediment Control Fence shall be installed along **all** down-slope sides of a site along the edges of a drainage channel passing through the site, and along the perimeter of **all** other areas sensitive to sediment accumulation.

Silt and Sediment Control Fence shall be installed wherever surface runoff drains onto adjacent properties, completely around the base of topsoil stockpiles and along the perimeter of **all** other areas sensitive to sediment accumulation (e.g. watercourses, valleys, woodlots, areas to remain undisturbed etc.).

All Silt and Sediment Control Fence installation shall be constructed in accordance with Township of Oro-Medonte Standard Drawings STD. No. 3.6-01 - Light Duty Silt Barrier Fence or STD. No. 3.6-02 - Heavy Duty Silt Barrier Fence.

3.6.1.2 Topsoil Stockpile Protection

Runoff shall be controlled by Silt and Sediment Control Fence or other approved measures and devices.

If the Stockpile is to remain for more than 30 days, Stockpiles shall be stabilized by vegetative cover, or other means.

All Stockpiles containing more than 100m^3 of material shall be located a minimum of 10m away from a roadway, drainage channel or an occupied residential lot.

The maximum side-slopes for topsoil stockpiles shall be 5 horizontal to 1 vertical. The maximum Stockpile height shall be approved by the Township in consideration of the surrounding land uses and duration the Stockpile is to be in place.

3.6.1.3 Temporary Sediment Basins

Sediment Basins shall be constructed on sites having a disturbed drainage area of greater than two (2) hectares.

Temporary Sediment Basins may also be required for sites smaller than two (2) hectares where watercourses or environmentally sensitive areas have been identified or those having an average slope greater than 12%.

Temporary Sediment Basins shall be designed to settle out particles that are 0.04 mm in diameter or larger from surface water runoff and storm sewer flows and shall be sized to meet LSRCA criteria of minimum 125 m^3/ha, 24hr detention and 125 m^3/ha permanent pool storage volume or the ultimate pond criteria.

Temporary Sediment Basins are to have filter fabric / clear stone wrapped perforated riser outfalls with anti-seepage collars and rip rap overflow weirs.

3.6.1.4 Catchbasin Sediment Control

All catchbasins shall be provided with a sediment control barrier.

Sediment removal is required when the depth from the underside of frame to top of the accumulated sediment is reduced to 300mm.

Under appropriate drainage circumstances, **all** non-low point roadside catchbasins shall be provided with sediment protection by double wrapping the catchbasin grate with a woven geotextile. **All** low point catchbasins shall utilise alternative sediment control measures so that the drainage outlet is not completely blocked.

Regular weekly cleanings of the sump or the use of sediment bag shall be undertaken for these catchbasins.

All Catchbasin Sediment Controls shall be inspected by the Developer's Consulting Engineer once per week and after each rainfall of 1 cm or greater and maintained on a regular basis.

3.6.1.5 Stone Pad Construction Entrance / Access (Mud Mat)

In order to reduce the tracking of mud onto a paved road, a pad of crushed stone shall be constructed at the site entrance and exit leading onto any existing road. The stone pad shall be a minimum of 450mm thick, 30m long and 5m wide. The first 15m from the entrance/exit shall be constructed with 50mm clear stone. The remaining 15m shall be constructed with 150mm riprap.

This stone pad shall be maintained as required given the site conditions to ensure mud tracking is kept to a minimum. In some cases, the drawings shall specify a **mandatory** truck haul route.

3.6.1.6 Rock Check Dams

To be installed in swales and ditches in accordance with OPSD 219.210 and 219.211 where runoff drains to adjacent properties or to prevent silt and sediment migration within the site as required.

3.6.1.7 Vegetative Buffer Strips

A minimum 3m wide vegetative buffer strip shall be provided along the limits of the development adjacent to existing road boulevards and existing residential properties. Where a sediment control fence is required, it shall be constructed in front of the buffer strip.

3.6.2 Drawings and Report Requirements

3.6.2.1 Drawings

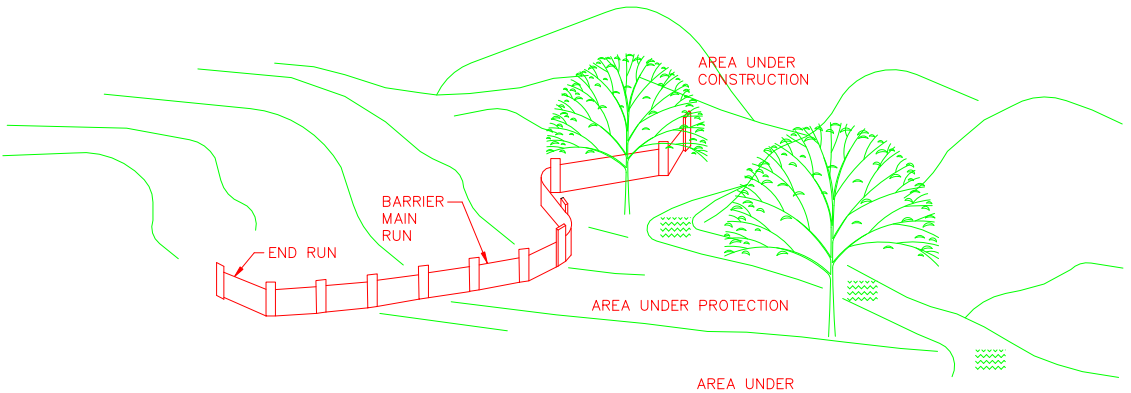
ECSP Drawings shall be comprised of, and include the following:

- Scale at 1:500 or 1:1000
- Location of buildings, existing and proposed, within and adjacent to the property
- **All** natural features within and adjacent to the property (woodlots, watercourses, valley lands etc.)
- Trees to be preserved
- Existing contours at 0.5 m intervals
- Proposed interim and final elevations
- Areas to be disturbed
- Direction of overland flow
- Staging of construction and implementation of control measures
- Proposed erosion and sediment control measures (silt fence, rock check dams, sediment basins, interceptor swales, stone mud mats, straw bales, etc.)
- Topsoil stockpile locations with estimated quantities, max. height and angle of side slopes
- Detail drawings

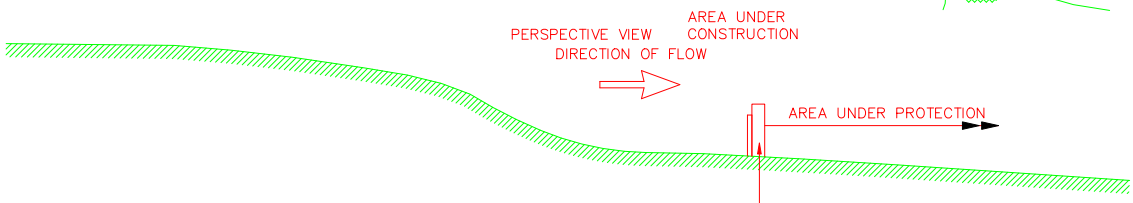
3.6.2.2 Report

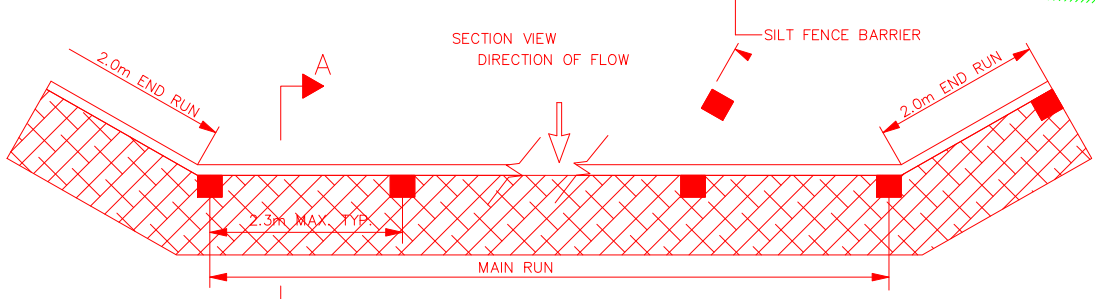
A brief report shall accompany the drawings which, at a minimum, outline staging of construction and implementation of the proposed erosion and sediment control measures, a description of measures to be undertaken, silt basin calculations, features to be protected and an inspection and maintenance program.

The report shall also recommend measures to control dust such as road cleaning, watering, work restrictions on windy days, minimizing disturbed areas and other measures.

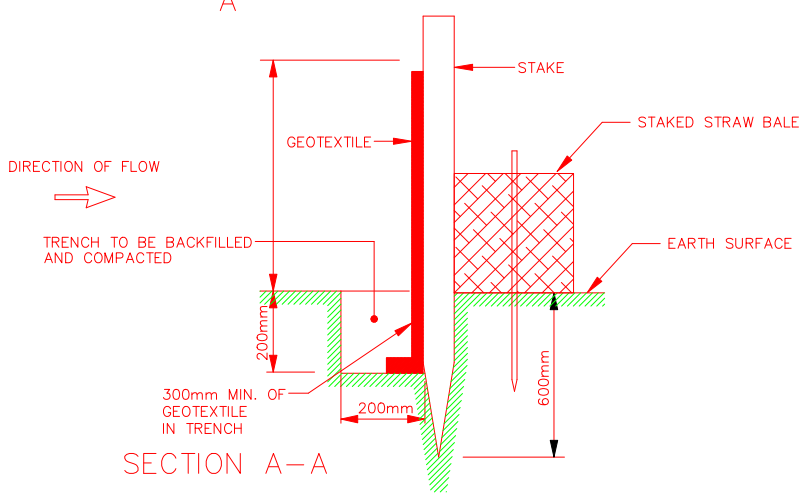


PERSPECTIVE VIEW





PLAN OF SILT FENCE BARRIER



SECTION A–A

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:

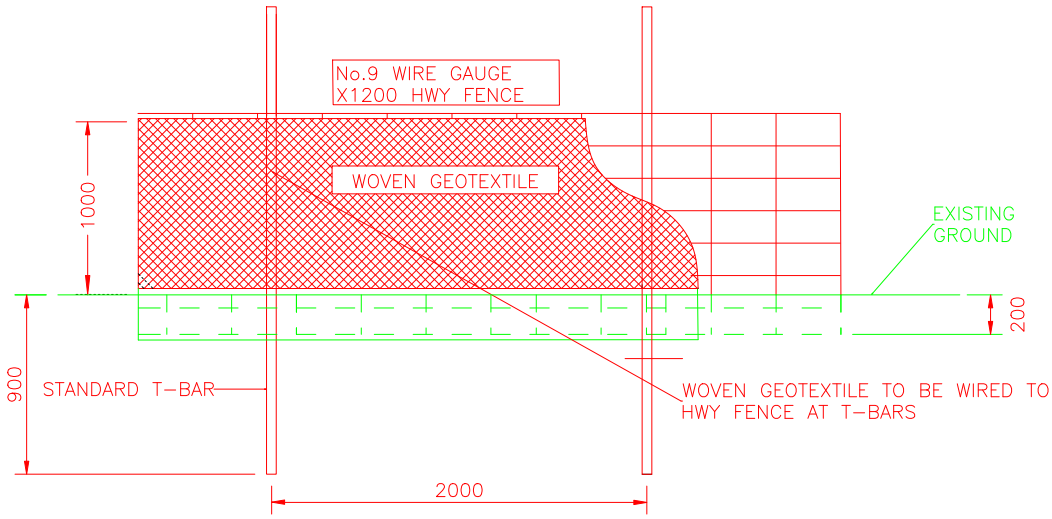
DATE: 03 / 2016

DRAWN:

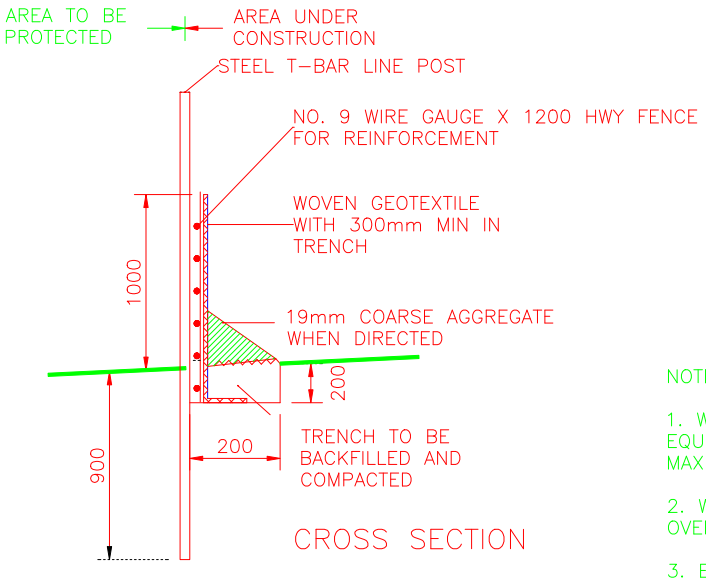
SCALE: NTS

LIGHT DUTY SILT FENCE BARRIER

STD. No. 3.6–01



ELEVATION



CROSS SECTION

NOTES:

1. WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm

2. WOVEN GEOTEXTILE TO HAVE A HORIZONTAL OVERLAP OF 1000mm AT JOINTS.

3. END RUNS SHALL BE TURNED UPSTREAM AT 30°

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

APR'D:

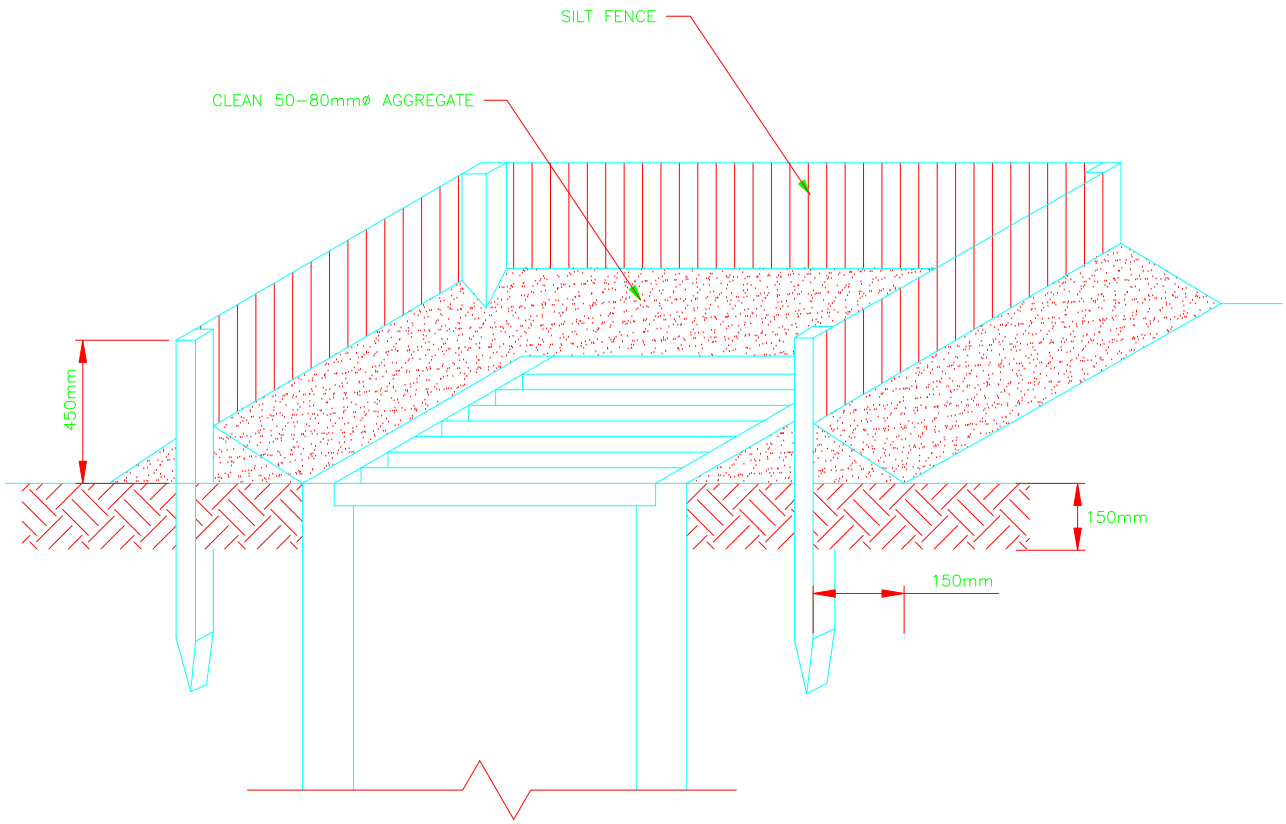
DRAWN:

DATE: 03 / 2016

SCALE: NTS

HEAVY DUTY SILT FENCE BARRIER

STD. No. 3.6-02



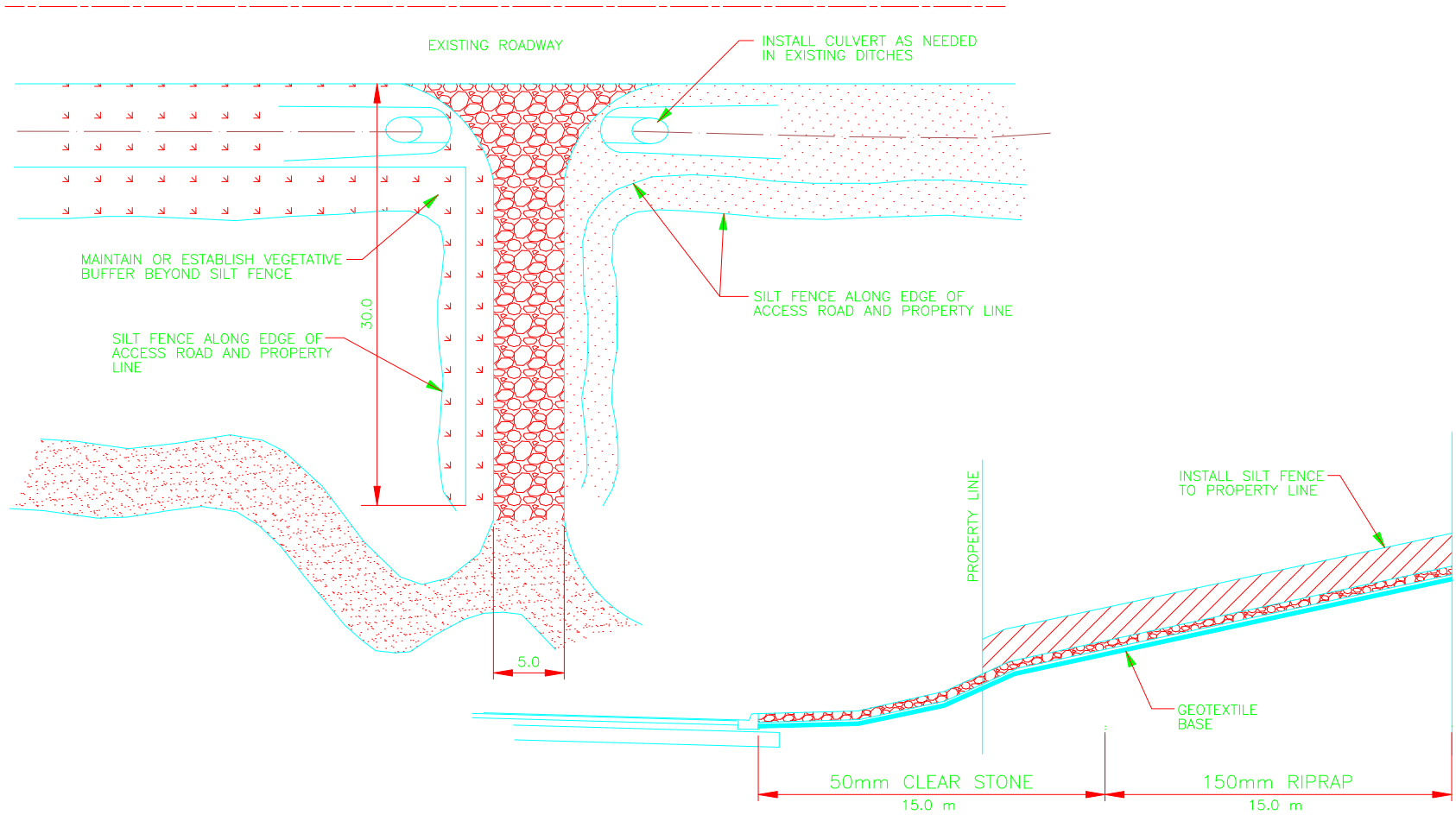
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

SEDIMENT CONTROL MEASURE AT CATCHBASINS AND CATCHBASIN MANHOLES

STD. No. 3.6–03



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
2. PURPOSE OF CONSTRUCTION MAT IS TO MINIMIZE TRANSPORTATION OF SEDIMENT ONTO ROADWAYS.
3. CONSTRUCTION MAT IS TO BE INSTALLED AS THE FIRST STEP IN THE SITE ALTERATION PROCESS.
4. CONSTRUCTION MATS ARE REQUIRED WHERE PAVED ROADS ARE WITHIN 300m OF THE SITE.

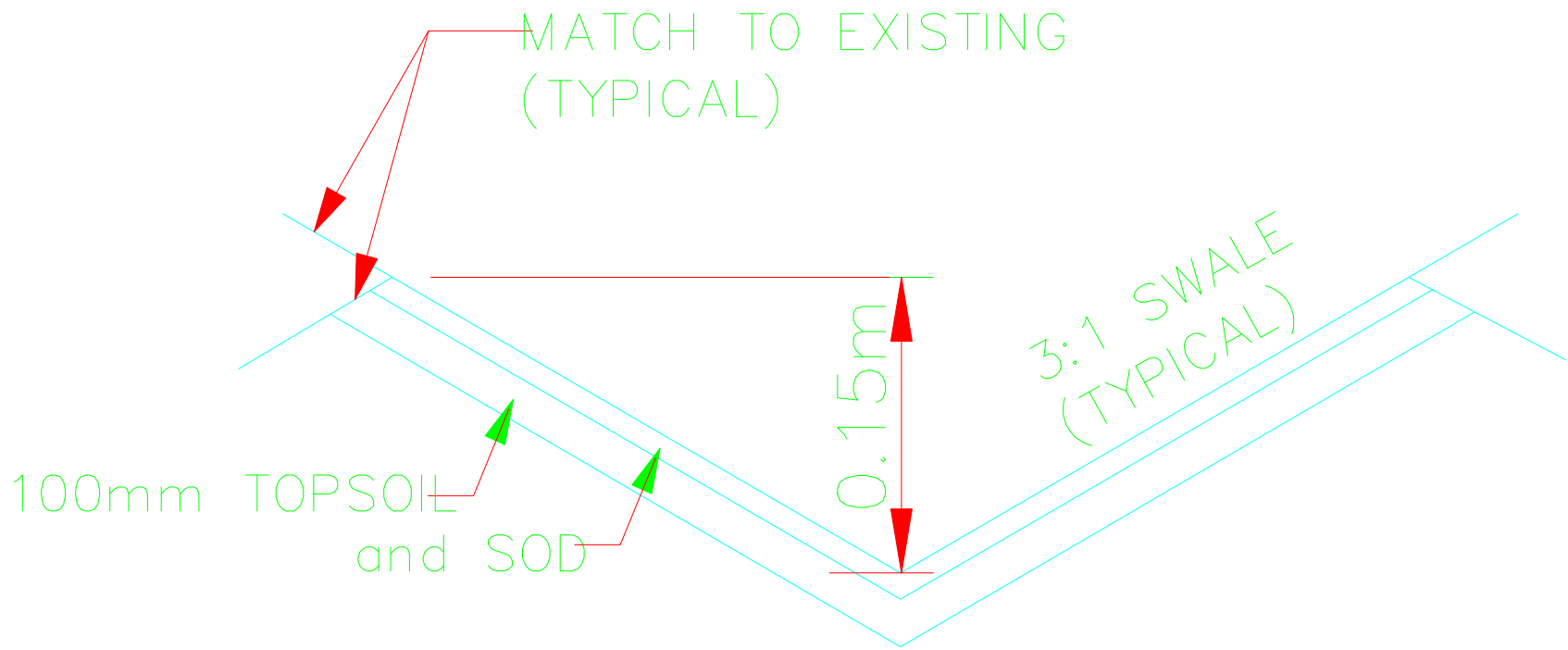
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

CONSTRUCTION ENTRANCE MAT

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.6-04



TYPICAL SWALE DETAIL

SCALE: NTS

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

TYPICAL SWALE DETAIL

APR'D:	DATE: 07 / 2017
DRAWN:	SCALE: NTS

STD. No. 3.6-05

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3.7 Stormwater Management

The Township has set out the following objectives for effective stormwater management infrastructure design and construction:

- Prevent loss of life and minimize impact to adjacent properties
- Prevent inconvenience from surface ponding and flooding
- Prevent adverse impacts on the local groundwater systems and base flows in receiving watercourses
- Prevent downstream flooding and erosion
- Prevent pollution discharges to watercourses / waterbodies
- Prevent soil losses and sediments to enter sewer systems and watercourses / waterbodies resulting from construction activity
- Prevent impairment of aquatic life and habitat
- Promote orderly development in a cost-effective manner.

Stormwater management requirements generally shall reflect distinct solutions and vary depending upon the watershed, and in some cases the storm sewer shed, that the site is located. Site-specific requirements can be obtained from the Township. A stormwater management report shall be required for **all** development applications.

Site specific stormwater management reports shall be consistent with **all** applicable background reports prepared by the Township or Conservation Authority (i.e. Watershed Planning Studies, Master Drainage Plans, Stormwater Management Master Plan, etc.), including the Lake Simcoe Protection Plan and the Township of Oro-Medonte Comprehensive Stormwater Master Plan.

In general, stormwater management reports shall address the following:

- stormwater quantity and quality
- sediment and erosion control and base flow maintenance
- Stormwater Management Pond Planting Plan

3.7.1 Quantity Control

The Township implements a Major and Minor system approach to stormwater conveyance and control, comprised as follows:

- *Minor (conveyance) System* - 5-year return period – storm sewers, catch basins, driveway culverts and surface swales.
- *Major (overland) System* - 100-year return period – streams, valleys, man-made channels, roadways, roadside ditches, and ponds.

In general, quantity control measures are to be designed in accordance with the MECP Stormwater Management Planning and Design Manual and / or the latest version of NVCA or LSRCA criteria where applicable.

In addition to introducing pond storage into a stormwater management system, increased flows resulting from increased impervious areas may be mitigated by utilizing measures such as: discharging rainwater leaders onto grassed areas, providing temporary rooftop and parking lot storage, or using grassed swales rather than piped flow.

Other factors, such as snowmelt run-off with large volume and longer duration and potential adverse downstream effects due to uncoordinated timing of peak flows shall be considered when designing stormwater management facilities.

Underground storage tanks and ‘super pipe’ systems for stormwater storage are discouraged as part of the Township system due to inherent long term, high replacement and maintenance costs and **may** only be considered in exceptional cases and typically on in I.C.I. Site Plan developments.

Joint use facilities i.e. detention ponds over recreational playing fields and passive parks, **may** be considered on an individual basis subject to suitably designed control measures and the intended park use.

The degree of control on the quantity of run-off from a proposed development shall be as follows:

- The post-development peak flow shall not be greater than the corresponding pre-development peak flow for the 1 : 5 year, 1 : 10 year, 1 : 25 year and 1 : 100-year storms. Other regulatory agencies may require other storm flows to be analyzed (i.e. 2 year and/or Regional flows).

3.7.2 Runoff Quantity

- Rural Catchments – shall be modelled with OTTHYMO using the SCS 24 hr design storm to generate peak flow value.
- Urban Catchments – shall be modelled with OTTHYMO using the Chicago 4 hr design storm.

In general, the **SCS Design Storms** shall be used for determining the hydrographs for undeveloped / rural watersheds and for checking detention storages required for quantity control.

The **Chicago Design Storms** shall be used for determining hydrographs in urban areas and also for checking detention storage. In most cases, the Developer's Consulting Engineer shall be required to run both sets of design storms to make sure that the more stringent is used for each individual element of the drainage system (pipe flow, road flow, channel flow, detention storage).

The time step for discretization of the design storm can vary according to the size of the sub-watershed but shall not exceed the estimated time of concentration. The maximum rainfall intensity shall be compatible with that of real storms on record.

All parameter assumptions used in the OTTHYMO input shall be clearly identified in the stormwater management report.

3.7.3 Quality Control

In general, water quality controls are to be designed in accordance with the MECP Stormwater Management Planning and Design Manual – (as amended), MECP Design Criteria for Sanitary Sewers, Storm Sewers and Force Mains for Alterations Authorized Under Environmental Compliance Approval (as amended) the Lake Simcoe Protection

Plan and NVCA or LSRCA criteria, as applicable. Prior to initiating design, the Developer's Consulting Engineering shall contact the Township for acceptability of specific measures in consideration of long-term maintenance and effectiveness.

3.7.4 Watershed Area

The watershed area shall be determined from contour plans and shall include **all** areas that naturally drain into the system and any fringe areas not accommodated in adjacent storm drainage systems, as well as other areas which may become tributary by reason of regrading. This information shall be confirmed with the Manager of Development Engineering prior to the start of the design of the internal servicing of the site.

3.7.4.1 External Catchment Areas

A plan shall be prepared to a scale of 1 : 1,000 to 1 : 2,000 depending on the size of the watershed area, to show the nature of the drainage of the lands surrounding the development site and to show **all** external drainage areas that are contributory to the drainage system for the development.

The external drainage areas shall be divided into smaller tributary areas and the area and the location to which the tributary area is considered to drain in the design shall be clearly shown.

The plan shall clearly show **all** existing contours used to justify the limits of the external drainage areas.

The uses as identified in the latest Zoning By-law and Official Plan shall be used to determine the correct values of the run-off parameters for **all** external areas in the design and to determine the specific areas to which these values apply in lieu of precise information on development as a whole or any part of a watershed area.

This external drainage area plan shall be prepared and shall be submitted to the Manager of Development Engineering at the functional report stage and prior to the commencement of the detailed storm sewer design.

3.7.4.2 Internal Catchment Areas

An internal storm drainage plan shall be prepared to a scale of 1:1,000 and shall include **all** roads, lots, blocks, and other lands within the development.

The proposed storm sewer system shall be shown on this plan with **all** maintenance holes numbered consecutively from the outlet.

These maintenance holes shall be the tributary points in the design and the area contributing to each maintenance hole shall be clearly outlined on this plan.

The area, in hectares, of each contributing area (to the nearest hundredth) and the run-off parameter used shall be shown in a circle located within the contributing area.

In cases where areas of different run-off parameters may be tributary to the same maintenance hole, the areas and the parameters shall be separately indicated on the plan.

In determining the tributary area to each maintenance hole, the proposed grading of the lots shall be considered to maintain consistency in the design.

In the case of large areas under single ownership or blocks requiring future site plan agreements, the design shall be prepared on the basis of the whole area being contributory to one maintenance hole in the abutting storm sewer. Should more than one private storm connection be necessary to serve the property, the appropriate area tributary to each connection shall be clearly shown and taken into account in the storm sewer design.

The storm drainage plan shall indicate but not be limited to the following:

- existing contours
- drainage patterns of adjacent lands
- runoff coefficients and areas (ha) of tributary areas outside the development and for each section of the storm sewers within the development
- direction of runoff

- road names
- maintenance hole numbers
- sewer sizes, slope, and directions of flow
- any catch basins or swales, on the lots or blocks, required to collect the runoff
- temporary or permanent quantity and quality stormwater management facilities
- major and minor overland flow routes
- culverts and other drainage appurtenances

3.7.5 Stormwater Pond Requirements

The design of stormwater management ponds shall be completed with consideration of the following aesthetic and landscape design criteria:

- Stormwater management dry ponds shall be designed to limit the maximum depth of water to 1.8 m above the lowest point of the stormwater basin. An additional 0.3 m freeboard is required above the maximum flood level. The maximum depth of the extended detention zone shall not exceed 1.0 m above the lowest point of the pond.
- Maximum side slope shall be 5:1 from the bottom of the dry pond to the limit of maximum extended detention, with a minimum horizontal length of 3.0 m. The minimum allowable gradient on the bottom of the basin shall be 1.0% and the maximum gradient shall be 5%.
- Stormwater management wetlands shall be designed to limit the maximum depth of water to 2.1 m above the lowest point of the stormwater basin excluding micro-pools. An additional 0.3 m freeboard is required above the maximum flood level.
- The maximum depth of the extended detention zone shall not exceed 1.0 m above the permanent pool elevation. Maximum peak flow attenuation zone shall not exceed 1.8 m above the permanent pool elevation.
- The permanent pool depth shall range between a minimum depth of 0.15 m to a maximum depth of 0.45 m.
- A maximum 5:1 slope below the permanent pool level shall be permitted around the entire stormwater management wetland. A maximum 5:1 slope above the permanent pool level shall be permitted around the entire stormwater management

wetland. The slope shall extend from the permanent pool level to the limit of maximum extended detention. The horizontal distance of this slope shall be a minimum of 3.0 m.

- Stormwater management wet ponds shall be designed to limit the maximum depth of water to 3.3 m above the lowest point of the stormwater basin. An additional 0.3 m freeboard is required above the maximum flood level. The maximum depth of the extended detention zone shall not exceed 1.0 m above the permanent pool elevation. The permanent pool depth shall range between a minimum depth of 1.0 m to a maximum depth of 1.5 m.
- A maximum 5:1 slope shall be permitted around the entire stormwater management wet pond. The slope shall extend from the bottom of the permanent pool to the limit of maximum extended detention.
- Where stormwater management facilities to be owned by the Township, fencing shall be required at the discretion of the Township. At a minimum, demarcation of property boundaries is required. Fencing, signage and/or property demarcation shall be to Township Standards.
- In situations where existing natural areas are proposed to be used for stormwater management, exemptions to the depth and slope criteria may be provided to minimize disturbance to the natural feature, at the discretion of the Township.
- Designed pedestrian access areas shall not exceed a maximum slope of 12:1.
- Notwithstanding the above slope and depth criteria, in the case of headwall design, the depth of water related to adjoining side slopes may vary and fencing is required for safety purposes.
- Areas subject to the collection of contaminants or spills shall be fitted with adequate oil / grit separators.
- Maintenance access requirements are to be determined on a site-by-site basis; however, the following general criteria are recommended: Controlled maintenance access routes shall be provided to both inlet and outlet structures and forebays. A minimum 6.0 m wide surface to accommodate maintenance vehicles within a minimum 10 m turning radius (inside radius) and a flat 10 m loading areas is required. Maintenance access routes shall not exceed a maximum slope of 10:1.

The design of maintenance routes and loading areas shall be to the approval of the Manager of Development Engineering.

- Sediment drying area may be required adjacent to the forebay area to facilitate dewatering of sediment prior to removal to an approved disposal location.
- Maintenance by-pass shall be provided via a maintenance hole upstream of the entry to the pond to divert **all** flow from the pond during maintenance and sediment removal procedures.
- Graduated poles shall be installed in all wet cells for measuring sediment accumulation and set to design grade.

3.7.6 Storm Sewer Design

Storm sewers, designed and constructed in accordance with the most recent requirements and specifications of the Township, shall be of adequate size and depth to provide service for the development of lands within the upstream watershed and/or for the drainage of any areas designated by the Township. Storm drainage shall be directed to an outlet considered adequate in the opinion of the Township and applicable agencies.

Channel works, bridges, culverts and **all** other drainage structures or works shall be designed, approved, and constructed in accordance with the most recent drawings and specifications of **all** applicable agencies having jurisdiction, such as the Township, LSRCA, NVCA, MECP, MTO, MNRF, DFO, etc.

3.7.6.1 Hydrology and Design Flows

Storm sewers shall be designed to drain **all** lands based on the Rational Method. The Rational Method calculations shall be checked using a model approved by the Township where the drainage area is greater than 10 hectares. The larger of the flows is to be used in the design of the sewer system unless approved otherwise.

Q = 0.0028 C I A where: Q = Flow in cubic metres per second
A = Area in Hectares
C = Run-off coefficient
I = Intensity in mm/hr

Storm sewers shall generally be designed to accommodate 1 : 5-year storm flows.

3.7.6.2 Intensity of Rainfall

The intensity of rainfall is to be determined from the MTO - **ONTARIO I D F Look-Up**

http://www.mto.gov.on.ca/IDF_Curves/map_acquisition.shtml

Intensity Calculation:

Where $\mathbf{I = A \times t^B}$

I is in mm/hr, **t** is time of concentration in hours; **A** and **B** are as follows:

Storm Return Period	A	B
2 year	22.5	-0.728
5 year	29.9	-0.725
10 year	34.8	-0.724
25 year	40.9	-0.723
50 year	45.5	-0.722
100 year	50.0	-0.722

3.7.6.3 Time of Concentration

The minimum initial time of concentration is to be 10 minutes.

Pre-Development Areas:

To calculate the initial time of concentration (**tc**) for upstream, undeveloped lands, the following formulas may be used: Bransby-Williams or Airport Method. The most appropriate method shall be determined at the discretion of the Township.

3.7.6.4 Run-off Coefficient

The Developer's Consulting Engineer shall submit calculations and drawings (as required) to support the run-off coefficients used for storm sewer design with the Rational Method.

In general, run-off coefficients shall be as follows:

Parks over 4 hectares	0.20*
Parks 4 hectares and under	0.25*

* Parks with increased impermeable area shall require a higher run-off coefficient.

Single-family Residential (Urban)	0.45
Single-family Residential (Suburban)	0.40
Semi-detached Residential	0.60
Townhouses, Maisonettes, Row Houses, etc.	0.70
Apartments	0.75
Schools and Churches	0.75
Industrial (local)	0.75
Industrial (urban)	0.90
Commercial	0.90
Heavily Developed Areas	0.90
Paved Areas	0.95

A minimum run-off coefficient of 0.55 is to be used for undeveloped upstream area where future residential development is expected and 0.75 where future industrial, high-density residential or commercial development is expected.

3.7.6.5 Drainage Area

Drainage systems shall be designed to accommodate **all** upstream drainage areas considering interim and ultimate conditions.

3.7.7 Pipe Sizing and Specifications

3.7.7.1 Pipe Capacities

Manning's formula shall be used in determining the capacity of **all** storm sewers. The capacity of the sewer shall be determined on the basis of the pipe flowing full.
The value of the roughness coefficient 'n' used in the Manning's formula shall be as follows:

- concrete pipe 0.013
- concrete box culverts 0.013
- corrugated metal 68 x 13mm corrugations 0.024
- corrugated metal 25% paved invert 0.021
- PVC pipe 0.013
- HDPE smooth wall ribbed pipe 0.013

3.7.7.2 Flow Velocities (Flowing full)

For circular pipes the minimum acceptable velocity is 0.8 m/s and the maximum acceptable velocity is 3.5 m/s during the 5-year storm event.

3.7.7.3 Minimum Sizes

The minimum size for an on-street storm sewer shall be 300 mm diameter.

3.7.7.4 Minimum Grades

Regardless of flow velocities obtained, the minimum design grades for pipe storm sewers shall be as follows:

Sewer Size (diameter)	Minimum Grade
≤ 375 mm	0.40%
450 mm ≤ 525 mm	0.30%
600 mm ≤ 1200 mm	0.20%
> 1200 mm	0.15%

3.7.7.5 Depth of Storm Sewers

The depth of a deep storm sewer shall be sufficient to provide a suitable outlet for the building foundation weeping tiles. The minimum cover to the top outside pipe barrel of a deep storm sewer shall generally be 2.5 to 3.0 metres. The minimum cover to the top outside pipe barrel of a shallow storm sewer system shall not be less than 1.5 metres from the centre-line of the roadway unless alternate measures are implemented as approved by the Township.

3.7.7.6 Location

The storm sewers shall be located as shown on the standard Township road cross-section drawings. This standard location shall be generally 2.1 metres north or east of the centreline of the road allowance. In the case of crescents, looped and curvilinear roads, this standard location may be varied to the extent that the storm sewer remains on the same side of the centreline of the road (i.e., left or right) to avoid crossing the sanitary sewer trenches at the changes in direction of the road.

3.7.7.7 Pipe Crossings

A minimum clearance of 0.20 metres shall be provided between the outside of **all** pipe barrels at **all** points of crossing. In cases where the storm sewer crosses a recent utility trench at an elevation higher than the elevation of the utility, a support system shall be designed to prevent settlements of the storm sewer, or alternatively the original trench shall be re-excavated to the top of the utility and shall be backfilled with non-shrinkable fill (low strength concrete) to adequately support the storm sewer. When the storm sewer passes under an existing utility, adequate support shall be provided for the utility during and after construction to prevent damage to that utility.

3.7.7.8 Radius Pipes

Radius pipe shall be allowed for storm sewers 1050 mm in diameter and larger provided that a maintenance hole is located at the beginning or at the end of the radial section. The minimum centre line radius allowable shall be in accordance with the minimum radii table as provided by the pipe manufacturer.

3.7.7.9 Limits of Construction

Sewers shall be terminated with a maintenance hole at the upstream subdivision limits when external drainage areas are considered in the design. The design of the terminal maintenance holes shall allow for the future extension of the sewer.

When external areas are not included in the sewer design, the sewer shall extend at least halfway across the frontage and/or flankage of any lot or block in the subdivision.

3.7.7.10 Sewer Alignment

Storm sewers shall be laid in a straight line between maintenance holes unless radius pipe has been designed. Joint burial (common trenching) with sanitary sewers **may** be considered when supported by the recommendations of a soils report prepared by the Developer's Geotechnical Engineering Consultant.

3.7.7.11 Changes in Pipe Size

No decrease of pipe size from a larger size upstream to a smaller size downstream shall be allowed regardless of the increase in grade.

3.7.7.12 Pipe Material Classification and Bedding

All storm sewer mains shall generally be constructed of reinforced concrete with suitable strength class recommended by the Developer's Consulting Engineer. Smooth wall ribbed PVC may be used for mains up to 900 mm diameter. Storm sewer leads from catch basins shall be constructed with non-reinforced concrete pipe or PVC pipe.

The class of pipe and the type of bedding shall be selected to suit loading and proposed construction conditions. For rigid pipe, Class B bedding (compacted Granular A bedding and cover over the sewer) in accordance with OPSD shall be used.

Embedment for flexible pipe shall be Granular A in accordance with OPSD.

Alternate granular materials for pipe bedding may be specified, subject to the approval of the Township, however clear stone bedding is generally not permitted. In areas where it is difficult to control the infiltration of ground water into the sewer trenches clear stone bedding may be considered provided it is completely wrapped in a suitable geotextile, selected, and installed in accordance with the manufacturer's requirement.

The width of trench at the top of the pipe shall be carefully controlled to ensure that the maximum trench width is not exceeded unless additional bedding or higher strength pipe is used. Where poor soil conditions and high ground water levels are present, the Consulting Engineer shall prepare special designs for the Township's approval.

- Reinforced concrete pipe shall conform to the requirements of OPSS 1820.
- Polyvinyl chloride (PVC) pipe products shall conform to the requirements of OPSS 1841. The pipe shall be manufactured with factory assembled spigot gasket and integral bell joints.
- Polyethylene pipe products shall conform to the requirements of OPSS 1840.

3.7.8 Maintenance Hole Requirements

Maintenance holes shall be precast concrete and shall be designed and constructed in accordance with the most recent OPSS and OPSD. Where the standard drawings are not applicable, the maintenance holes shall be individually designed and detailed.

3.7.8.1 Location and Spacing

Maintenance holes shall be located at each change in alignment, grade, or pipe material, at **all** pipe junctions, at the beginning or end of **all** radius pipe sections, and at intervals along the pipe to permit entry for maintenance to the sewer.

3.7.8.2 Maximum Spacing

The maximum spacing between maintenance holes shall be as follows:

Pipe Size (diameter)	Maximum Maintenance Hole Spacing (m)
≤ 600 mm	100 m.
675 mm ≤ 1200 mm	120 m.
> 1200 mm	150 m.

3.7.8.3 Maintenance Hole Design

- Minimum size of maintenance holes to be 1500 mm diameter from the base to 1.80m in height (min.) at which point a taper transition to 1.20m can be made.
- **All** maintenance hole chamber openings shall be located on the side of the maintenance hole parallel to the flow for a straight run maintenance hole, or on the upstream side of the maintenance hole at **all** junctions.
- The change in direction of flow in any maintenance hole shall not be permitted at acute interior angles.
- Safety gratings shall be provided in **all** maintenance holes when the depth of the maintenance hole exceeds 5.0 m. The maximum spacing between safety gratings shall not exceed 5.0 m.
- The obvert(s) on the upstream side of a maintenance hole shall not be lower than the obvert of the outlet pipe.
- The maximum change in direction of flow in maintenance hole, for sewer sizes 1050 mm diameter and over, shall be 45°.
- Where the difference in elevation between the obvert of the inlet and outlet pipes exceeds 0.6 m, a drop structure shall be placed on the inlet pipe.
- **All** storm sewer maintenance holes shall be benched to the obvert of the outlet pipe for pipe sizes 600 mm or less and to the spring line of the outlet pipe for pipe sizes 675 mm and greater.

- The minimum width of benching in **all** maintenance holes shall be 230 mm.
- **All** maintenance holes and catch basin structures shall have frost straps in accordance with OPSD 701.100.
- Maintenance holes in boulevards shall be located, wherever possible, a minimum of 1.5 m from the face of curb or other service.
- Minimum size of any maintenance hole stack shall be 685 mm square.

3.7.8.4 Elevations for Maintenance Hole Frames and Covers

All maintenance holes, located within the travelled portion of a roadway, shall have the rim elevation set flush with the surface of the base course asphalt. The concreting and setting of the frame and cover shall be completed in accordance with the details provided in the standard drawing.

- Modular Maintenance Hole Lift Rings shall be IPEX Lifesaver HDPE type or equivalent.
- A maximum of 300 mm of modular lift rings shall be permitted on maintenance holes in new subdivisions.
- Prior to the placement of the final lift of asphalt, maintenance hole frames shall be reset to final elevations.

3.7.8.5 Head Losses and Drops

Suitable drops shall be provided across **all** maintenance holes to compensate for the loss in energy due to the change in flow velocity and for the difference in the depth of flow in the sewers.

In order to reduce the amount of drop required, the designer shall, wherever possible, restrict the change in velocity between the inlet and outlet pipes to 0.6 metres/sec. Hydraulic calculations shall be submitted for **all** junction and transition maintenance holes on sewers where the outlet is 1,050 mm or greater.
In addition, hydraulic calculations may be required for maintenance holes where the outlet pipe is less than 1,050 mm dia. if, in the opinion of the Township, there is insufficient invert drop provided across the maintenance hole.

Regardless of the invert drop across a maintenance hole as required by calculation, the obvert of the outlet pipe shall not be higher than the obvert of the inlet pipe in any maintenance hole.

The minimum drops across maintenance holes shall be as follows:

Change in Direction	Minimum Drop (mm)
Straight run	30
≤ 45°	50
> 45° ≤ 90°	80

3.7.8.6 Frame and Grate

All maintenance hole frames shall be as per OPSD 401.010 with Type A closed cover labeled **Storm**.

3.7.9 Catch Basin Requirements

3.7.9.1 Location and Spacing

Catch basins shall be selected, located, and spaced in accordance with the conditions of design. The design of the catch basin location and type shall take into consideration the lot areas, the lot grades, pavement widths, road grades and intersection locations.

All catch basins and their leads shall be of the single or double type. To ensure that the capture or inlet capacity matches that of the storm sewer, the spacing of catch basins on roads may be varied.

If detailed analysis of the major-minor system and SWM analysis of the pipe system indicate the need for inlet controls, additional constrictions shall be implemented. Since reduction in the size of the standard catch basin covers is not desirable, an orifice plate can be located in the catch basin. This is applicable to private development **only**. Orifice plates **are not** permitted within the Township right-of-way.

Catch basins shall be generally located upstream of sidewalk crossings at intersections and upstream of **all** pedestrian crossings.

Catch basins shall not be located in driveway curb depressions.

Double catch basins shall be required when the catch basin intercepts flow from more than one direction.

Rear yard catch basins shall be eliminated whenever possible.

Maximum spacing for catch basins including cul-de-sac gutters shall be as follows:

Pavement Width (m)	Maximum Spacing (m)	
	≤ 4% Grade	> 4% Grade
≤ 8.5	90	60
> 8.5 ≤ 9.8	80	55
> 9.8 ≤ 12.2	75	50
> 12.2	60	40

3.7.9.2 Catch Basin Types

Catch basins shall be pre-cast concrete and shall be designed and constructed in accordance with the most recent OPSS and OPSD.

Special catch basins and inlet structures shall be fully designed and detailed by the Developer's Consulting Engineer.

Double catch basins are to be installed at the low point of any road.

3.7.9.3 Catch Basin Leads

- For single catch basins, the minimum size of connection shall be 300 mm diameter and the minimum grade shall be 1.0%.
- For double catch basins, the minimum size of connection shall be 375 mm diameter and the minimum grade shall be 1.0%.
- For rear lot catch basins, the minimum size of the connection shall be 300 mm diameter and the minimum grade shall be 1.0%.

In general, catch basins located in close proximity to a maintenance hole shall have their leads connected to the maintenance hole.

Catch basin leads may not exceed 30.0 m when connected to the maintenance hole or sewer. Alternatively, a longer lead can be connected to the sewer and a 1500 mm

diameter maintenance hole / catch basin used in lieu of the normal 600 mm. square catch basin.

3.7.9.4 Frame and Grate

The frame and cover for catch basins in roadway or walkway areas shall be as detailed in OPSD 400.030. In specific instances, where stormwater management conditions, due to road grade and surface flows, OPSD 400.100 ***may*** be determined to be detailed.

Catch basins located in grassed areas shall have a Birdcage Grate per OPSD 400.120.

3.7.9.5 Catch Basins at Intersections

All catch basins at road intersections shall be located on the tangent section of the curb at a minimum of 0.6 metres distant from the beginning or the end of the radial portion of the curb.

3.7.9.6 Elevations for Catch Basin Frames and Grates

All catch basins located within the travelled portion of a roadway, shall have the frame elevation set flush with the surface of the base course asphalt.

The adjusting and setting of the frames and grates shall be completed in accordance with the details provided in OPSD 704.010 upon placement of surface course asphalt. Temporary asphalt curbing shall be placed in accordance with OPSD 601.010 - Type “D”, between the two adjacent expansion joints.

Prior to placing surface course asphalt, temporary asphalt curbs shall be removed and replaced by concrete curb.

Catchbasin Lift Rings shall be IPEX Lifesaver HDPE type or equivalent.

3.7.10 Downspouts, Foundation Drains and Sump Pumps

3.7.10.1 Downspouts

- Downspouts on **all** single family, semi-detached and townhouse residential units shall be discharged onto grassed or garden areas and away from wells or tile bed areas.

- Downspouts shall not encroach over / onto other adjacent private lands.
- Downspouts shall discharge onto splash pads of a hardened impervious material and **shall not** discharge onto driveways, walkways or over top of septic holding tanks.
- Downspouts from **all** commercial, industrial, institutional, and high-density residential buildings shall be discharged onto grassed or garden areas, if possible and if acceptable to the Township.

3.7.10.2 Foundation Drains

The Township requires that a sump pump system be installed in every building.
In every case, the underside of footing shall be set above the seasonal high ground water level, as determined in the geotechnical report.

3.7.10.3 Sump Pumps

Where sump pumps are installed in residential developments with open ditches:

- sump pump discharges **shall not** be placed within the Township's ditch lines of the road allowances.
- Sump pump discharge pipelines **shall not** be connected to a storm sewer system.
- Sump pump discharges shall be directed to rear or side yard drainage swales and **shall not** discharge onto driveways, walkways or over top of septic holding tanks.

3.7.11 Channel, Culvert, and Overland Flow

For channel, culvert, bridge and/or erosion control projects the proponent is responsible for obtaining **all** necessary approvals from the governing agencies, such as the NVCA, LSRCA, MNRF, DFO and/or MECP.

3.7.12 Culverts and Bridges

3.7.12.1 Culvert and Bridge Hydraulic Capacity

Only arterial and collector roads should, if feasible, be permitted to cross the major system watercourses. It is also recommended that designers consider the need to

design culverts and bridges on such arterial and collector roads for at least the 1:100-year storm flow, if not for the Regional Storm flow. If smaller culverts or bridges are provided, the backwater effects for the 1:100 year and Regional Storm flows shall be determined. Concrete box culverts shall be designed and placed for **all** watercourse crossings subject to the approval of the Township. MNRF, DFO, NVCA and/or LSRCA approval may be required for watercourse/valley crossings under their regulations.

Road Classification	Design Flood Frequency
Arterial	1:100 Year to Regional
Collector	1:50 Year
Urban Local	1:25 Year
Rural Local	1:25 Year
Temporary Detour	1:10 Year
Driveway	1:5 Year

NOTE: All culverts shall be of sufficient length to provide for a preferred 5:1 (maximum 3:1) slope off the driving surface to the ditch invert.

Bridges and other major drainage structures shall require special designs as determined by the Township. Hydraulic calculations shall be required.

The frequency and magnitude of flooding or erosion shall not be increased on upstream or downstream properties.

All Driveway Entrance Culverts shall be Ultra Rib - Smooth Wall plastic pipe.

The **minimum length** of each driveway culvert shall be 7.0 m and the minimum diameter shall be a **minimum of 450 mm in diameter** or larger according to the Stormwater Management requirements.

Driveway culverts are to be minimum 3.0 m from hydro poles and utility boxes.

3.7.12.2 Open Channels

The proposed criteria for an open channel design shall be submitted to the Township for approval prior to the actual design being undertaken. Open channels shall be defined

as major system overland flow channels, minor system outfall channels or natural channels. Major system overland flow channel designs may be required to accommodate the Regional Storm or the 100-year storm for new development.

The Developer's Consulting Engineer shall also be responsible for obtaining the approval of the design from the MNRF, DFO, NVCA, LSRCA and the MECP, if the open channel concept is favourably considered.

Natural Channel design criteria shall be determined on a site by site basis.
The following guidelines shall be considered:

Open Channels	Minimum	Maximum
Grass lined – Natural	0.7 m/s	1.5 m/s
Grass lined – Maintained	0.7 m/s	1.5 m/s
Gabion lined	0.7 m/s	2.5 m/s
Concrete lined	0.7 m/s	4.0 m/s

3.7.12.3 Watercourse Erosion and Bank Instability

Where erosion or bank instability is already evident in an area to be developed or re-developed, the Township requires that the situation be stabilized by appropriate remedial measures.

Where development **may** potentially cause significantly increased downstream erosion, the Township shall require the Developer to mitigate further damage by appropriate remedial and preventative measures.

Where designing remedial erosion or bank stabilization works, preservation of the watercourse dynamics and natural valley aesthetics shall be secondary only to achieving a sound technical solution. The proposed design shall reference the MNRF Natural Channel Design Manual.

A normal bank flow channel has a capacity of about the 1:2-year flood. Protection to this level shall be adequate provided care is taken to prevent any damage by higher floods and provided that the channel bank is not coincident with a higher valley bank. In

this latter case, it may be necessary to protect the bank to a level as high as the 1:100-year flood or even the flood resulting from the Regional Storm.

The proposed criteria for an erosion or bank stability design shall be submitted to the Conservation Authority and / or Township for approval prior to the actual design being undertaken.

3.7.12.4 Floodline Calculations

All floodline calculations shall be performed by a recognized engineering method and are to conform to the Ministry of Northern Development, Mines, Natural Resources and Forestry Flood Plain Management in Ontario Technical Guidelines in consultation with the Township.

An acceptable method would include the HEC 2 computer model.
All supporting documentation is to be included in the submission including a hard copy of the computer printout and a digital copy containing all input and output files.

3.7.12.5 Overland Flow Routes

An overland flow route continuous to the nearest major channel shall be established through **all** areas and shall be contained within either the road right-of-way or by easements.
If the overland flow route travels across downstream property not municipally owned, the developer shall obtain the necessary agreement(s) from downstream owner(s) accepting the increased quantity of runoff.

The depths of flooding permitted on roads and at intersections during the 1:100-year storm are as follows:

- no building shall be inundated at the ground line, unless the building has been flood proofed
- for **all** classes of roads, the depth of water at the gutter shall not exceed 0.3 m.

Flow across road intersections shall not be permitted for minor storms (generally 1:10 year). To meet the criteria for major storm run-off, low points in roads shall have adequate provision for safe overland flow.

3.7.13 Inlet / Outlet and Special Structures

Inlet and outlet structures shall be fully designed on the engineering drawings. The details provided shall include the existing topography, proposed grading, and the work necessary to protect against erosion.

3.7.13.1 Inlets

Inlet structures shall be fully designed by the Developer's Consulting Engineer, should OPSD structures not be deemed to be suitable. Inlet grates shall generally consist of inclined parallel bars or rods set in a plane at approximately 180 degrees with the top away from the direction of flow. Gabion, riprap, or concrete shall be provided at **all** inlets to protect against erosion and to channel the flow to the inlet structure.

Hydraulic design calculations for inlet structures shall be performed in accordance with guidelines established by the Ministry of Transportation Drainage Manual.
The design of any culvert on a new or reconstructed watercourse where an inlet grating is required shall provide a measure of safety and minimize the risk of entanglement or entrapment of a person. As well, grating shall be designed to prevent debris from entering the stormwater system.

3.7.13.2 Outlets

The OPSD headwall standards shall be used for **all** storm sewers up to 2,400 mm diameter. For sewers over 2,400 mm the headwalls shall be individually designed.

- **All** headwalls shall be equipped with a grating over the outlet end of the pipe and a railing across the top of the headwall for the protection of the public.
- Outfall grates shall consist of horizontal bars or rods spacing shall not exceed 150mm clear. **All** metal parts from inlet/outlet grates to be protected from rusting.
- **All** outlets shall blend in the direction of flow of the watercourse with the directional change being taken up in the sewer rather than the channel.

- Storm sewer outfalls shall not be connected to existing or proposed road crossing culverts.
- Storm sewer outfalls shall be terminated at separate headwall structures, adjacent to the outlet side of road crossing culverts.
- Gabions, Terra-fix blocks, riprap, concrete or other erosion protection shall be provided at **all** outlets to prevent erosion of the watercourse and the area adjacent to the headwall.
- The extent of the erosion protection shall be indicated on the engineering drawings and shall be dependent upon the velocity of the flow in the storm sewer outlet, the soil conditions, the flow in the existing watercourse and site conditions.

3.7.14 Storm Sewers – As-Constructed Drawings

All actual storm system invert elevations shall be indicated on the As-Constructed drawings. If the difference is greater than 150 mm from the design vertical alignment, affected portions of the sewer or overland drainage route shall be redrawn in profile. Any maintenance hole which differs from the proposed horizontal location by more than 1.50 m shall be redrawn in both plan and profile.

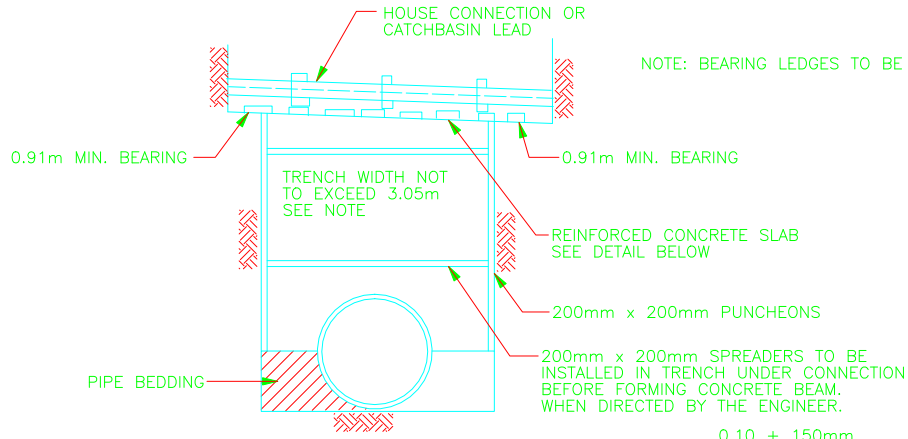
In addition, the following shall be indicated on the As-Constructed drawings:

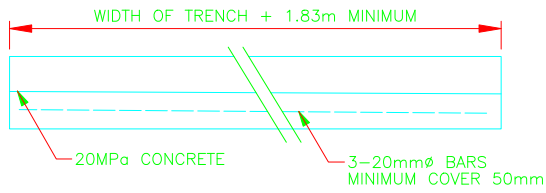
- pipe/culvert size, grade, type, class;
- chainage from MH along main to service tees.

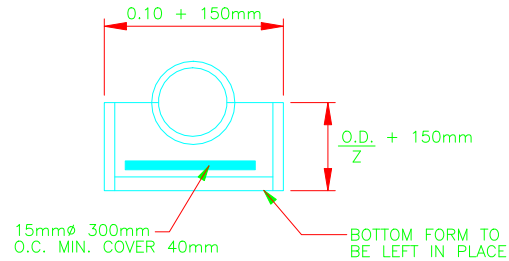
NOTE: If As-Constructed grade of sewer differs by more than 1% of the design grade, the Developer's Consulting Engineer shall submit revised hydraulic calculations.

3.7.15 Testing and Acceptance

A CCTV inspection (including flushing) as per OPSS 409 shall be conducted upon satisfactory completion of **all** other testing, prior to the Township's recommendation for issuance of Substantial Completion and Maintenance and prior to the placement of the final (surface) course of asphalt. A CCTV inspection (including flushing) shall also be required prior to the issuance of Final Acceptance and Assumption if 18 months have lapsed since the placement of surface course asphalt.

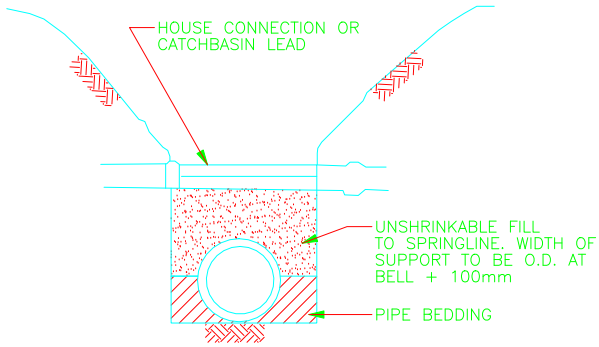


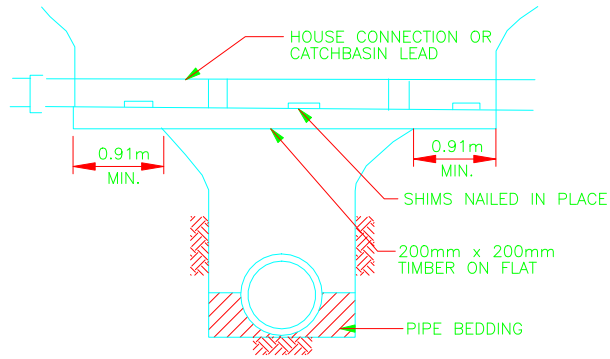




REINFORCED CONCRETE SUPPORT FOR HOUSE CONNECTIONS AND CATCHBASIN LEADS WHEN WIDTH OF TRENCH EXCEEDS 1.52m BUT LESS THAN 3.05m

NOTE: WHEN WIDTH OF TRENCH EXCEEDS 3.05m METHOD OF SUPPORTING HOUSE CONNECTIONS AND CATCHBASIN LEADS WILL BE AS DIRECTED BY THE ENGINEER.





SUPPORT FOR CONNECTION CROSSING TRENCH WHEN WIDTH OF TRENCH IS LESS THAN 1.52m

NOTES:

1 .WHERE HOUSE CONNECTIONS OR CATCHBASIN LEADS CROSS A SEWER TRENCH, THEY WILL BE SUPPORTED ON A NEW 20mm x 200mm TIMBER WHICH HAS A MINIMUM BEARING OF 0.91M AT EACH END ON UNDISTURBED GROUND. CONNECTION MUST BE PROPERLY SHIMMED OR BEDDED ON 20MPa CONCRETE FILL TO SPRINGLINE AS PER DETAILS.

2. TO BE USED WHEN INSTALLING SEWER OR WATERMAIN ON EXISTING R.O.W.
3. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS.
4. FOR ALL CROSSING OF GAS MAINS, CONTRACTOR TO CONTACT GAS COMPANY FOR LOCATES AND INSPECTIONS.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

SUPPORTS FOR HOUSE CONNECTIONS AND CATCH BASIN LEADS

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.7-01

STORM SEWERS

A) M.H., CBMH AND DICBMH TO OPSD – 701.XXX (AS APPROPRIATE) C/W SUMP UNLESS NOTED OTHERWISE.

B) STEPS TO OPSD 405.010.

C) M.H. FRAMES AND GRATES TO OPSD–401.01 OPEN COVER.

D) C.B.'S TO OPSD – 705.010, 705.020

E) DICB'S TO OPSD – 705.030, 705.040, 706.010, 706.020, 706.030, 706.040

F) C.B. AND CBMH FRAMES AND GRATES TO OPSD – 400.020 OR IN SPECIFIC CIRCUMSTANCES 400.100 AND REAR LOT 400.120.

G) PIPE SUPPORT AT M.H.'S, CB'S AND CBMH'S TO OPSD – 708.020.

H) C.B. LEADS – 300mm DIA SINGLE AND 375mm DIA DOUBLE TO OPSD – 708.010, 708.030.

I) PROTECTION DURING CONSTRUCTION TO OPSD – 808.010.

J) BEDDING AND COVER TO OPSD – 802.010. (FLEXIBLE PIPE) GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL OR OPSD – 802.030, 802.031 AND 802.032 (RIGID PIPE) GRANULAR 'A' BEDDING AND GRANULAR 'B' (MAXIMUM AGGREGATE SIZE 25mm) COVER.

K) TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.

L) BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

NOTES – STORM SEWERS

APR'D:

DRAWN:

DATE: 03 / 2016

SCALE: NTS

STD. No. 3.7–02

3.8 Water Supply Distribution

Watermain shall be designed and constructed in accordance with the most recent requirements and specifications of the Township, MECP, and AWWA.
Watermain shall be of adequate size to provide service for the development of adjacent lands designated by the Township.

Prior to the commencement of any design for new watermain within the Township, the applicant shall obtain confirmation from the drinking water system owner that adequate water supply exists for the development proposed.

3.8.1 Watermain Design Criteria

All watermain shall be sized to meet the **greater of**: the maximum daily demand plus fire flow **or** the peak hourly demand and fire flow.

3.8.1.1 Watermain Pressure

The maximum sustained operating pressure shall not exceed 700 kPa (100.0 psi).

If localized area pressure exceeds this level, a pressure-reducing valve shall be installed on each service connection within that area or as a design consideration to be included within the main.

Under normal conditions of maximum day demand, the pressure shall not drop below 345 kPa (50 psi) at any point in the water system.

A design consideration shall be required to increase (boost) pressure when 345 kpa (50 psi) cannot be maintained throughout the distribution system

Under conditions of **simultaneous maximum day and fire flow demands**, the pressure shall not drop below 140 kPa (20 psi) at any point in the water system.

3.8.1.2 Friction Factors

The following “C’ values shall be used in the Hazen-Williams equation, for the design of water distribution systems regardless of pipe materials.

Pipe Diameter (mm)	C-Factor
150	100
200 to 300	110
400 to 600	120
Over 600	130

The above C-factors represent long-term values. A C-factor of 140 shall be used to calculate maximum velocities for transient pressure estimations, or for checking pump motor sizes for runout conditions.

In evaluating existing systems for expansion, the C-factors shall be determined by actual field tests, wherever possible.

The Hazen-Williams equation shall be used to calculate the flow in watermain as follows: $Q = 0.84918\ (C)\ (A)\ (R)^{0.63}\ (S)^{0.54}$

Where: Q = Discharge (m^3/sec.)

C = Coefficient of Roughness

A = Cross-Sectional Flow Area (m^2)

R = Hydraulic Radius (m)

S = Slope of Energy Grade Line (m/m)

3.8.1.3 Domestic Demand

Domestic water demand shall be calculated on the basis of an average day consumption rate of 450 litres per capita per day and utilize County and Township approved densities based on development charges studies as updated.

The maximum day and peak hour factors shall be determined from the latest MECP design guidelines although the following are considered minimums:

Maximum daily demand factor: 2.0

Peak hourly demand factor: 4.5

Peak flows other than domestic flows shall be determined on an individual basis.

3.8.1.4 Commercial and Institutional Water Demands

An average day flow of 28 cu.m. per hectare per day shall be used for design purposes to estimate the water consumption for large commercial areas unless more specific data is available.

When specific planning information is available, water consumption for individual commercial and institutional sites may be calculated from the following table:

Use	Water Usage
Shopping Centers	2500 - 5000L/1000 m^2/day
Hospitals	900 -1800 L/bed/day
Schools	70 - 140 L/student/day
Campgrounds	225 - 570 L/campsite/day

The peak water usage rates in campgrounds varies with the type of facilities provided (showers, flush toilets, clothes washers, etc.) and the ratio of these facilities to the number of campsites. A peak rate factor of 4 shall be used. This factor shall be applied to the average expected water usage at full occupancy of the campsite.

3.8.1.5 Industrial Water Demands

An average design flow of 36 cu.m. per hectare per day shall be utilized for design purposes to estimate the average consumption rate for industrial areas unless more specific data is available.

3.8.1.6 Fire Flows

The requirements for fire flows shall be discussed and agreed upon with the Director of Environmental Services and the Chief of Fire and Emergency Services prior to proceeding with detailed design.

The Water Supply Distribution system shall be designed and constructed to meet the requirements of NFPA 24.

3.8.2 Selection of Watermain Sizing

All I.C.I. and Multi-Residential watermain to have a minimum water service size of 150 mm diameter and **to be sized according to the anticipated water demand.**

For **all** watermain designed to carry fire flows, the following minimum sizing for watermain shall apply: For Residential areas - 150 mm diameter
For Commercial areas - 200 mm diameter
For Industrial areas * - 300 mm diameter minimum

In general, the following standardized watermain sizes shall be used in the Township: 150 mm, 200 mm, 300 mm, 400 mm, 500 mm, 600 mm

3.8.3 Depth of Watermain

Curb and Gutter Roads	-	1.7 m minimum to obvert, measured below finished centre line road grade.
Open Ditch Roads	-	The cover over the watermain and the service connections shall not be less than 1.7 metres.
Unimproved Roads	-	1.7 m minimum to obvert, measured below a future design centre line road grade.
Watercourses, Creek	-	Adequate frost protection shall be provided below stream bed. Generally, 1.7 m minimum to obvert, measured below the watercourse invert shall be considered acceptable.

3.8.4 Location of Watermain

Watermain shall be located as shown on the standard Township road cross-section. This location shall generally be on the north or west sides of the road.

3.8.4.1 Horizontal Separation of Watermain and Sewers

Under normal conditions watermain shall be designed with a minimum clear horizontal separation of at least 2.5 m from any sewer or sewer maintenance hole. The distance shall be measured from the nearest edges of the pipes or structures.

3.8.4.2 Separations of Watermain and Sewers – Special Conditions

Under unusual conditions (where a significant portion of the construction shall be in rock, or where congestion with other utilities shall prevent a clear horizontal separation of 3.0 m) a watermain may be laid closer to a sewer, provided the elevation of the crown of the sewer is a least 0.5 m below the invert of the watermain. Such separation shall consist of in-situ material or compacted native earth backfill.

In rock trenches, facilities shall be provided to permit drainage of the trench to minimize the effect of the impounding of surface water and/or leakage from sewers in the trench.

3.8.4.3 Watermain Crossing Sewers

Under normal condition watermain shall cross above sewers with at least 0.5 m vertical separation.

When it is not possible for the watermain to cross above the sewer main, the watermain passing under a sewer shall be protected as follows:

- A vertical separation of at least 0.50 m shall be provided between the outside face of the sewer and the top of the watermain.
- The sewer shall be adequately supported to prevent excessive deflection of joints and settling.
- The length of watermain pipe under the sewer shall be centered at the point of crossing so that the joints shall be equidistant and as far as possible from the sewer. Watermain pipe joints shall be located 1.5 metres (minimum) from the centreline of the sewer (both sides).

3.8.4.4 Utility Crossings

Watermain crossing over or under other utilities shall be designed with a 300 mm minimum clear separation between the outside edges of the watermain and the utility.

3.8.4.5 Dead-Ends

Water distribution systems shall be designed in grid patterns or looped to avoid dead-end sections.

Minimum pipe size and material for loops shall be 150 mm diameter PVC or designed in accordance with a specific location at the discretion of the Township.

3.8.4.6 Extra Mains and Extra Fittings

No roadway leading out of a subdivision shall be completed and accepted by the Township until connecting watermain are installed complete to the subdivision limits. Extra fittings shall be installed at any point on the watermain requested by the Township to provide for future connections.

3.8.5 Pipe Classification and Bedding

Acceptable materials for watermain pipe up to and including 300 mm diameter are as follows:

- Polyvinyl Chloride Pipe (PVC) manufactured in accordance with the latest edition of CSA B137.3. A minimum Class 150, DR 18 pipe shall be used.
- Fittings shall be of cast iron or ductile iron; cement lined, manufactured to AWWA C110. **All** fittings shall be supplied with mechanical joint ends.
- Polyethylene pressure pipe shall be to OPSS 1842.
- 25 mm dia. residential services shall be polyethylene pipe.

The class of pipe and the type of bedding shall be selected to suit loading and proposed construction conditions. Pipe bedding and cover shall be homogeneous granular materials in accordance with OPSD requirements for flexible pipe.

The width of trench at the top of the pipe shall be carefully controlled to ensure that the maximum trench width is not exceeded unless additional bedding or higher strength pipe is used.

Where poor soil conditions and high ground water levels are present, the Developer's Consulting Engineer shall prepare special designs for the Township's approval.

3.8.6 Thrust Restraint

Adequate restraint shall be provided at **all** fittings and deflections in the water distribution system to prevent pipe movement and subsequent joint failure.

The Developer's Consulting Engineer shall provide thrust restraint calculations on the drawings.

Mechanically restrained joints shall be used for **all** PVC watermain, including dead-end valves. The recommended type of restraint in the design shall depend on anticipated soil conditions. Concrete thrust blocks shall **only** be permitted with restraints to support hydrants.

3.8.7 Corrosion Resistance

Denso Paste-Petrolatum Tape Primer or equivalent shall be installed on every valve, hydrant and fitting connected to a non-ferrous watermain.

Fittings shall include bends, tees, crosses, sleeves, reducers, plugs, caps, joint restrainers, and couplings etc.

3.8.8 Tracer Wires and J Clips

A tracer wire shall be provided along the top of **all** Polyvinyl Chloride (PVC) watermain to permit future field tracing.

- Tracer wires shall be attached to the top of the watermain and secured with J Clips and shall be looped up and outside each valve box and drilled in at the top, including hydrant valves and shall also be connected to the bottom flange of **all** hydrants.
- Tracer wires shall be No. 12 gauge stranded copper (TWH) complete with plastic coating.

3.8.9 Fire Hydrants

- **All** fire protection design requirements shall be reviewed with the Director of Environmental Services and the Chief of Fire and Emergency Services at the preliminary design stage.
- Fire hydrants shall be AVK, McAvity or C.V. Mueller open left with 2 CSA hose ports, one 33 B pumper port and a breakaway type 6" MJ base.

- The hydrant lead shall be minimum 150 mm ductile, Class 52 with a resilient seated gate valve shut off (“Open Left” by Clow or Meuller) placed right after teeing off main.
- The hydrants shall have **all** drain holes plugged and be installed as per OPSD 1105.010.

3.8.9.1 Branch Valves and Boxes

- **All** hydrants installed on watermain up to and including 300 mm diameter shall be installed with a 150 mm diameter branch valve attached to the watermain with an anchor tee.
- **All** hydrants installed on watermain greater than 300 mm in diameter shall be controlled by a 150 mm diameter, branch valve directly secured to the supply main with flanged fittings or restraining tie-rods.

3.8.9.2 Hydrant Spacing

Hydrants shall be installed on **all** watermain 150 mm in diameter and larger with the following maximum allowable spacing:

- 150 m in residential areas, or to provide for a maximum hose length or 75 m.
- 90 m in industrial and commercial areas.

3.8.9.3 Location of Hydrants

Wherever possible, hydrants shall be located at corners, 4.0 m back from the streetline intersections at the edge of daylighting.

All hydrants shall normally be for a 2.0 m depth of trench with provisions for extension at the surface for adjustment to proposed streetline grades.

Hydrants shall be bedded in 19 mm screened crushed stone and braced with poured concrete to the satisfaction of the Township.

Hydrants shall be located 1.20 m minimum distance from the edge of any driveway or house service connection.

A hydrant shall be placed at the end of every cul-de-sac and dead-end road as well as at the high points in roads.

A 3.0-metre-wide platform area shall be constructed in the ditches fronting each fire hydrant. The minimum culvert length shall be 7.0m metres and minimum diameter shall be Ultra Rib smooth wall plastic culvert 450 mm in diameter or sized according to the Stormwater Management requirements.

3.8.9.4 Hydrant Ports

In **all locations** hydrants shall be equipped with 114 mm dia. Pumper Ports and 2 - 64 mm dia. side ports.

3.8.9.5 Direction of Opening

- **All** hydrants shall be equipped with a non-rising stem and shall open in a counter clockwise direction.

3.8.9.6 Colour of Hydrants

All hydrants shall be factory painted as specified on the standard detail drawings.
The hydrant body and caps shall be painted reflectorized yellow.

Private hydrants shall be painted red.

3.8.9.7 Hydrant Markers

Each hydrant is to be provided with a standard marker for easy identification in the winter.

3.8.9.8 Hydrant Appurtenances

One hydrant wrench, valve key and seal kit shall be provided per subdivision development.

3.8.10 Valves

3.8.10.1 Type

Gate valves shall be used on **all** watermain.

- Gate valves shall be an AVK, Mueller or Clow resilient wedge type with sliding type valve box or approved equal. **All** valves shall be of the approved type with non-rising stem and a 50mm square operating nut opening counter clockwise.
- **All** valves on 200mm dia. watermain or smaller shall have mechanical joint ends.
- **All** valves larger than 300mm dia. shall be installed inside chambers and shall have flanged ends. A flange to plain end spacer and a Victaulic coupling shall be installed inside the chamber to permit removal of the valve if necessary.
- **All** valves to be wrapped in Denso Paste – Petrolatum Tape Primer.

3.8.10.2 Size

All line valves shall be the same size as the watermain.

3.8.10.3 Number, Location and Spacing

Generally, three valves are required at a tee intersection and four valves are required at a cross intersection with the valves being located at a point where the streetline projected intersects the watermain.

All valve boxes and valve chambers shall be located in boulevards and out of pavement areas wherever possible.

Where roads extend for greater than normal distances without intersections, the Township may require an extra valve in the main at an intermediate point.

All valves at points of termination of a stage of construction shall be braced with two additional lengths of watermain pipe beyond the gate valve.

Watermain terminations shall be plugged and braced.

Where watermain valves are located under travelled road surfaces, the top of the operating box shall be set flush with the paved surface.

Where the depth of the water valve exceeds 2.0, valve stem extensions shall be specified.

3.8.10.4 Valve Boxes and Chambers

- **All** valves on watermain 300 mm in diameter and smaller shall have valve boxes and specified direct bury operators shall be used.
- **All** valve boxes shall be three-piece, sliding-type, size 'D'.
- **All** valves on watermain 400 mm or larger in diameter shall be installed within concrete chambers set flush with finished grade. The top of the roof slab of valve chambers shall be at least 0.60 m below the profile of the finished pavement.

3.8.10.5 Air Relief Valves

- Air relief valves shall be installed at **all** significant high points of the water distribution system.
- Air relief valves shall be double-acting type, combination air release/vacuum valve.
- Air relief valves shall be housed within a chamber as illustrated in the Standard Detail Drawings and drained to storm sewers where possible. The chambers are to be equipped with "P" traps to prevent movement of gasses.

3.8.10.6 Drain Valves

Drain valves shall be located at the low points of **all** watermain 400 mm in diameter and greater. These valves shall be constructed in a separate chamber.

3.8.11 Service Connections

Individual service connections shall be installed to each unit within the development. Semi-detached lots shall be provided with two separate water service connections.

3.8.11.1 Minimum Sizing

The minimum size of service connection to be provided for a single-family residence located less than 30 metres from the supply main shall be 25 mm in diameter.

For other situations requiring a specific evaluation, the following factors shall be used to determine the minimum size of service connections:

- peak water consumption of the building to be serviced.
- total length of service that shall be required to reach the building.
- elevation of the building with respect to the elevation of the watermain.
- available head in the watermain.
- loss of head in the service connection.
- required head at the point of water usage.

3.8.11.2 Location

Water service connections shall be installed to the mid-point of the frontage of **all** single-family lots as shown on the Standard Drawings.

The location of water service connections for semi-detached lots and freehold townhouses shall be as shown on the Standard Drawings to avoid locating the service under the driveways.

After construction, the end of the connection shall be marked by a suitable length of 50 mm x 100 mm lumber extending from the end of the connection to a point 0.9 m above grade. The top of this marker shall be painted blue.

3.8.11.3 Location of Curb Stop or Control Valve

The curb stops on **all** water service connections 50 mm in diameter and less shall be located at the road limit as shown on the Standard Drawing.

The control valve on water service connections 100 mm in diameter and larger shall be located at the supply main with the valve secured to the supply main by means of anchor tees, flanged fittings, or approved restraining tie rods, as illustrated on the standard detail drawings.

Water service valve boxes shall not be located in driveways. In the event the designed driveway and water service box locations conflict as a result of the final house sitting, the water service box shall be moved to a location to the satisfaction of the Township.

3.8.11.4 Connection to Supply Main

Water service connections 50 mm in diameter and smaller may be tapped into the supply main with the following restrictions:

- For PVC watermain, a stainless steel saddle shall be used for **all** connections.
- The maximum size of a direct tapped connection into a 150 mm watermain is 32 mm in diameter. Larger sized service connections shall be connected by a cast iron fitting factory-tapped for the required service connection size.
- Water service connections 100 mm in diameter and larger shall be made by installing a tee on the supply main.
- Service connections for industrial, commercial, institutional, or multiple dwelling use shall be considered on an individual basis. Fire connections may be required for industrial, commercial, institutional, or multiple dwelling lots.

3.8.11.5 Materials and Fittings

As specified by the Township of Oro-Medonte in this document.

Refer to Township STD. No. 3.8-09.

3.8.11.6 Meters

A water meter and remote reading unit complete with a backflow preventer shall be installed for each water service connection. The location of the water meter shall be approved by the Township prior to the issuance of a building permit. Water services for private property shall be installed on the property to be served and in no case cross a property line into or pass through other private property.

Refer to Township STD. No. 3.8-10.

3.8.12 As-Constructed

- **All** actual watermain obvert elevations at 30 m intervals shall be indicated on the As-Constructed drawings.
- If the difference is greater than 150 mm from design vertical alignment, affected portions of the watermain shall be redrawn in profile.
- If horizontal alignment changes exceed 1.0 m the affected portions of the watermain shall be redrawn in plan.

In addition, the following shall be indicated on the As-Constructed drawings:

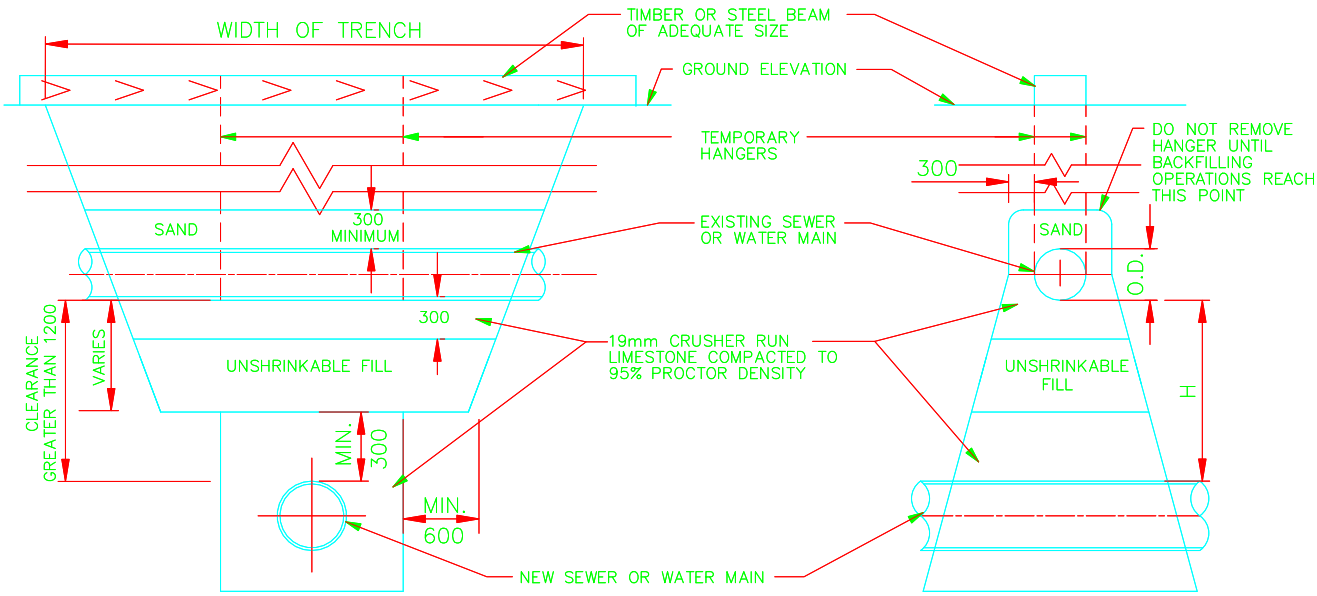
- pipe size, type, class
- swing ties to **all** main appurtenances (valves, bends, tees, etc.)
- chainage from appurtenance along main to main stops
- swing ties from lot corners to the curb stop valve box and the invert elevation of each curb stop

NOTE: The As-Constructed digital drawing file shall be georeferenced.
The standard coordinate system for Oro-Medonte is Universal Transverse Mercator (UTM) Zone 17 with the North American Datum 1983 (NAD83).
The drawing units for all features in the file shall be in metric, set to metres. and un-scaled (1:1).

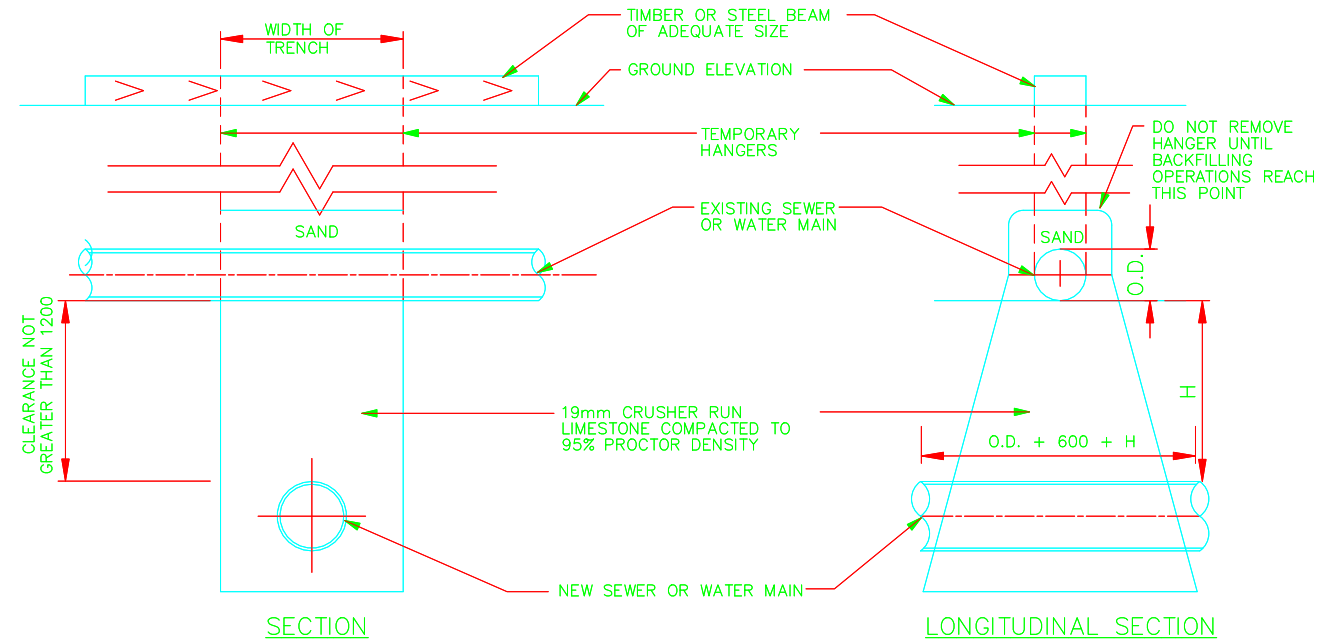
3.8.13 Testing and Acceptance

Connections to existing watermain or water service connections shall not be made until the new watermain has been tested, swabbed, chlorinated and flushed to the satisfaction of the Township and written permission is received from the Township.

Watermain commissioning shall be performed in accordance with the Township document “Watermain Commissioning Protocol (as amended) , and the MECP Watermain Disinfection Procedure (as amended) prior to acceptance of the system as substantially performed.



CLEARANCE GREATER THAN 1200



SECTION

LONGITUDINAL SECTION

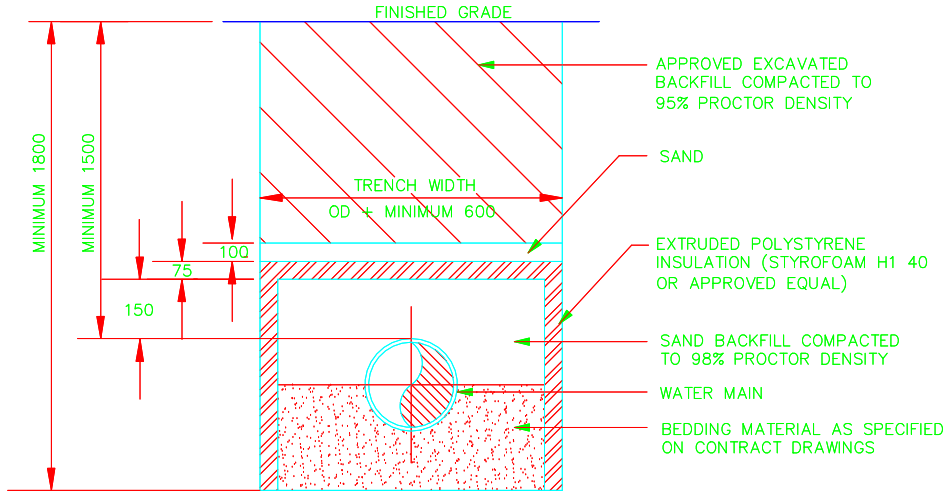
CLEARANCE NOT GREATER THAN 1200

NOTES:

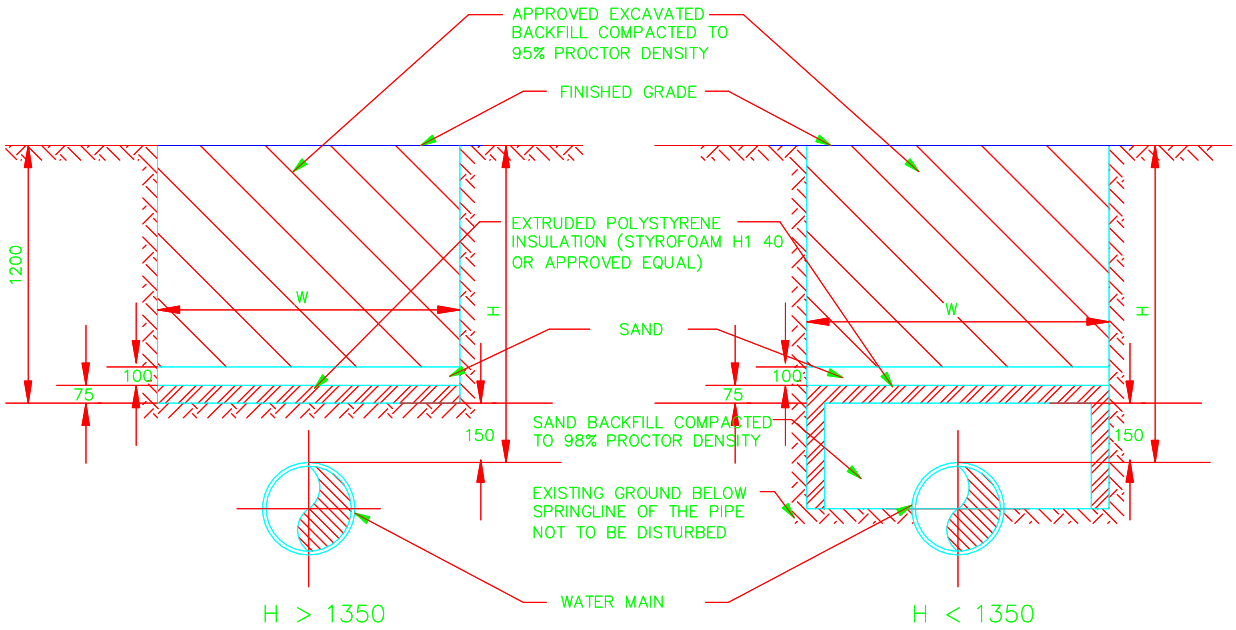
1. THIS DETAIL TO BE USED IN DRY STABLE CONDITIONS ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
SUPPORTS FOR WATERMAIN AND SEWERS CROSSING NEW TRENCHES	STD. No. 3.8-01	



INSULATION OF NEW SERVICES



INSULATION OF EXISTING SERVICES

W = OD + 2(1500−H) OR OD + 600mm WHICHEVER IS GREATER
WHERE W = INSULATION WIDTH
OD = OUTSIDE DIAMETER OF PIPE TO BE INSULATED
H = DEPTH OF PIPE TO BE INSULATED
(MINIMUM 1200mm)

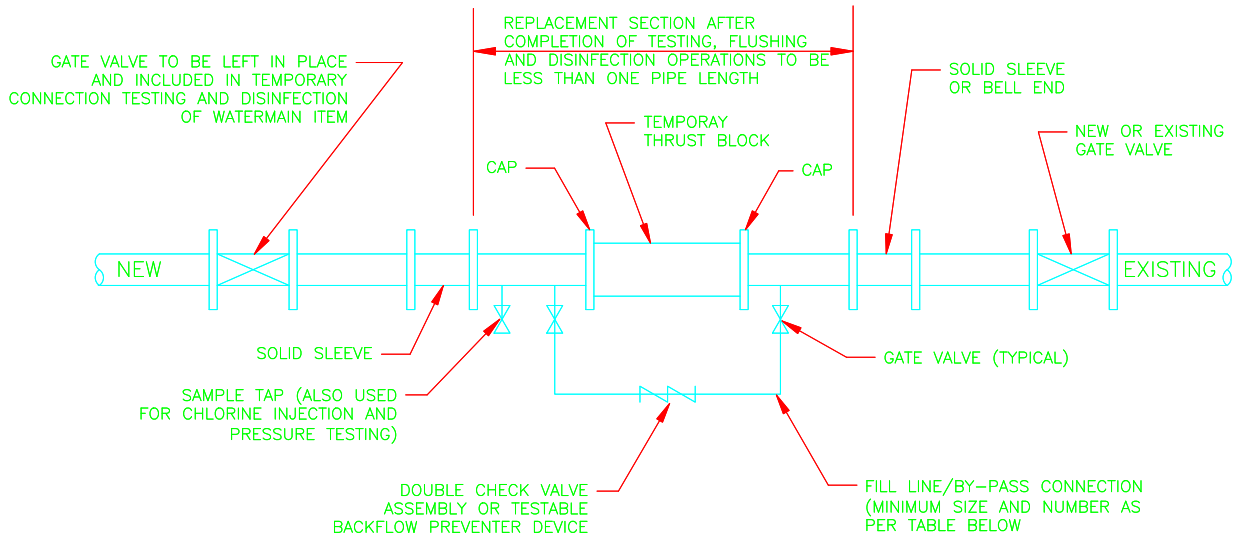
NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE

03 / 2016

TOWNSHIP OF ORO−MEDONTE		APR'D:	DATE: 2012
		DRAWN:	SCALE: NTS
METHOD OF INSULATING WATER MAIN		STD. No. 3.8−02	



TYPICAL TEMPORARY CONNECTION FOR WATERMAINS

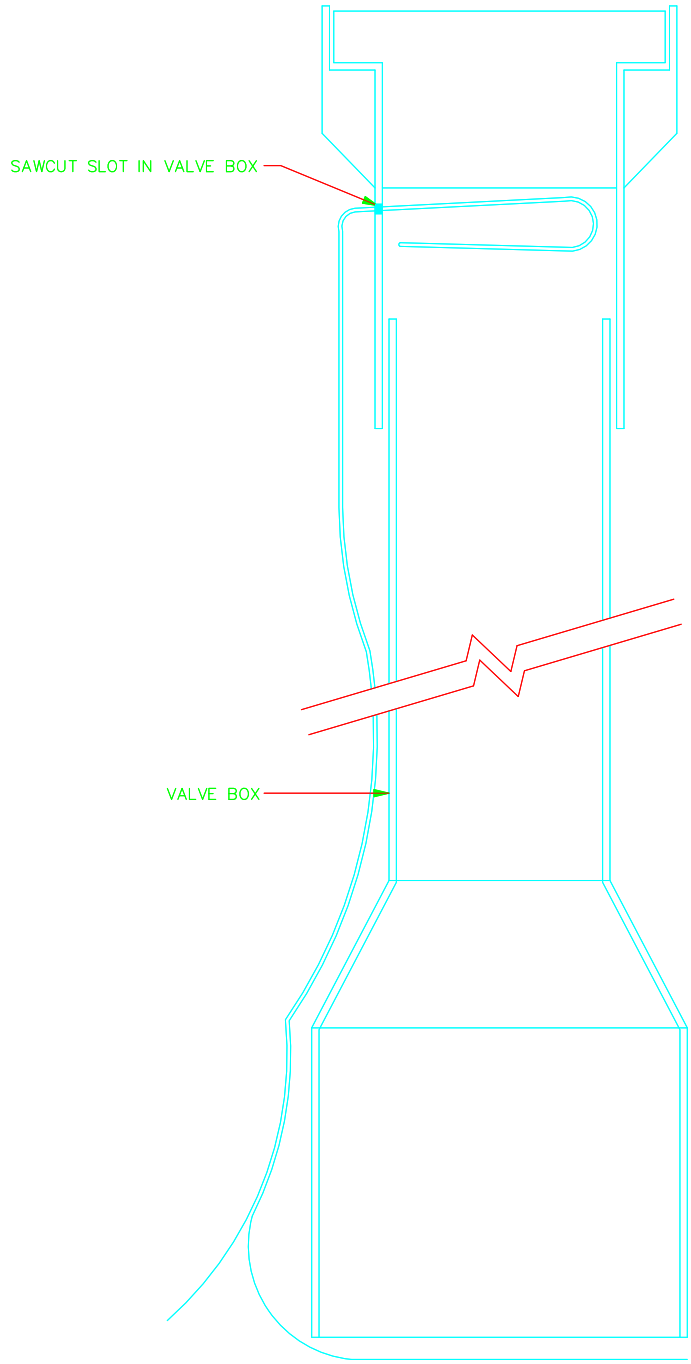
NTS

PIPE DIAMETER	FLOW REQUIRED TO PRODUCE 0.76m/S (APPROX.) VELOCITY IN MAIN	SIZE OF TAP (mm)			NUMBER OF OPEN 64mm HYDRANT OUTLETS
		25	38	51	
mm	l/s	NUMBER OF TAPS ON PIPE			
100	6.3	1	—	—	1
150	12.6	—	1	—	1
200	25.2	—	2	1	1
250	37.9	—	2	2	1
300	56.8	—	—	3	2
400	109.9	—	—	4	2

REQUIRED FLOW AND OPENINGS TO FLUSH PIPELINES (276kPa/40 PSI RESIDUAL PRESSURE IN WATERMAIN)

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
TEMPORARY CONNECTION FOR WATERMAIN	STD. No. 3.8-03	



1

NOTES:

1. TRACER WIRE TO BE COATED No. 12 GUAGE STRANDED C.S.A. TYPE T.W.H. COMPLETE WITH TRACER WAY INC. (PIQUE SUPPLY CORP.) "J" CLIPS – @ 1.5m DISTANCE / 4 CLIPS PER PIPE LENGTH.
2. TRACER WIRE TO BE INSTALLED OUTSIDE LOWER VALVE BOX AND BROUGHT INTO UPPER SECTION OF VALVE BOX AND LOOPED TO BE MINIMUM 450mm IN LENGTH.
3. CONNECTORS USED FOR SPLICING TRACER WIRE SHALL BE WING NUT TYPE, WITH NYLON SHELL AND NON–CORROSIVE STEEL WIRE SPRING.

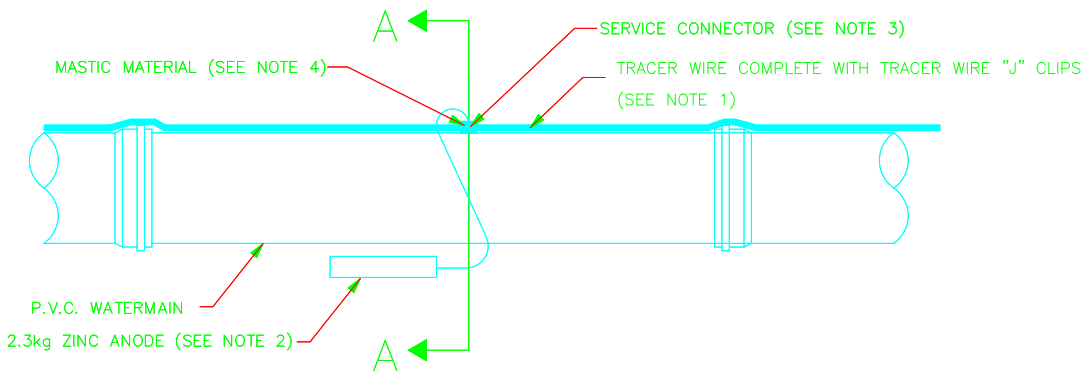
NO.	REVISION	APR'D	DATE
1	Addition of "J" Clips to Tracer Wire Installation		05/23

TOWNSHIP OF ORO–MEDONTE

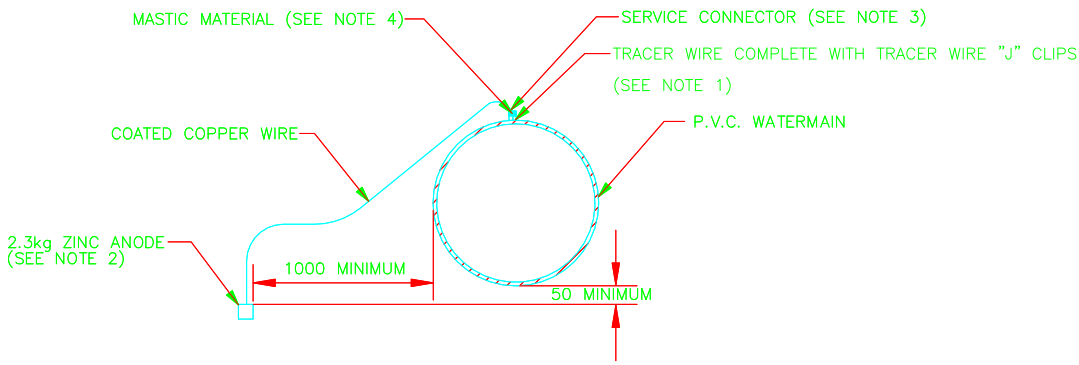
APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

TRACER WIRE ARRANGEMENT AT VALVE BOX FOR P.V.C. WATER MAIN

STD. No. 3.8–04



ELEVATION



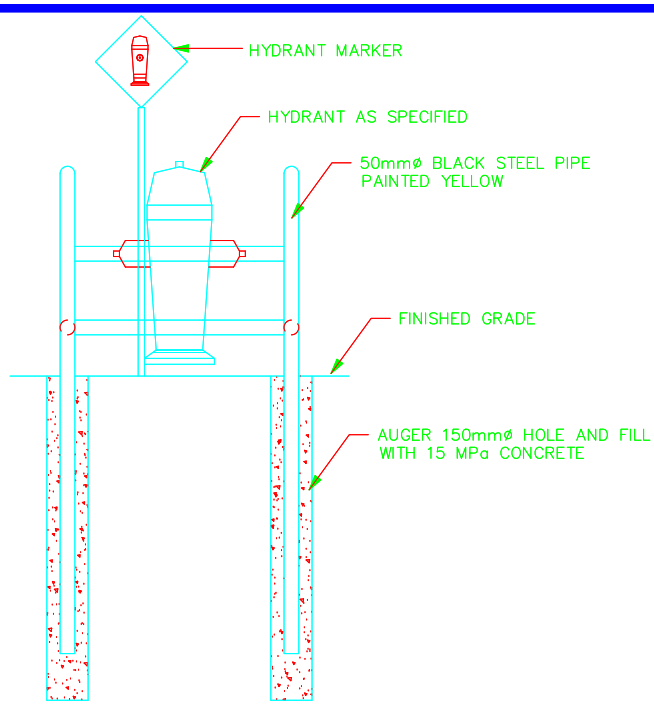
SECTION A–A

NOTES:

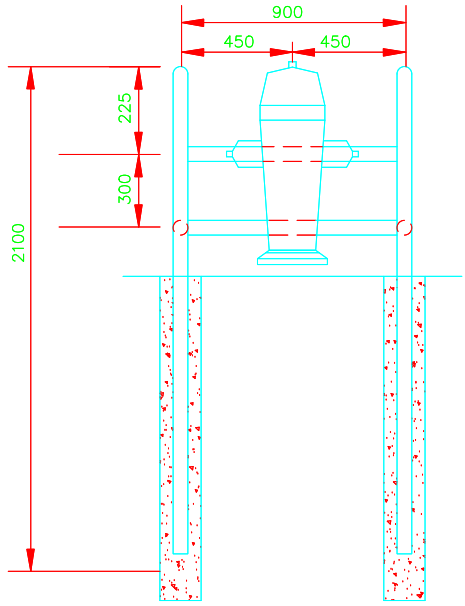
1. TRACER WIRE TO BE COATED No. 12 GUAGE STRANDED C.S.A. TYPE T.W.H. COMPLETE WITH TRACER WAY INC. (PIQUE SUPPLY CORP.) "J" CLIPS – @ 1.5m DISTANCE / 4 CLIPS PER PIPE LENGTH.
2. ONE 2.3 kg ZINC ANODE TO BE SUPPLIED AND INSTALLED IN A MANNER APPROVED BY THE TOWNSHIP OF ORO–MEDONTE. ENGINEER FOR EVERY 500m OF TRACER WIRE INSTALLED.
3. SERVICE CONNECTOR TO BE A 'BURNDY SERVIT', TYPE K.S. MODEL KS20 COPPER OR APPROVED EQUAL.
4. CONNECTOR SPLICE TO BE WRAPPED WITH 'SCOTCHFILL' ELECTRICAL PUTTY OR APPROVED EQUAL.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
6. THE LOCATION OF EACH TRACER WIRE ANODE MUST BE DETAILED ON THE CONTRACT DRAWINGS.

NO.	REVISION	APR'D	DATE
1	Addition of "J" Clips to Tracer Wire Installation		05/23

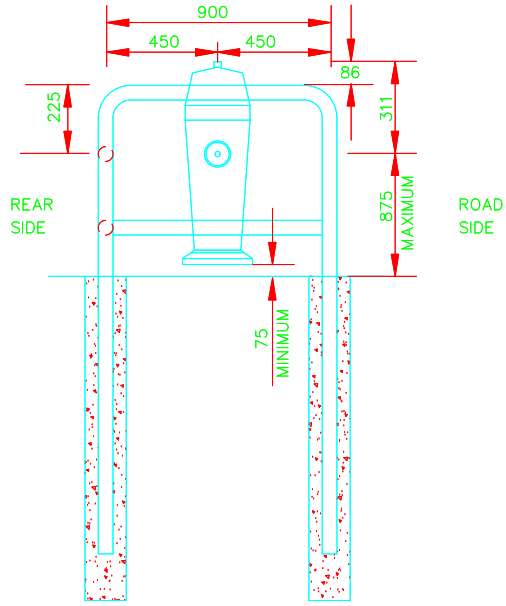
TOWNSHIP OF ORO–MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
CORROSION PROTECTION FOR TRACER WIRES ON P.V.C. WATER MAINS	STD. No. 3.8–05	



REAR VIEW



ROAD SIDE



LEFT SIDE VIEW

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

APR'D:

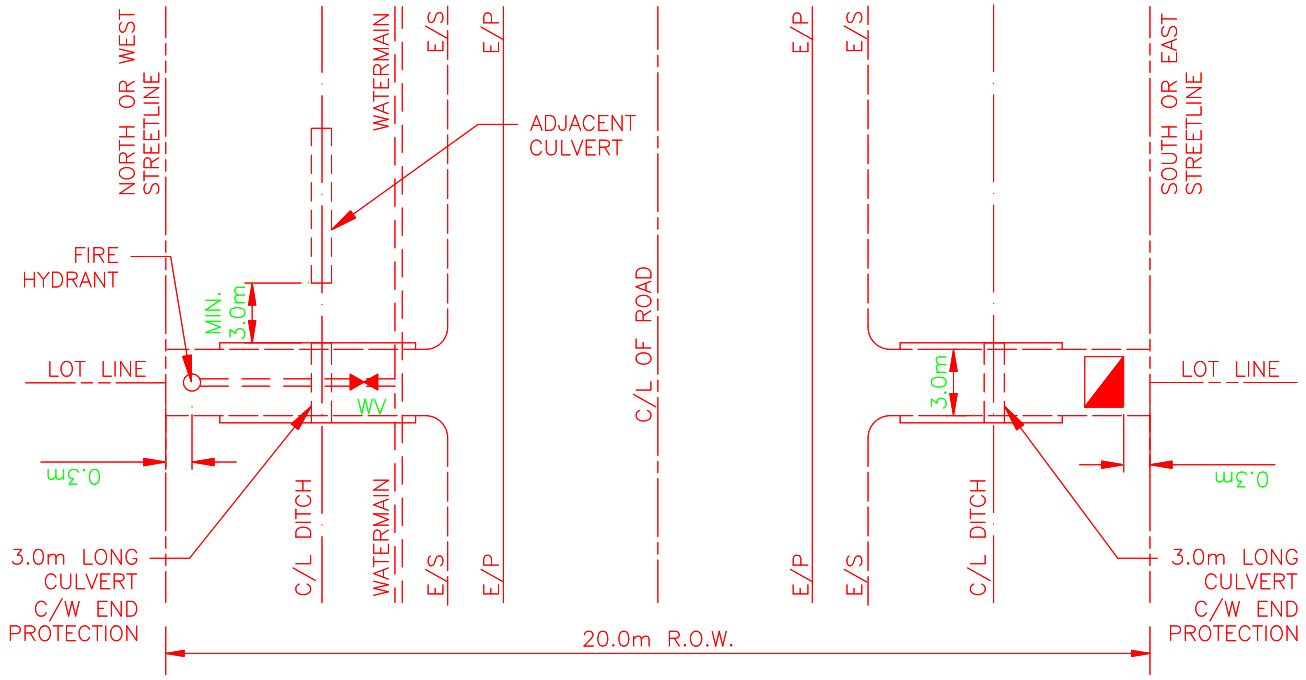
DRAWN:

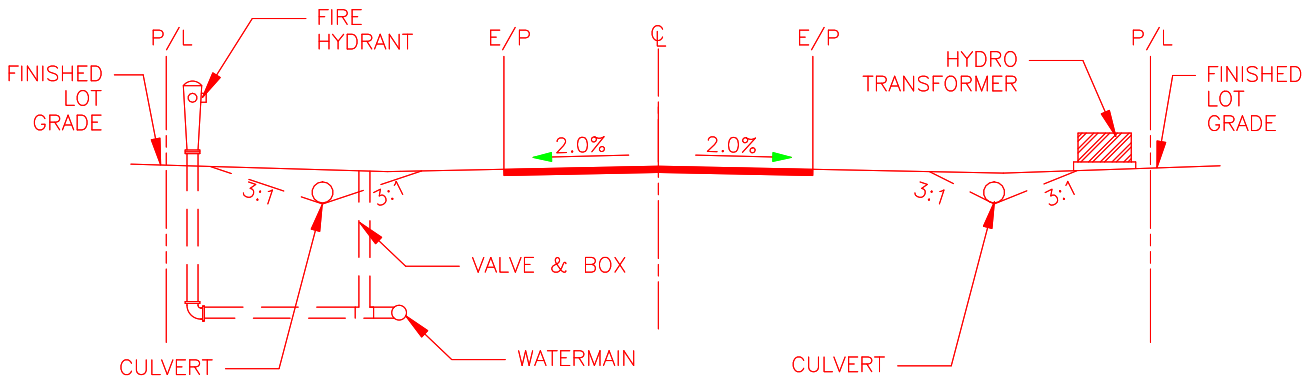
DATE: 03 / 2016

SCALE: NTS

HYDRANT BARRIER

STD. No. 3.8-06





NOTE:
THE CULVERTS END PROTECTION ARE TO BE CONSTRUCTED IN ACCORDANCE WITH DRIVEWAY STANDARDS, WITH THE FOLLOWING EXCEPTIONS:

THE CULVERT TO BE A MINIMUM LENGTH OF 3.0 METRES TO PROVIDE A PLATFORM TO ALLOW PEDESTRIAN TRAFFIC. THE CULVERT MAYBE INCREASED IN LENGTH BUT THE PLATFORM AREA SHOULD NOT BE LARGE ENOUGH TO ACCOMMODATE VEHICULAR TRAFFIC.

THE DIAMETER OF THE CULVERTS WILL BE IN ACCORDANCE WITH THE STORM DRAINAGE PLAN.

MINIMUM 3.0 METRE SEPARATION BETWEEN ACCESS CULVERT AND ADJACENT CULVERT.

TOP OF VALVE BOX TO BE FLUSH WITH ACCESS SURFACE.

THE VALVE STEM MAY REQUIRE AN EXTENSION TO ACCOMMODATE A STANDARD VALVE KEY.

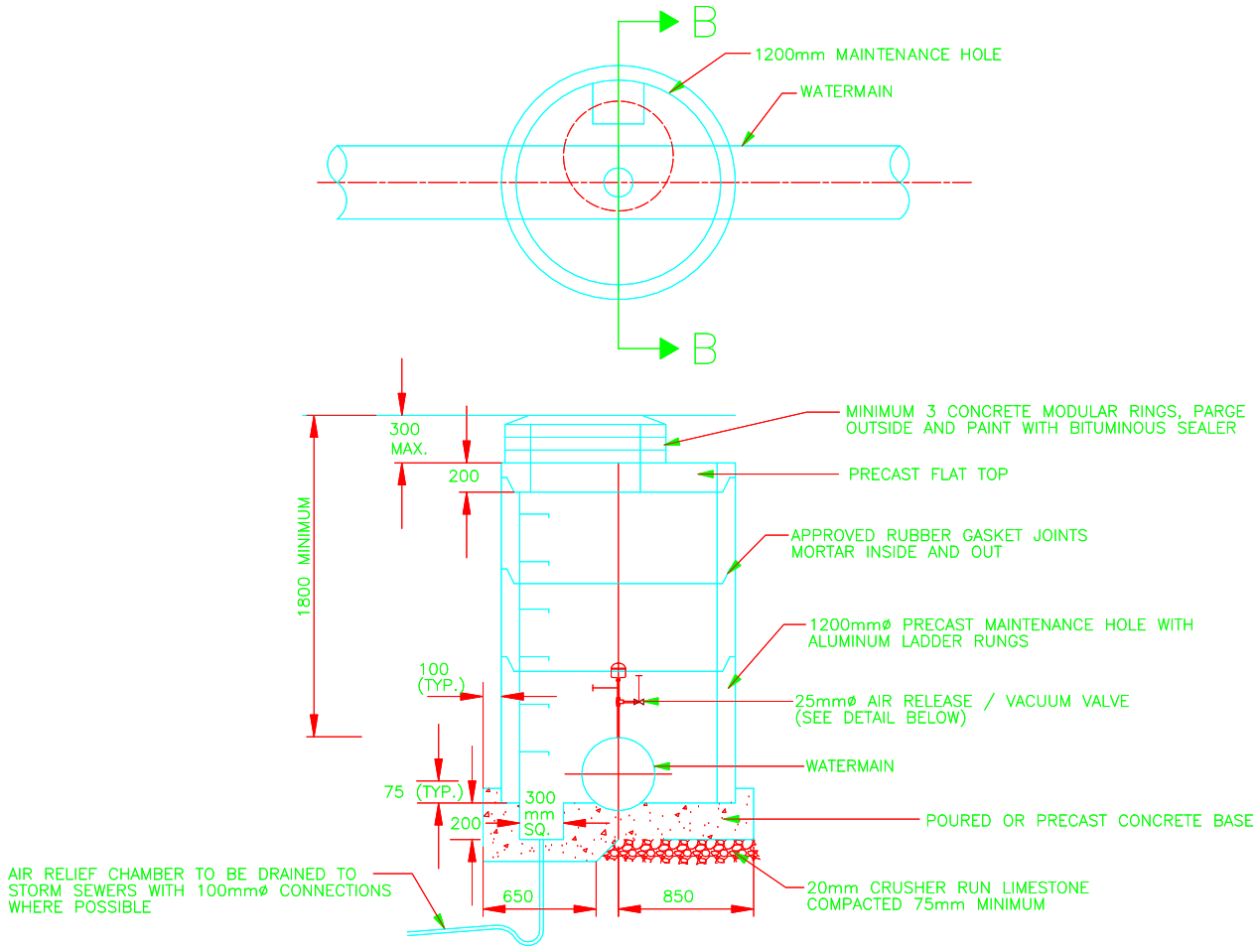
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

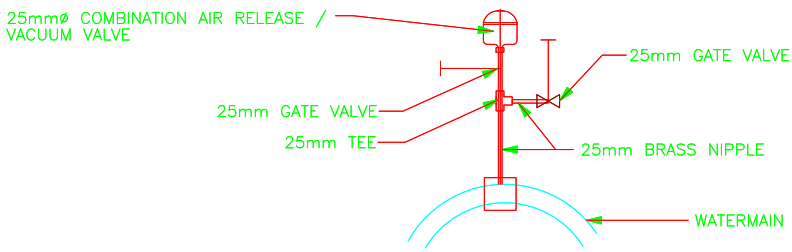
APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

ACCESS CULVERTS FOR FIRE HYDRANTS AND HYDRO TRANSFORMERS

STD. No. 3.8-07



SECTION B–B



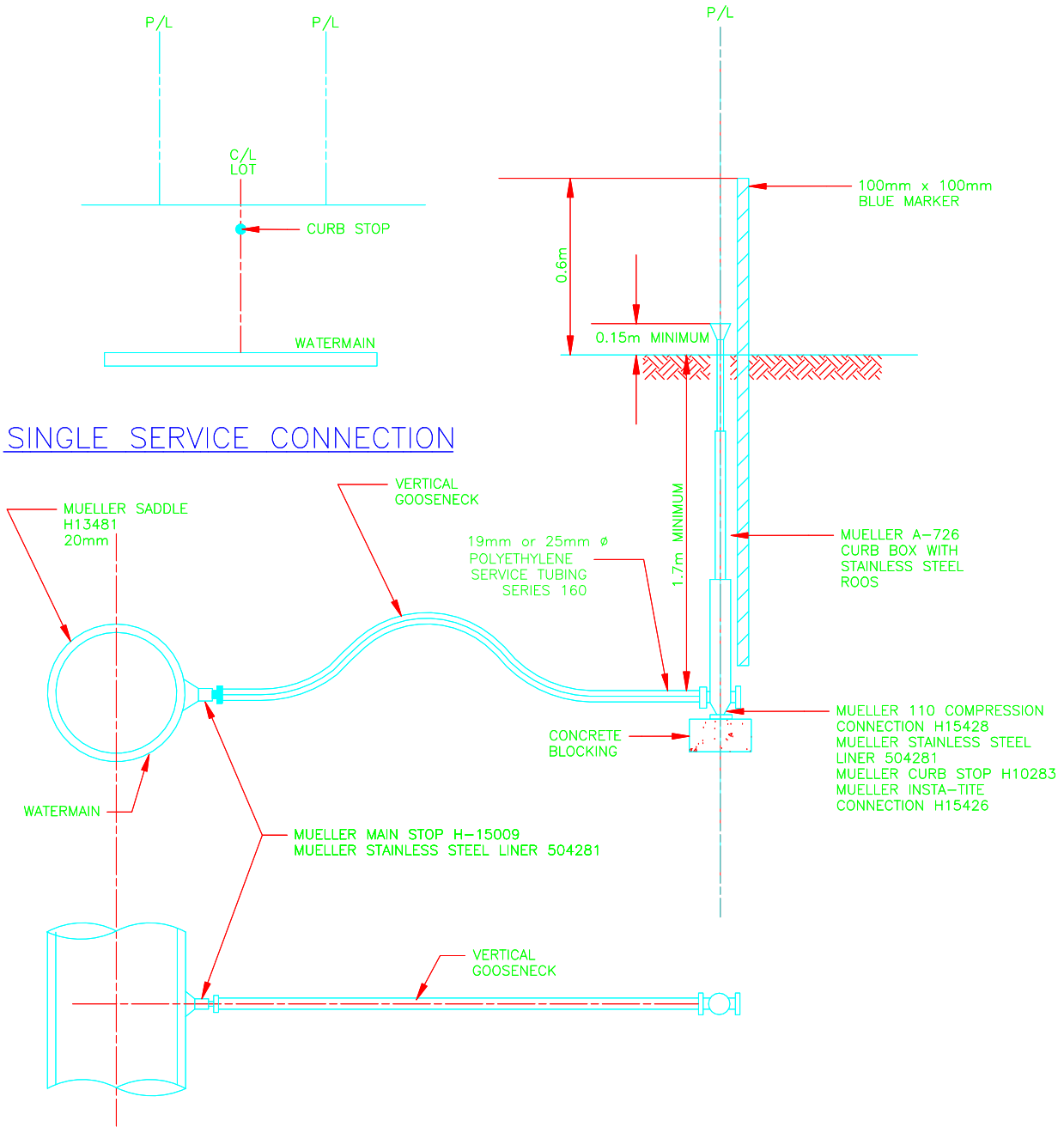
AIR RELEASE VALVE DETAIL

NOTES:

1. ALL FITTINGS TO BE BRASS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
3. GRANULAR 'A' BACKFILL TO BE PLACED TO A MINIMUM THICKNESS OF 300mm ON ALL SIDES AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
AIR RELEASE VALVE IN CHAMBER	STD. No. 3.8–08	



SINGLE SERVICE CONNECTION

PLAN VIEW

NOTE:

APPROVED CATHODIC PROTECTIOM SHALL BE USED WHERE REQUIRED BY ENGINEER.

NO.	REVISION	APR'D	DATE
1	19mm or 25mm dia. Polyethlene Water Service		05/23

TOWNSHIP OF ORO-MEDONTE

APR'D:

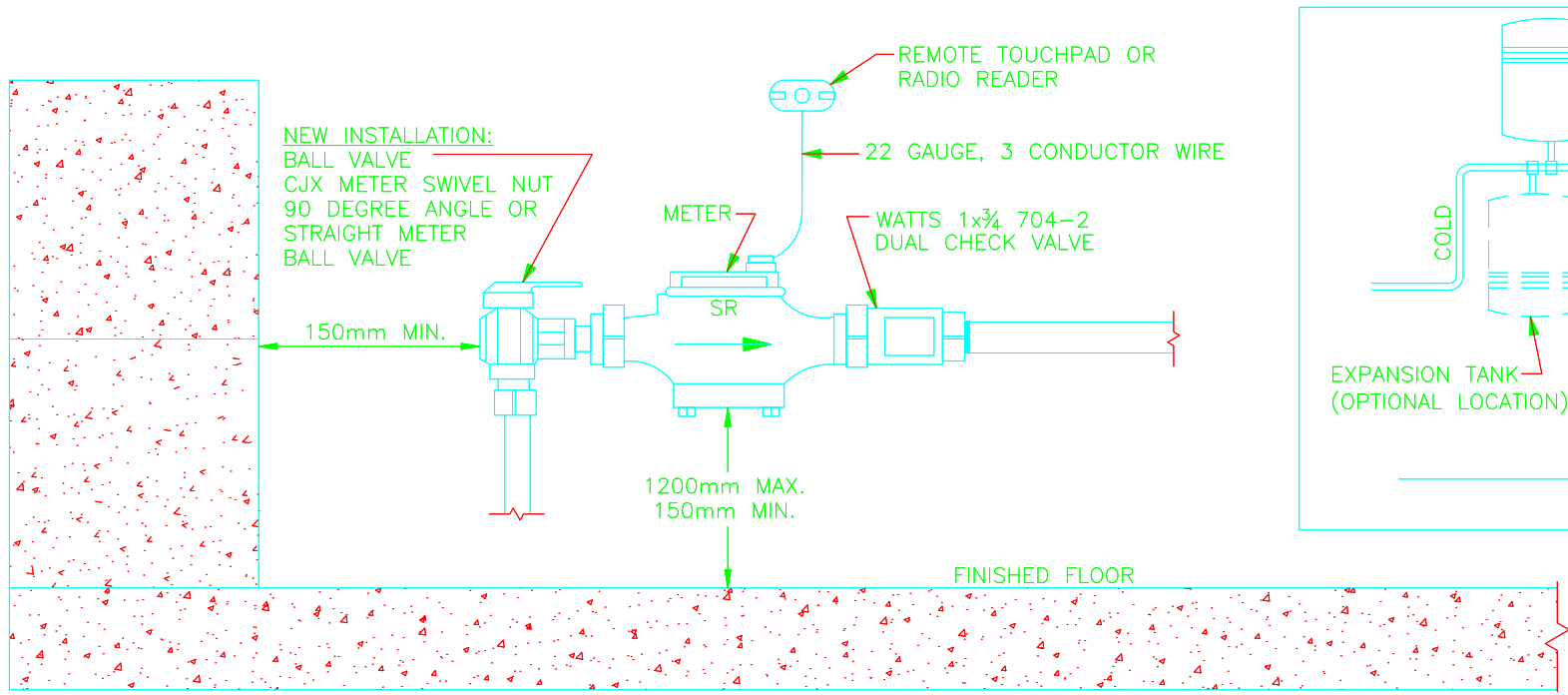
DRAWN:

DATE: 03 / 2016

SCALE: NTS

POLYETHYLENE WATER SERVICE CONNECTION DETAIL

STD. No. 3.8-09



NOTES:

1. METER TO BE INSTALLED NOT LESS THAN 150mm FROM ANY OBJECT. AVERAGE SIZE PERSON SHOULD BE ABLE TO ACCESS METER.
2. EXPANSION TANK TO BE INSTALLED ON THE COLD WATER LINE BETWEEN THE WATER METER PACKAGE AND THE WATER HEATER. WHEN FULL, THESE TANKS WEIGH 50 POUNDS. TANK OR PIPEWORK MAY NEED SUPPORT. TANK TO BE NSF 61 CERTIFIED AND SIZED APPROPRIATELY FOR WATER HEATER SIZE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. AT A MINIMUM TANK TO BE A ST-12 BY AMTROL OR APPROVED EQUIVALENT.
3. PROVIDE SUPPORT FOR THE METER TO SUIT.
4. ENSURE PROPER DIRECTION OF FLOW FOR INSTALLATION OF DUAL CHECK VALVE. VALVE TO COMPLY WITH CSA STANDARD B64.
5. TOUCH PAD TO BE MOUNTED OUTSIDE BESIDE HYDRO METER, OR ON NEAREST EXTERIOR WALL TO WATER METER IF HYDRO
6. NO BRANCHES OR TAPS PERMITTED UPSTREAM OF METER.
7. METER TO BE INSPECTED AND SEALED PRIOR TO OCCUPANCY. CALL ENVIRONMENTAL SERVICES DEPT. FOR INSPECTION AND SEAL OF WATER METER.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

WATER METER INSTALLATION PACKAGE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.8-10

CLAYTON MARK®

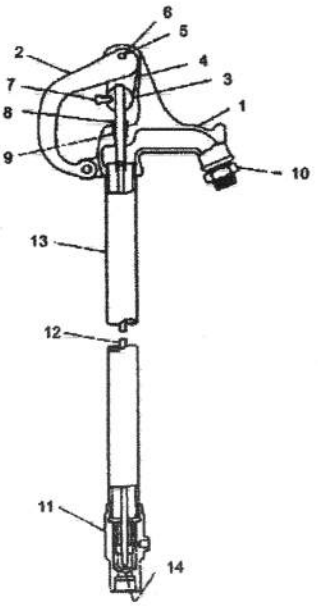
SINCE 1888 ®

5451 HEAVY DUTY YARD HYDRANT

- HEAVY DUTY-BUILT FOR YEARS OF RELIABLE USE
- HIGH STRENGTH STAND PIPE PROVIDES PROTECTION AGAINST DAMAGE
- STAND PIPE HAS SUPERIOR CORROSION RESISTANCE
- STEEL, ZINC PLATED ROD FOR LONG LIFE
- DUAL BYPASS BRONZE BOTTOM VALVE ALLOWS BETTER FLOW WITH LESS RISK OF BLOCKAGE FROM DEBRIS
- COMPONENTS CAN BE REPLACED FROM ABOVE GROUND WITHOUT DIGGING
- LOCKING EYE HOLES ALLOW HYDRANT TO BE PADLOCKED WHEN NOT IN USE.
- INLET 3/4" NPT, OUTLET 3/4" GARDEN HOSE THREAD.

ITEM	QTY	DESCRIPTION	MAT'L OF CONSTRUCTION
1	1	HEAD	CAST IRON
2	1	HANDLE	CAST IRON
3 *	1	CONNECTOR	BRASS
4 *	2	LINK	STEEL-ZINC PLATED
5 *	1	FULCRUM BOLT	STEEL-ZINC PLATED
6 *	1	FULCRUM NUT	STEEL-ZINC PLATED
7 *	1	SQUARE HEAD SET SCREW	STEEL-ZINC PLATED
8 *	1	PACKING NUT	BRASS
9 *	1	PACKING	TEFLON FILLED GRAPHITE
10	1	HOSE ADAPTER 3/4"	BRASS
11	1	BOTTOM VALVE	BRONZE 81-3-7-9
12	1	CLEVIS ROD/ROD ASSEMBLY	BRASS/STEEL-ZINC PLATED
13	1	PIPE	STEEL, GALVANIZED
14 *	1	PLUNGER	BUNA-N/BRASS

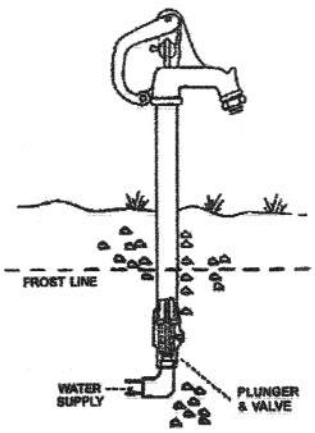
* ITEMS ARE INCLUDED IN YRK1 REPAIR KIT.



HOW A FROST-PROOF HYDRANT WORKS

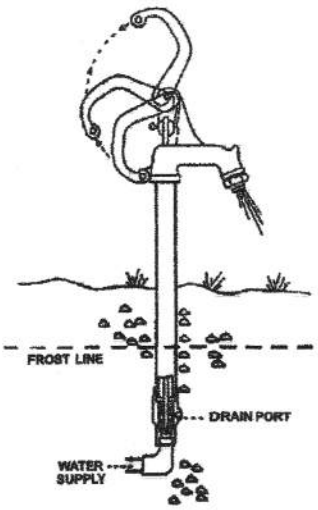
CLOSED

The hydrant is closed and no water is in the riser pipe or head. Water is stopped by the plunger (valve) below the frost line. Protected like this, no freezing can occur.



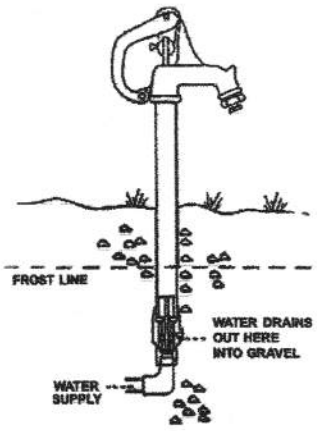
OPEN - WATER FLOWING

Water is made available by raising the handle. This will lift the plunger allowing water to flow and the plunger to seal off the drain hole.



CLOSED - DRAINING

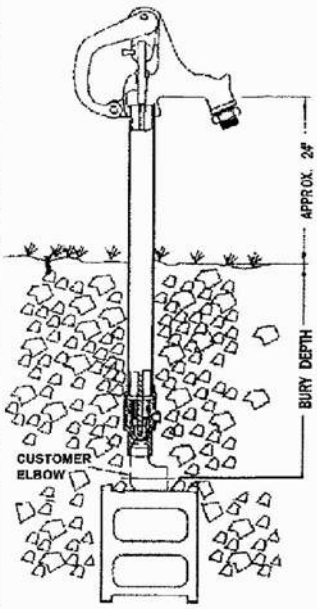
Closing the handle pushes the plunger down to seal off the water and uncover the drain hole. This allows the water in the head and riser pipe to drain back down into the gravel drain bed. The hydrant is now empty and cannot freeze.



NO.	REVISION	APR'D	DATE

	TOWNSHIP OF ORO–MEDONTE	APR'D:	DATE: 03 / 2016
		DRAWN:	SCALE: NTS
	CLAYTON MARK HEAVY DUTY YARD HYDRANT	STD. No. 3.8–11	

5451 HYDRANT INSTALLATION



1. Dig hole for hydrant approximately 2 feet in diameter and 1 foot deeper than the bury depth.
2. FLUSH PIPING BEFORE CONNECTING THE HYDRANT to clear any gravel or other debris that may have collected in the piping during its installation and assembly. If not flushed out of the piping, this debris may jam the hydrant mechanism or clog the flow ports.
3. Make the piping connection but do not bury the hydrant yet. Operate the hydrant to be sure it is operating properly and the piping connections are not leaking. Open and close the hydrant and check for flow and drainage. If leakage continues from the drain port see "adjustment procedure" below.
4. Fill the hole around and below the hydrant with medium size gravel. This will provide a drain field for the hydrant. Without a drain field, the hydrant will not empty itself and it will freeze in cold weather. This will cause damage to the hydrant and result in loss of water and possible flooding damage.

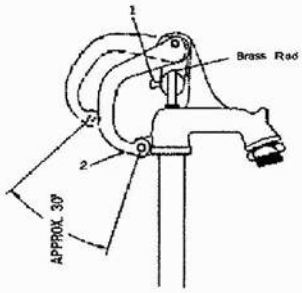
HYDRANT INSTALLATION TIPS

- Never leave hose attached to hydrant after use. This will prevent the hydrant from draining properly and will allow the hydrant to freeze.
- If the hydrant is to be installed inside a barn or other structure, or if it is installed in asphalt or concrete such as a driveway, connect a 1/8" drain pipe or tube to the drain port and dig a remote drain field outside the structure for the drain pipe to empty into. Without this remote piping and drain field, the water from the hydrant drainage will percolate up to the surface around or near the hydrant and will damage the flooring or cause muddy areas in stalls or walkways.
- Water pressure to the hydrant should be regulated to not more than 80 psi. The higher pressures will accelerate wear and may cause leakage that will saturate the ground and drain field and prevent the hydrant from draining. If the hydrant is not allowed to drain, it can freeze and cause damage to itself and cause flooding and loss of water. High pressure will also cause you to have to replace parts and adjust the hydrant frequently. A normal operating pressure would be 20 to 40 psi.
- Saturated ground in the hydrant drain field can prevent the hydrant from draining and may result in freezing. If the area where your hydrant is located is low laying or has a tendency to have standing water, a larger drain field or pit may be required to provide the hydrant a place to drain into.

NOTE: Every 5451 Series hydrant is tested and adjusted at the factory for shutoff at 20 to 40 psi. Adjustment should NOT be necessary upon normal installation. If installed hydrant does not stop water flow use adjustment procedure below.

5451 HYDRANT ADJUSTMENT PROCEDURE

1. Turn water supply OFF.
2. Open hydrant to relieve pressure.
3. Loosen set screw. (Item 1)
4. Push brass rod down as far as it will go by hand to be sure the plunger is touching the seat.
5. Open handle (Item 2) approximately 30° from closed position.
6. Tighten set screw snugly.
7. Turn water supply ON.
8. Operate hydrant and make sure the hydrant is shutting off properly and flowing properly.
9. **If hydrant still does not shut off, repeat steps 1 through 8.**
10. Flow water through hydrant and then close completely to check for proper drainage by:
    a) listening for water draining down pipe or
    b) putting your hand over the hose connection to feel for a vacuum.
    If hydrant does not drain, see step 11.



11. To clear drain hole blockage, close off hydrant spout by using hose cap or by attaching and kinking a hose. Open and close hydrant to allow water pressure to clear blockage. For anti-pollution models, make sure that the small hole in the vent valve is not blocked or plugged. Repeat step 10 to verify proper drainage. If hydrant still does not drain, repeat steps 1 through 10 to fully uncover drain hole.

CAUTION: Do not try to make the shutoff adjustment in one attempt or you may overadjust and cause damage to the plunger and rods. For this reason adjust in multiple small increments.

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www.americangranby.com

NO.	REVISION	APR'D	DATE

	TOWNSHIP OF ORO–MEDONTE	APR'D:	DATE: 03 / 2016
		DRAWN:	SCALE: NTS
	CLAYTON MARK HEAVY DUTY YARD HYDRANT – 2	STD. No. 3.8–12	

WATERMAINS

A. BEDDING AND COVER TO OPSD–802.010, GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL.

B. TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.

C. THRUST BLOCKS TO OPSD–1103.010 AND 1103.020 WHERE SUITABLE SOILS ARE ENCOUNTERED.

D. SERVICE CONNECTIONS TO OPSD–1104.010, 100 mm GRANULAR 'A' EMBEDMENT AND COVER OVER PIPE. TERMINATE AT PROPERTY LINE AT CENTER OF LOT C/W CURB STOP AND BOX, TESTING TAIL TO SURFACE ATTACHED TO A 38mm x 89mm MARKER POST PAINTED BLUE.

E. HYDRANTS TO OPSD–1105.010. DRAIN PLUGS SHALL BE INSTALLED.

F. BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).

G. MINIMUM COVER ON WATERMAIN AND SERVICES TO BE 1.7 m.

H. GATE VALVES, BENDS AND HYDRANT LEADS AND FITTINGS TO BE CONNECTED WITH ROMAX GRIP RING RESTRAINING CLAMP.

I. CLEARANCE BETWEEN WATERMAINS AND SEWERS TO BE A MINIMUM OF 0.5 m VERTICAL WHERE WATERMAIN IS BELOW SEWER OR 2.5 m MINIMUM HORIZONTAL SEPARATION. WATERMAIN SHALL BE ABOVE WHERE POSSIBLE. WHERE WATERMAIN IS ABOVE SEWER, THE MINIMUM SEPARATION TO BE 0.5 m (BEDDING MATERIAL).

J. SERVICE TO OPSD – 1104.010 AND SHALL BE DIRECT TAP.

K. FOLLOWING TESTING, CONTRACTOR SHALL OPERATE EACH WATER SERVICE TO VERIFY FULL FLOW AND PRESSURE AT THE CURB STOP TO THE SATISFACTION OF THE ENGINEER.

L. GENERAL INSTALLATION AND TESTING OF WATERMAIN AND APPURTENANCES TO BE IN ACCORDANCE WITH O.P.S.S. 701 AND ALL SPECIFICATIONS REFERENCED WITHIN THESE SECTIONS.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

NOTES – WATERMAIN

APR'D:

DRAWN:

DATE: 03 / 2016

SCALE: NTS

STD. No. 3.8–13

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3.9 Sanitary Collection Sewers

Prior to the commencement of a design for any sanitary sewage works, the applicant shall obtain confirmation from the Township that adequate treatment plant capacity is available for the development proposed.

Where sanitary service is provided by way of private systems, confirmation of the capacity to accommodate the sanitary flows from the development shall be required by the plant owner / operator and shall be confirmed by the Developer's Consulting Engineer.

Sanitary sewers designed and constructed in accordance with the most recent requirements and specifications of the Township are required to carry domestic, commercial and industrial sewage from each area of the development under consideration. Flow is to be by gravity, in general. Pumped systems **may** be considered only where other alternatives are not possible and only with the approval of the Township.

3.9.1 Sanitary Drainage Plans

All tributary areas used for the determination of the design flows shall be shown on a plan at the scale of 1:1,000. The plan shall indicate the land use, area and population density or number of units.

Standard sanitary sewer design sheets shall be used to compute the design flow for each leg of sewer. Each sanitary drainage area on the plan shall show an identification number along with population and area.

All actual sanitary sewer invert elevations shall be indicated on the As-Constructed drawings. If difference is greater than 150 mm from the design vertical alignment, affected portions of the sewer shall be redrawn in profile. Any maintenance hole which differs from proposed horizontal location by more than 1.50 m shall be redrawn in both plan and profile.

In addition, the following shall be indicated on the As-Constructed drawings:

- pipe size, grade, type, class;
- chainage from MH along main to service tees;
- dimensions from lot corners and elevations for service laterals.

NOTE 1: The As-Constructed digital drawing file shall be georeferenced. The standard coordinate system for Oro-Medonte is Universal Transverse Mercator (UTM) Zone 17 with the North American Datum 1983 (NAD83). The drawing units for all features in the file shall be in metric, set to metres and un-scaled (1:1).

NOTE 2: If As-Constructed grade of sewer differs by more than 1% of the design grade, the Developer's Consulting Engineer shall submit revised hydraulic calculations.

3.9.2 Sanitary Drainage System Design

3.9.2.1 Design Flows

The design flow in each length of sewer shall be computed on the standard sanitary sewer design sheets. For each area entered on the design sheet, the maintenance hole numbers, the size and grade of the sewers, and the plan and profile drawing reference number for each section of the sanitary sewer shall also be shown.
Calculations shall be based be the following:

3.9.2.2 Infiltration Rates

A peak design flow of 0.23 L/s/ha shall be used for infiltration. To satisfy self-cleaning requirements in sanitary sewers, assume dry weather infiltration reduces to zero for several days during dry months.

3.9.2.3 Residential Sewage Flows

The following formula shall be used to calculate the sewage flow for residential areas:

$$Q_{(d)} = \frac{PqM}{86.4} + IA$$

Where: $Q_{(d)}$ = Peak domestic flow plus extraneous flows, in L/s

P = Design population, in thousands

q = Average daily per capita flow, in L/cap/d

M = Peaking factor

I = Unit of peak extraneous flow, in L/s/ha

A = Gross tributary area, in hectares

An average daily per capita flow of 450 L/c/d shall be used for new development. The value of peak extraneous flow shall be 0.23 L/s/ha.

The peaking factor shall be calculated based on the Harmon formula,

$$M = 1 + \frac{14}{4+P^{0.5}}$$

Where: P = population, in thousands

Maximum M – 4.0

Minimum M – 1.5

The design population shall be derived from the drainage area and expected maximum population over a design period of 20 years.

For areas where the lands are zoned for specific residential use, but detailed planning information is not available, the following population densities shall apply for calculation of sewage flows only.

Type of Housing	**Units/Hectare**
Single Family Residential,	12
Multiple Residential	42

When the number and type of housing units within a proposed development are known, the calculation of population for the proposed development shall be based on the following.

Type of Housing	**Person/Unit**
Single Family Dwelling,	2.58
Semi-detached & Duplex	2.58
Townhouse	2.34
Apartment	2.10

Future land use and population shall be based on the approved Official Plan and Secondary Plans of the area and the County of Simcoe Approved Land Budget for Oro-Medonte.

3.9.2.4 Commercial Sewage Flows

A minimum design flow of 28 m^3/ha/day shall be used for the design of **all** local sewers, with a peak factor of 1.60.

- A peak design flow of 0.10 L/s/ha shall be used for infiltration.
- The area shall be based on the gross lot area.

3.9.2.5 Industrial Sewage Flows

An average day design flow of 36 m^3/ha/day for industry shall be used (excludes infiltration and peaking effects).

- The area shall be calculated using the gross area included in the industrial block or development.
- Peak flow and infiltration factors shall be applied as per the latest MECP Design Guidelines.

3.9.2.6 Institutional Sewage Flows

A design flow of 28 m^3/ha/day shall be used for the design of **all** local sewers, with a peak factor of 1.60.

- A peak design flow of 0.10 L/s/ha shall be used for infiltration.
- The area shall be calculated using the gross area included in the institutional site.

3.9.2.7 Pipe Capacities

Manning's formula shall be used in determining the capacity of **all** sanitary sewers. The capacity of the sewer shall be determined on the basis of the pipe flowing full.

- For **all** types of pipe a roughness coefficient of n = 0.013 shall be used.

3.9.2.8 Flow Velocities

- Minimum acceptable velocity = 0.6 m/s
- Maximum acceptable velocity = 3.0 m/s
- The velocity change in a maintenance hole shall not exceed 0.6 m/s.

3.9.2.9 Pipe Grades

The maximum and minimum grades for pipes shall be the grade necessary to meet the maximum and minimum velocity requirements except that the required grade for the

minimum velocity requirement shall not exceed 2% or the road grade where the road grade exceeds 2%.

3.9.2.10 Minimum Sizes

The minimum size for an on-street sanitary sewer shall be 200 mm diameter.

3.9.2.11 Depth of Sanitary Sewers

The minimum desirable design grades shall be 0.5% for **all** local sewers and 1% for the first upstream leg.

The depth of the sewer shall be measured from the final centreline finished road elevation to the top of the sanitary sewer.

In **all** instances, the proposed sanitary sewer shall be installed at a depth sufficient to also service lands external to the site as determined by the Township.

For residential, commercial, and institutional areas the minimum depth shall be 2.8 m. For industrial areas, the minimum depth shall be 2.15 m.

Sanitary sewers shall be located below basement floor elevations to allow for the installation of sewer laterals. Generally, the sanitary sewer shall be at least 1.0 m below the basement floor elevations.

3.9.2.12 Location

All sanitary sewers shall be located as shown on the typical Township roadway cross sections.

In general, this location is along the centreline of the roadway. A minimum horizontal clearance of 2.5 m is required between the sanitary sewer and watermain.

3.9.2.13 Storm Sewer and Watermain Crossings

A minimum clearance of 0.50 m shall be provided at the point of crossing between the outside of the pipe barrels of **all** sewers, services and watermain. The sanitary sewer connections are required to go under the storm sewer.

3.9.2.14 Limits of Construction

Sewers shall be terminated with a maintenance hole at the upstream subdivision limits when external drainage areas are considered in the design. The design of the terminal maintenance holes shall allow for the future extension of the sewer.

3.9.2.15 Sewer Alignment

Sanitary sewers shall be laid in a straight line between maintenance holes unless radius pipe has been designed. Joint burial (common trenching) with storm sewers **may** be considered when supported by the recommendations of a soils report prepared by the Developer's Geotechnical Engineering Consultant.

3.9.2.16 Changes in Pipe Size

No decrease of pipe size from a larger size upstream to a smaller size downstream shall be allowed regardless of the increase in grade.

3.9.2.17 Pipe Bedding

The class of pipe and the type of bedding shall be designed to suit loading and proposed construction conditions. Details are illustrated in the OPSD standard Bedding and Backfill details. In general, Type B bedding and cover (compacted Granular A bedding and cover over the sewer) shall be used for rigid pipe sewers.

Embedment for flexible pipe shall be homogeneous Granular A material in accordance with OPSD requirements.

The width of trench at the top of the pipe shall be carefully controlled to ensure that the maximum trench width is not exceeded unless additional bedding or higher strength pipe is used.

Alternate granular materials for pipe bedding may be specified, subject to the approval of the Township, however clear stone bedding is generally not permitted. In areas where it is difficult to control the infiltration of ground water into the sewer trenches clear stone bedding may be considered provided it is completely wrapped in a suitable geotextile, selected and installed in accordance with the manufacturer's requirement.

Where poor soil conditions and high ground water levels are present, the Developer's Consulting Engineer shall prepare special designs for the Township's approval.

3.9.2.18 Materials

For single family and semi-detached units, multiple family, and other residential blocks, the service connections shall be PVC.

All bends on sanitary service connections shall be long radius, sweep bends.
Sanitary sewers shall be constructed of reinforced concrete pipe, Polyvinyl Chloride (PVC) pipe or polyethylene.

The type and classification of **all** sanitary sewer pipe shall be clearly indicated on **all** profile drawings for each sewer length.

Reinforced concrete pipe shall be used for sewers 600 mm diameter or larger. PVC pipe may only be used for sanitary sewers up to and including 600 mm in diameter.

- Reinforced Concrete Pipe shall be steel reinforced and conform to OPSS 1820.
- Polyvinyl Chloride Pipe (PVC) shall conform to OPSS 1841.
- Dimension ratio (DR) of PVC sewer pipe shall not exceed 35.
- Polyethylene pipe shall conform to OPSS 1840.

For sewer applications requiring pressure pipe, pipe design shall reference the latest MECP guidelines.

3.9.2.19 Maintenance Hole Requirements

Maintenance holes to be precast concrete and shall be designed and constructed in accordance with the most recent OPSS and OPSD. Where the standard drawings are not applicable, the maintenance holes shall be individually designed and detailed.

3.9.2.20 Location and Spacing

Maintenance holes shall be located at each change in alignment, grade, or pipe material, at **all** pipe junctions and at intervals along the pipe to permit entry for maintenance to the sewer.

Maximum spacing of maintenance holes shall be 110 m for sewers 900 mm or less in diameter and 180 m for sewers 975 mm or greater in diameter.

3.9.2.21 Maintenance Hole Details

- Minimum size of maintenance holes to be 1500 mm diameter from the base to 1.80m in height (min.) at which point a taper transition to 1.20m can be made.
- **All** maintenance hole chamber openings shall be located on the side of the maintenance hole parallel to the flow for straight run maintenance hole, or on the upstream side of the maintenance hole at **all** junctions.
- The maintenance holes shall be centered on the sanitary sewer main.
- The maximum change in direction of flow in any sanitary maintenance hole shall be 90 degrees. Flow direction changes at acute interior angles shall not be permitted.
- A maximum invert drop of 0.25 m within the maintenance hole shall be allowed **only** if the design of the sewer cannot be modified to reduce the drop or modified to accommodate a drop structure.
- Wherever feasible, sewer systems shall avoid the use of drop structures.
- If the design of the sewer system is such that the difference in elevation between the maintenance hole inlet and outlet exceeds 0.6 m, then a drop structure shall be required.
- When pipe size does not change through a maintenance hole and the upstream flow velocity does not exceed 1.5 m/s, the following minimum invert drops across the maintenance hole shall be made to compensate for hydraulic losses:

Change in Direction	Minimum Drop (mm)
Straight run	30
≤ 45°	50
> 45° ≤ 90°	80

- When the upstream flow velocity exceeds 1.5 m/s, the drop required through a maintenance hole shall be calculated using the standard calculation sheet, Hydraulic Calculations for Maintenance Holes" found in the latest MECP Design Guidelines.
- For **all** junction and transition maintenance holes, the drop required shall be calculated using the standard calculation sheet "Hydraulic Calculations for Maintenance Holes"

found in the latest MECP Design Guidelines.

- The obvert(s) on the upstream side of a maintenance hole shall in no case be lower than the obvert(s) on the downstream side of the maintenance hole.
- **All** maintenance holes shall be benched as detailed on the Standard Drawings.
- **All** maintenance holes shall have frost straps in accordance with OPSD 701.100.
- When any dimension of a maintenance hole exceeds those on the Standard Drawings, the maintenance hole shall be individually designed and detailed.
- Safety grates shall be required in **all** maintenance holes greater than 5.0m in depth.
- Safety grates shall not be more than 5.0m apart and constructed in accordance with the Standard Drawings. Whenever practical, a safety grates shall be located 0.5m above drop structure inlet pipes.

3.9.2.22 Frame and Grate

All maintenance holes located within the travelled portion of a roadway shall have the rim elevation initially set flush with the surface of the base course asphalt. The concreting and setting of the frame and cover shall be completed in accordance with the applicable OPSS/OPSD.

Modular Maintenance Hole Lift Rings shall be IPEX Lifesaver HDPE type or equivalent.

A minimum of two modular rings and a maximum of 300 mm of modular rings shall be permitted on maintenance holes in new subdivisions.

Prior to the placement of the final lift of asphalt, maintenance hole frames shall be reset to final elevation.

Where maintenance holes are located in areas to be flooded by the major design storm, maintenance hole covers shall be watertight and the maintenance hole is to be suitably vented. **All** other maintenance hole covers shall be as per OPSD 401.010 with Type A closed cover labelled “Sanitary”.

3.9.2.23 Service Connections

All sanitary sewer service connections for single and semi-detached dwellings and townhouse units shall be individual services.

The proposed location(s) for each sanitary sewer service connection(s) shall be shown on the plan and profile drawings and shall be in accordance with the locations specified on the Standard Drawings.

Sanitary connections shall be in accordance with the following Standards:

- OPSD 1006.010 Sewer Service Connection for Rigid Pipe;
- OPSD 1006.020 Sewer Service Connection for Flexible Pipe.

Residential connections shall terminate at the center of the property line with a test fitting, plug suitably braced to withstand test pressures and 89 mm x 38 mm marker placed from the invert of the connection to 600 mm above grade painted green. **All** service connections shall be equipped with a clean out to the surface as illustrated in the Standard Detail Drawings.

3.9.2.24 Connection to Main

The connection to the main sewer shall be made with an approved manufactured tee. Approved saddles shall only be used for connecting to existing sewer mains.

No service connection of a size greater than half the diameter of the main sewer shall be cut into the main sewer. A maintenance hole shall be installed on the main sewer at the intersection of a service connection, which has a size greater than half the diameter of the main sewer except where a 150 mm service connection shall be permitted to connect to a 200 mm or 250 mm main sewer providing an approved manufactured tee is installed and provided that the invert of the service connection is above the spring line of the main sewer.

3.9.2.25 Size

Sanitary connections are to be sized as follows:

Single family residential:

- single 125 mm diameter (min.) PVC SDR 28
- Joints; Bell and Spigot with rubber gasket.

- Watertight test fitting, plugged and braced at property line.
- PVC pipe to be green in colour.

Industrial / Commercial / Institutional and Apartment Blocks:

- designed in accordance with Section 3.3.
- An inspection maintenance hole shall be required on private property 1.50 m from property line to centre of rim.

3.9.2.26 Depth

The depth of the service connections for single-family units and semi-detached units at the property line, measured from the final centreline road elevation shall be a minimum of 2.60 m.

Risers shall be used when the depth to obvert of the sewer main exceeds 4.50 m. The riser connection shall not exceed 3.0 m in depth.

3.9.2.27 Grade

The minimum and maximum grades for sanitary sewer service connections shall be as follows:

Size of Connection	Minimum Grade (%)	Maximum Grade (%)
125	2.0	8.0
150	1.0	6.0
200	0.5	6.0

3.9.2.28 Joints and Bedding

Joints and bedding for connections are to be equivalent to joints and bedding as specified for sanitary sewer pipe.

3.9.3 Testing and Acceptance

All testing shall be carried out from maintenance hole to maintenance hole including house service connections as work progresses. An infiltration or exfiltration test as per OPSS 410 shall be completed on **all** sewers 1200 mm in diameter and smaller. The Township shall determine which test is to be undertaken. Low pressure air testing may be considered.

3.9.3.1 Deflection Test

A deflection test shall be performed on **all** sewers constructed using PVC pipe material.

A Deformation Gauge (Pig) Test as per OPSS is required on **all** pipe works prior to Substantial Completion and Maintenance, but not until a minimum of thirty (30) days after installation.

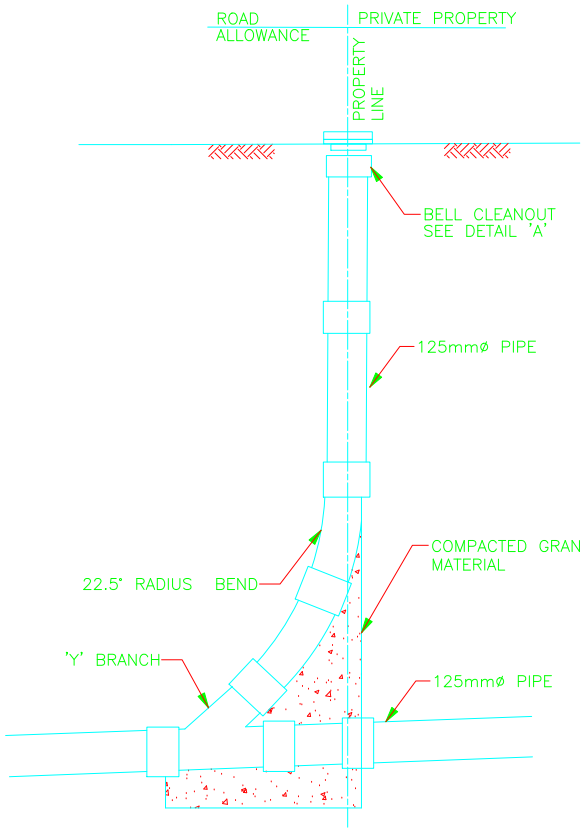
3.9.3.2 Video Record

Closed Circuit Television (CCTV) inspection (including flushing) as per OPSS 409 shall be conducted upon satisfactory completion of **all** other testing, prior to the Township's recommendation for issuance of Substantial Completion and Maintenance and prior to the placement of the final (surface) course asphalt.

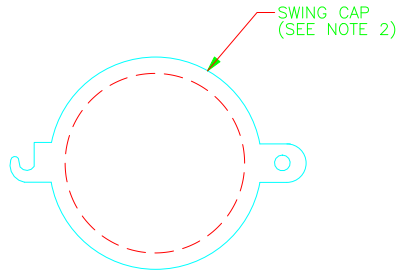
A CCTV inspection (including flushing) shall also be required prior to the issuance of Final Acceptance and Assumption if a lapse of eighteen (18) months since surface course asphalt placement.

A permanent record in DVD form shall be supplied to the Township, illustrating a continuous record of the sewer installations, service connections, maintenance hole, etc.

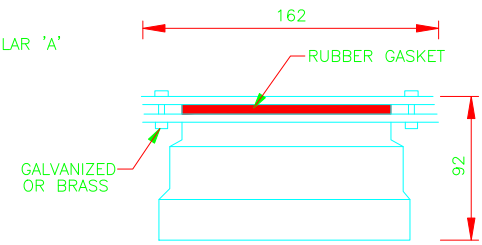
A report identifying any unusual or sub-standard condition(s) shall also be submitted to the Township.



SURFACE CLEANOUT

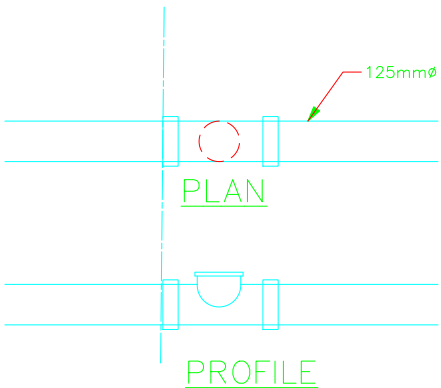


PLAN



PROFILE

DETAIL 'A'



PLAN

PROFILE

RUNNING CLEANOUT

NOTES:

1. ALL FITTINGS TO BE APPROVED CAST IRON OR EQUIVALENT FOR LID. SWEEPS AND TEES TO BE PVC.
2. WHEN CLEANOUT IS LOCATED IN A DRIVEWAY A BRASS CAP IS REQUIRED.
3. CONCRETE CRADLE SHALL NOT BE USED FOR P.V.C. PIPE.
4. SANITARY SEWER CLEANOUTS SHALL BE PLACED WHERE LATERAL SERVICES EXCEED 30m IN LENGTH WITHIN THE PUBLIC R.O.W.
5. WHERE PARTIAL BASEMENTS ARE CONSTRUCTED FOR DEVELOPMENT PROJECTS, ONE CLEANOUT SHALL BE PLACED AT PROPERTY LINE AND ONE PLACED 3.0 METERS FROM HOUSE.
6. CLEANOUTS SHALL NOT BE PLACED IN REGISTERED EASEMENTS.
7. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT WHERE NOTED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

APR'D:

DATE: 03 / 2016

DRAWN:

SCALE: NTS

SANITARY SEWER CLEANOUTS

STD. No. 3.9-01

SANITARY SEWERS

A) M.H.'S TO OPSD–701.XXX AS APPROPRIATE.

B) BENCHING TO OPSD – 701.021. NOTE: MINIMUM HOLE SIZE I WALL IF PRE–CAST RISER SECTION SHALL CONFORM WITH MANUFACTURER'S SPECIFICATIONS.

C) STEPS TO OPSD – 405.010.

D) FROST STRAPS SHALL BE INSTALLED ON ALL MAINTENANCE HOLE AS PER OPSD – 701.100

E) BEDDING AND COVER TO OPSD – 802.010 (FLEXIBLE PIPE), GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL.

F) TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.

G) FRAMES AND COVERS TO OPSD – 401.01 TYPE 'A' (CLOSED COVER).

H) SERVICE CONNECTIONS TO OPSD–1006.020 (125 mm), GRANULAR 'A' EMBEDMENT, TERMINATE AT THE PROPERTY LINE 2.5m RIGHT OF WATER SERVICE (FACING LOT) WITH A TEST FITTING, 125 X 100 REDUCER C/W PLUG AND 38mm x 89mm MARKER POST PAINTED GREEN. MINIMUM GRADE TO BE 2.0%.

I) RADIUS BENDS TO BE USED ON SANITARY SEWER CONNECTIONS WHERE THE ANGLE OF CONNECTION BETWEEN THE SERVICE AND SEWER EXCEEDS 90°.

J) BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).

K) CLEAR STONE WRAPPED WITH FILTER FABRIC CAN BE SUBSTITUTED FOR EMBEDMENT MATERIAL IF APPROVED BY THE ENGINEER.

L) MAINTENANCE HOLE FRAMES TO BE SET TO BASE COURSE ASPHALT ELEVATION AND RAISED PRIOR TO PLACING SURFACE COURSE ASPHALT TO THE SATISFACTION OF THE TOWNSHIP.

M) PIPE SUPPORT AT MAINTENANCE HOLES AS PER OPSD 708.020.

N) ALL MAINTENANCE HOLES, UNLESS EXPRESSLY IDENTIFIED ARE 1500 mm DIAMETER.

O) GENERAL INSTALLATION AND TESTING OF SEWERS AND APPURTENANCES TO BE IN ACCORDANCE WITH O.P.S.S. 407, 408, 409 (CCTV), 410, 421 AND ALL SPECIFICATIONS REFERENCED WITHIN THESE SECTIONS.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

NOTES – SANITARY SEWERS

APR'D:

DRAWN:

DATE: 03 / 2016

SCALE: NTS

STD. No. 3.9–02

3.10 Plan and Profile Drawings

Plan and Profile drawings are required for **all** Township roadways, blocks, and easements where services are proposed within the development, for **all** outfalls beyond the development to the permanent outlet, for **all** boundary roadways abutting the development and for other areas where utilities are being installed below grade. Plan and Profile drawings are to be drawn to a maximum horizontal scale of 1:500 and a maximum vertical scale of 1:50 and are to include the following:

- complete legend
- **all** existing or proposed services, utilities and abutting properties are to be shown in light or background weight lines
- **all** services to be constructed are to be shown in solid lines
- the profile portion of the drawing shall be a vertical projection of the plan portion whenever possible
- **all** road allowances, lots, blocks, easements, and reserves are to be shown and are to be identified in the same manner as on the Registered Plan
- pavement / road base designs for the particular roadway are to be indicated on **all** plan and profile drawings
- **all** curb and gutter and sidewalks shall be shown and dimensioned on the plan portion of the drawing
- where multiple drawings are required for one road, match lines shall be used and tied in to the nearest full station and such station shall be indicated with no overlap or duplication of information
- where intersecting roads or easements are shown on a plan-profile, only the diameter of the pipe and direction of flow of the intersecting sewers shall be shown. This also applies to easements for which a separate plan and profile has been drawn.
- on profile portion of drawings, the type of sewer, diameter, length, and grade shall be shown
- on profile portion of drawings, the watermain diameter and length, shall be shown
- only the type, direction of flow and diameter of pipe shall be shown in the plan portion;
- **all** maintenance holes shall be shown on the plan and on the profile portions of the drawing and be identified by chainage and I.D. number and shall also be referred to

the applicable Standard Drawing or to a special detail on the profile portion of the drawing. **All** invert elevations shall be shown on the profile with each having reference to the north arrow

- **all** sewer maintenance holes which have safety platforms are to be noted
- **all** drop connections are to be noted and referred to the Standard Drawing
- **all** catch basins and catch basin connections shall be shown. Catch basins are to be numbered for easy reference. **All** rim and invert elevations for rear lot catch basins are to be shown
- **all** watermain, hydrants, valves, bends, and fittings, etc. shall be shown, described, and dimensioned on the plan portion of the drawing. In addition, the watermain shall be plotted to true scale size on the profile portion of the drawing, complete with details on the depth of cover
- the location of **all** storm, water and sanitary service connections shall be shown on the plan portion of the drawing using different symbols for each service. These services need only be dimensioned when the location differs from the standard location as shown on the Township Standard Drawings. The connections to **all** blocks in the development shall be fully described and dimensioned (size, length, grade, invert elevations, materials, class of pipe, bedding, etc.)
- the existing and proposed centreline road grades shall be shown every 20 m with stations shown measured in metres (i.e. STA 0+000.00, STA 0+020.00) and at even 10 m intervals indicated in vertical curves
- beginning and end of curve stations, intersections and end stations shall also be shown to two (2) decimal points
- the original ground at centreline and the proposed centreline road profile shall be plotted on the profile. The proposed centreline road profile shall be fully described (length, grade, P.I. elevations, vertical curve data, high point chainages, low point chainages, etc.)
- details of the gutter grades around **all** 90 degree crescents, intersections and cul-de-sac shall be provided on the plan portion of the drawing as a separate detail at a scale of 1:100

- special notes necessary to detail construction procedures or requirements are to be shown
- chainage for the centreline of construction is to be shown on the profile portion of the drawing. P.V.I., B.H.C., E.H.C., B.V.C. and E.V.C. chainages are to be noted
- the basement elevation of **all** existing dwellings on roads where sewers are to be constructed shall be noted on the profile
- **all** existing services, utilities and features shall be shown on the plan portion. Those services and utilities below grade that are critical to the new construction shall also be shown in the profile. Test holes may be required to determine actual elevation of these services and utilities
- profiles of roadways shall be produced sufficiently beyond the limits of the proposed roads, to confirm the feasibility of possible future extensions
- the location of **all** luminaire poles shall be clearly shown on the plan portion
- the proposed location and type of **all** road names and traffic control signs shall be shown on the plan portion
- proposed locations and types of **all** trees to be shown on the plan portion
- where possibility of conflict with other services exist, connections are to be plotted on the profile or a crossings chart included
- the detail information from **all** borehole logs is be plotted on the profile drawings and located on the plan

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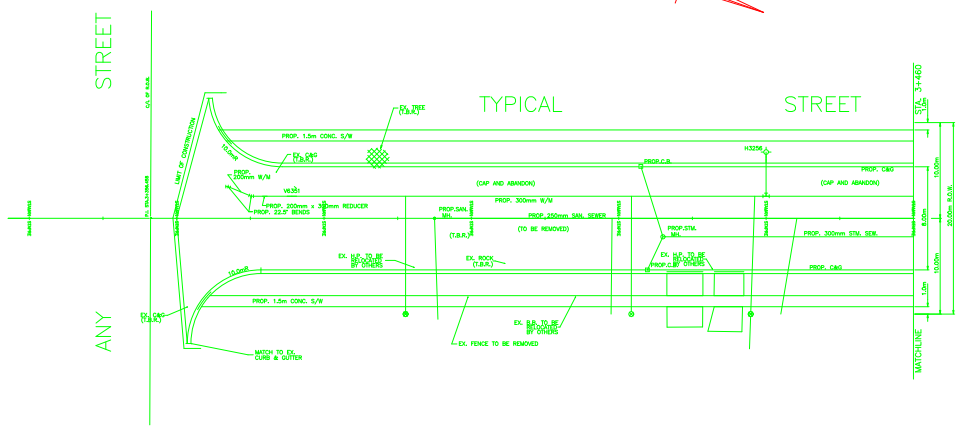

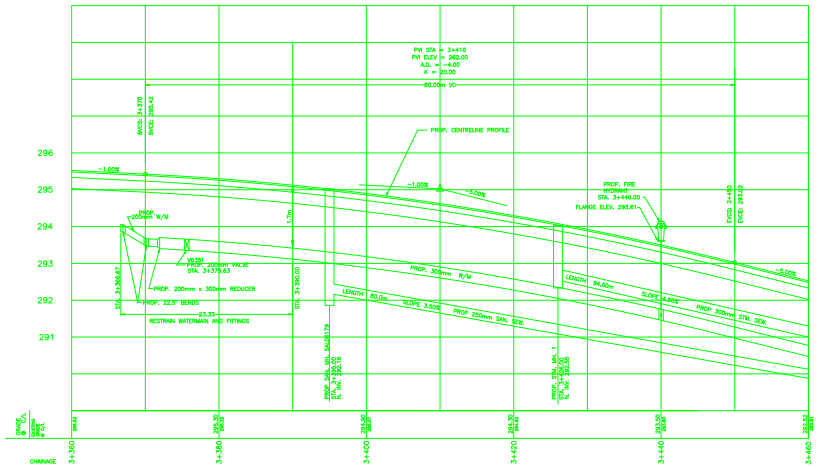

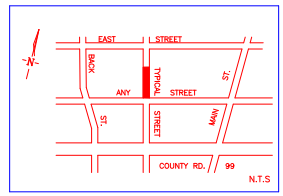

KEY PLAN

TOWNSHIP of ORO–MEDONTE
Development Services Department

STANDARDS FOR
PLAN & PROFILE DRAWINGS

* For illustration purposes only. Consult Township of Oro–Medonte Standards for specific detail.
* Layers and Line Types are turned OFF within this representation.

GENERAL NOTES
1. ALL DIMENSIONS, ELEVATIONS AND SIZES ARE IN METRIC UNITS UNLESS OTHERWISE INDICATED
PIPE SIZES ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.
ELEVATIONS ARE IN METRES UNLESS OTHERWISE INDICATED.

BENCH MARK DATA

NO.	REVISIONS	DATE	APPROVED

TOWNSHIP of ORO–MEDONTE APPROVED
DATE.....
.....
Manager of Development Engineering

TYPICAL SUBDIVISION

TYPICAL STREET
STA. 3+360 TO 3+460

TOWNSHIP of ORO–MEDONTE DEVELOPMENT SERVICES DEPARTMENT

SCALE HOR.	VERT.	DRAWING NO.
DESIGN	DRAWN	SHEET NO.
REVIEWED	DATE	

NO.	REVISION	APR'D	DATE
1	Manager of Development Engineering		05/23
2	Development Services Department		05/23

TOWNSHIP OF ORO–MEDONTE

STANDARD PLAN and PROFILE SHEET

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.10–01

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3.11 Utility Coordination, Composite Utility Plan and Electrical Services Design

3.11.1 Utility Coordination

The appropriate utility company or their approved contractor shall install the services for Telecommunications, Hydro, Gas, and Cable TV.

The Developer shall bear the cost of **all** surcharges for underground installation made and shall grant **all** necessary easements for their services. Where possible, utilities shall be kept 1.0m behind curbs and vertical and horizontal alignment shall conform to plan and inspection prior to backfill.

Compaction of backfill for utility trenches shall be 95% Standard Proctor Density within boulevards and 100% for driveways and under travelled roads.

Utility crossings for new roads shall be placed prior to placement of granular road base material. Utility crossings for existing roads shall be augured or bored under the existing road structure. Should it not be feasible to auger or bore, utility crossings for existing roads shall have the asphalt surface saw cut and removed for a width of the trench plus a minimum of 0.5m out from each side of the trench walls.

No disturbance by road cut shall be allowed on any new road surface within the first three (3) year period after assumption by the Township.

3.11.1.1 Canada Post

The Developer's Consulting Engineer shall submit and liaison directly to Canada Post for the locating of their proposed facilities. **All** proposed locations shall be shown on the Composite Utility Plan. Temporary Post Boxes shall be placed in accordance with the approved final location. **All** community mailbox facilities shall be provided with a paved single lane lay-by and a streetlight.

3.11.2 Composite Utility Plan

The Composite Utility Plan shall be prepared in the same format as the "General Plan of Services" and show **all** the same aboveground information as well as the proposed location of driveways, streetlights, manholes, catchbasins, fire hydrants, valves, Bell

Canada, Hydro, Gas, Cable TV, and Canada Post facilities. **All** locations shall be established and resolved by the Developer's Consulting Engineer in conjunction with the Utility companies and in accordance with the locations shown on the typical cross-section.

3.11.3 Electrical Services Design

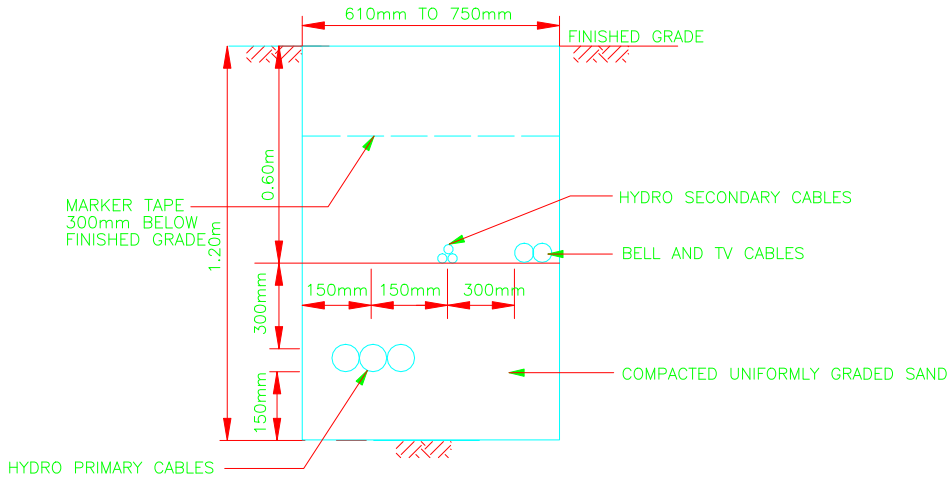
It is the Developer's responsibility to make direct arrangements engage an Electrical Engineer (Developer's Electrical Consultant) to design and construct the primary and secondary electrical distribution system, together with **all** necessary plans.

Where Site Plan proposals abut County or Provincial roads, lighting level plans with supporting computer printouts shall be submitted to the respective road authorities for their approval, if required.

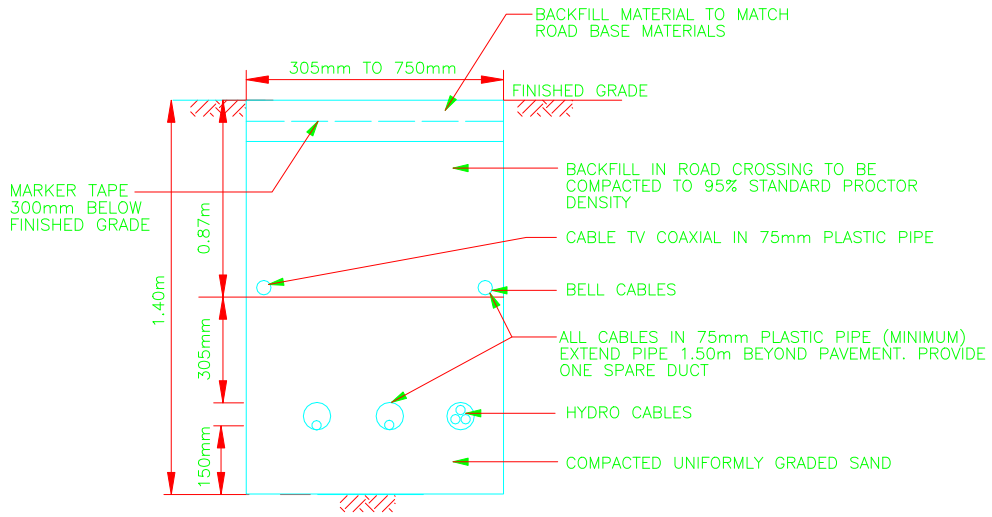
Electrical distribution systems shall generally be designed as buried systems. **All** requirements for the design of the electrical distribution and streetlighting system shall be agreed upon with the Township and the appropriate Electrical Authority.

Plans shall be submitted showing the location of (but not limited to): hydro poles, pole mounts, pole mounted transformers, underground ducts and wiring, pad-mounted type transformers, transformer size, duct banks, size of wiring etc.

Electrical distribution systems shall not be constructed over the watermain.



TYPICAL JOINT USE TRENCH



TYPICAL ROAD CROSSING

1. BACKFILL TO CONSIST OF 150mm OF CLEAN MASON SAND ABOVE CABLES/DUCTS AND CLEAN NATIVE MATERIAL.
2. WARNING TAPE TO BE PLACED PRIOR TO PLACING THE FINAL 300 mm OF BACKFILL.
3. JOINT TRENCH ON OPPOSITE SIDE OF WATERMAIN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
JOINT UTILITY TRENCH AND ROAD CROSSING SECTIONS	STD. No. 3.11-01	

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3.12 Streetlighting

Streetlights are required for **all** roadways and most walkways in the Township, and other locations as directed by the Township. Streetlighting systems are the responsibility of the Developer to construct, and the Developer shall engage an Electrical Consultant to design the Streetlighting system.

The Streetlighting system designs shall be prepared by the Developer's Electrical Consultant and submitted to the Township for approval. The illuminance method as outlined in the **American National Standard Practise for Roadway Lighting ANSI/IES RP-8-14 (2014)** or latest edition is to be used as a guideline.

All streetlighting shall consist of Dark Sky Friendly (Full Cut-Off) luminaires and fixtures. Designs shall show that fixtures have no up-light focus. Fixtures shall be designed in such a way that there is a minimum horizontal and "zero" vertical lighting focus.

The photometrics of fixtures shall be submitted for review with preliminary design submissions of development plans.

Where photometric analysis determines a more appropriate or alternative wattage or spacing, consideration may be given to the alternative design provided that illumination levels do not compromise traffic or pedestrian safety.

The Developer shall arrange with Hydro One for the connection of **all** lighting systems. The estimated cost of the total installation shall be approved by the Township.

The Developer shall provide easements wherever they are required.

3.12.1 Streetlight Locations

- Where possible, pole locations are to be placed on the projection of side lot lines.
- Where community mailboxes are proposed within a plan of subdivision, streetlights shall be located immediately adjacent to them.
- The maximum allowable spacing between streetlights shall be 60 m or as approved by the Township.

- Streetlights are to be provided such there is adequate illumination at **all** intersections.
- Streetlights are to be provided at the end of every cul-de-sac.
- No streetlights shall be placed within 3.0 m of a transformer.
- Staggered arrangement of luminaire poles is not acceptable.
- On curving roadways, lights are to be placed on outer radii where possible with spacing to be reduced by 30%.
- Proposed lighting levels adjacent to Provincial and County roads are to be reviewed and approved by the appropriate Road Authority.

3.12.2 Light Source, Fixture and Pole

- **All** luminaries shall comply with **all** applicable requirements of CSA Standard C22.2 No. 250 13-12, “Light Emitting Diode (LED) Equipment for Lighting Applications.
- **All** luminaries shall be manufactured by CREE Lighting Inc. – XSPA Type (Wattage as per Approved Streetlighting Designs.)
- Landmark luminaries shall be used on collector and arterial roads.
- Each light shall be controlled by a dusk to dawn photo electric cell.
- For local roads poles for 7.35 m mounting height are to be direct burial type round concrete Stresscrete #TEC-30-BPR-CSA “Concrete Poles” complete with 2.4 m aluminium tapered elliptical arm, made by Sylvania or equivalent, 100mm by 175mm hand hole and cover, ground lug at the hand hole and two below grade wiring apertures as per Township STD. No. 3.12-01.
- Stresscrete or approved equal poles of appropriate height and class, with tapered single elliptical aluminium arms of appropriate length, are to be used on collector and arterial roads.
- Streetlights shall be controlled by an electrical panel mounted in Pedestal Solutions Inc. SLT Base Pedestal complete with Meter adjacent to a hydro transformer in accordance with Township STD. No. 3.12-01 and 3.12-02. Installation to meet current Ontario Hydro Guidelines.

3.12.3 Approval and Construction

Approval of plans for streetlighting shall be obtained from the Township. Electrical Safety Authority (ESA) approval for the installed streetlighting system shall be obtained by the developer. The Developer shall guarantee and maintain the lighting until Final Acceptance and Assumption of the development. The Township, upon energization of the streetlighting, shall pay energy charges.

3.12.4 Decorative Streetlighting

Upon specific request to the Township, decorative streetlighting **may** be considered on a case-by-case basis.

Decorative streetlighting is to generally conform to the requirements of **Section 3.12** and **all** sub-sections as previously described, with the following revisions:

- Poles to be Stresscrete Octagonal Class B-Medium Duty Pole, Eclipse Black (S11) polished concrete finish
- Luminaries to be CYCLONE L.E.D. - CLE – 17T4 (Black in Colour)
  All other Luminaire specifications require Specific Approval(s)
- Arm to be Aluminous 72” Decorative Scroll Arm, black colour
- Power pedestal to be Pedestal Solutions Inc. Part #SLS Short Streetlighting Pedestal equipped with Square D 12 Breaker 120/240 VAC Single Phase Panel

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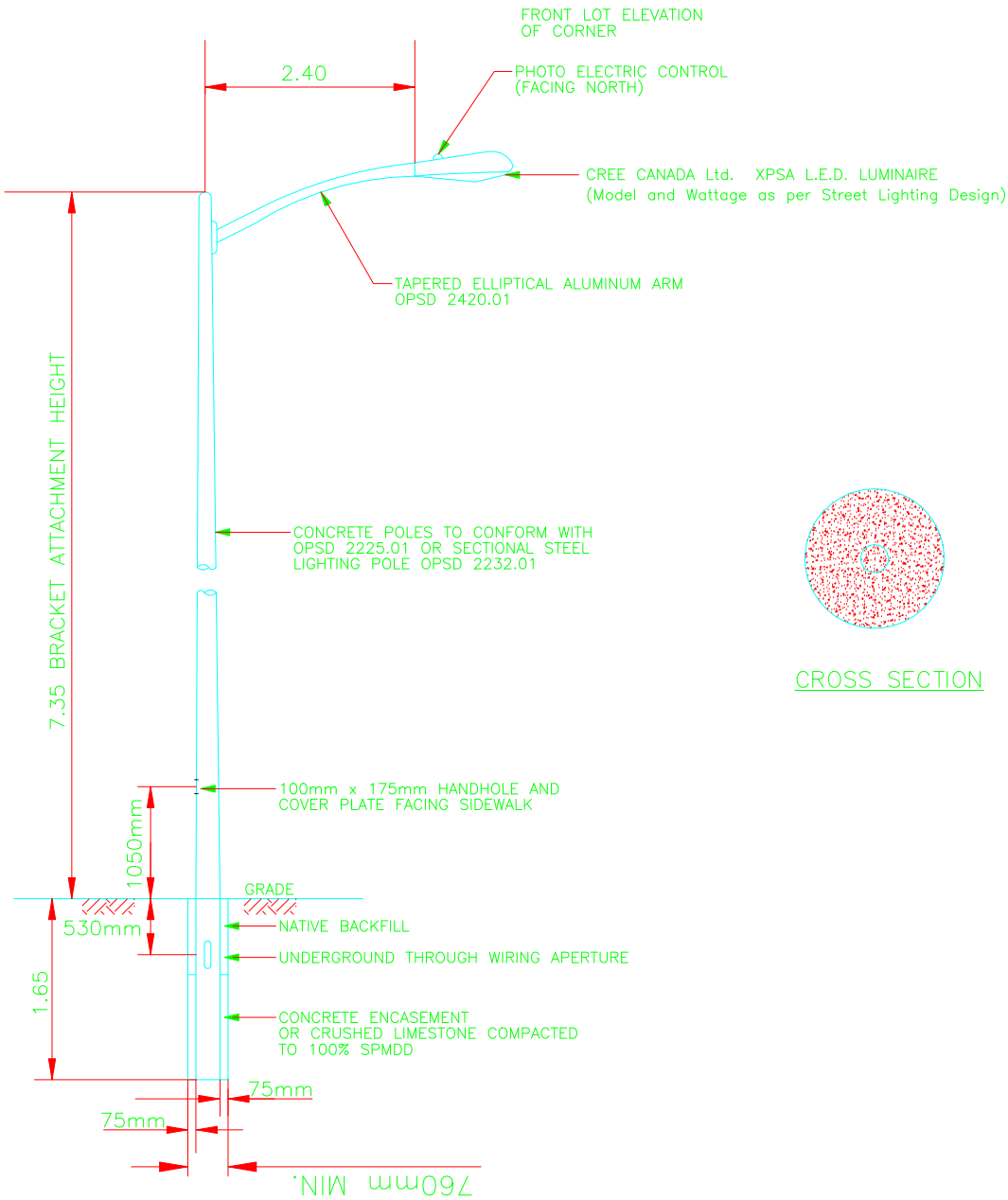


NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. S/L WIRING TO LOOP UP TO HANDHOLE CONNECTION TO LUMINAIRE WIRING BY MEANS OF ESNA FUSE AND CABLE CONNECTOR.

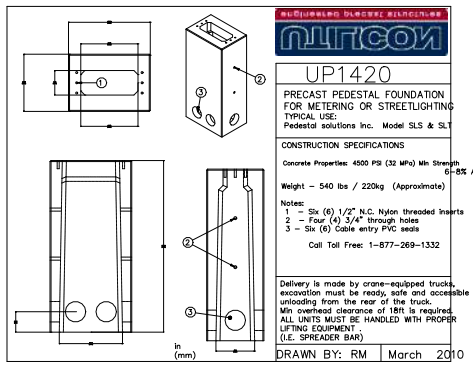
NO.	REVISION	APR'D	DATE

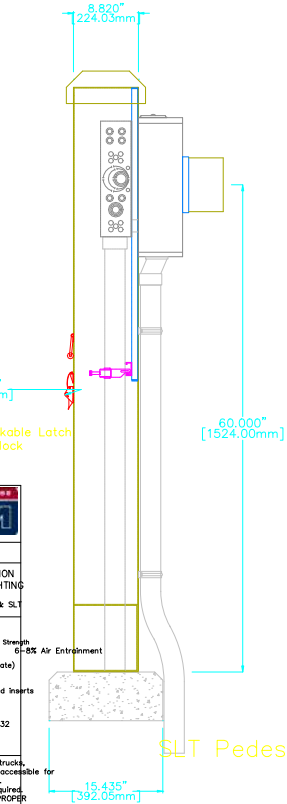
TOWNSHIP OF ORO-MEDONTE

STREETLIGHT POLE and HORIZONTAL TYPE LUMINAIRE

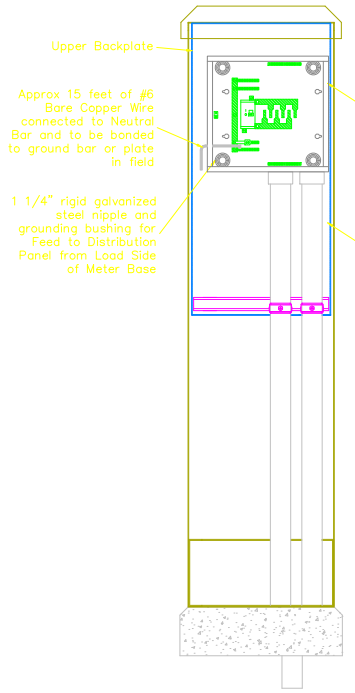
APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.12-01

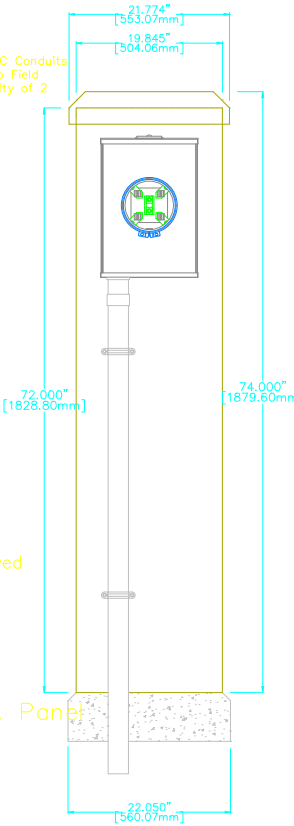




Side View
with Front Covers Installed



Front View
with Front Covers Removed



Rear View

SLT Pedestal with Meter Base and 12 Cct. Panel
(Typical Layout)

Typical Materials Notes:

Enclosure Mat'l-
14 gauge (.083") thick zinc coated (galvanized) sheet metal

Paint Colour-
Byers-Bush Jet Kote BB510GR
Electrostatic powder coat finish

Panel-
Square D cat# QO0112M100C060, 12cct., 2p, 3W Combination service entrance panel

Main Breaker-
Square D cat# QOM60VHL, 60amp 2pole
Wire range #12-2/0 Al/Cu 22kA I.C. rating
or
Square D cat# QOM100VHL, 100amp 2pole
Wire range #12-2/0 Al/Cu 22kA I.C. rating

Load Breakers-
Square D cat# QO series
Single Pole- Q01xxx (xxx=Amperage)
Double Pole- Q02xxx (xxx=Amperage)
(see pedestal part number or schematic drawing for breaker description)

Main Neutral Lug-
Wire range #4-2/0 Al/Cu

Load Neutral Lugs-
Wire Range 1 lug #4-2/0 Al/Cu
3 lugs #14-1/0 Al/Cu, 8 lugs #14-#6 Al/Cu

Fasteners-
4-Plated hex head bolts, 1/2"x13x2" Grade 2 or better
4-Plated 1/2" Flat washers
4-Plated 1/2" Lock washers
for mounting into concrete mounting base

Contactor-
none

Timer Override Switch-
none

Timer-
none

Junction Box-
none

Meter Base-
240/120VAC, 200 amp Microelectric cat# BS2-TCV to meet local Hydro Standards

Typical Part Number Explanation:

SLTx-x-xx

- size of load breaker
- quantity of load breakers
- # of poles on load breakers in first group...1 or 2 pole
- model of pedestal
- Street Lighting Tall

PEDESTAL SOLUTIONS INC.
6552 Ravenshoe Road, Unit #6
Sutton West, Ont. L0E 1R0
Tel: (905) 715-2056
info@pedestalsolutions.com

TITLE: PEDESTAL SOLUTIONS INC.
TALL STREET LIGHTING
PEDESTAL VIEWS

DRAWN BY: RAD	PART NO.: SLT TYPICAL
CHECKED BY: CB	DWG NO.: SLT TYPICAL
SCALE: NONE	
	REVISION: A
DATE: APRIL 23, 2018	PAGE: 1 OF 1

NO.	REVISION	APR'D	DATE
1	PEDESTAL CHANGE	DJS	08/19

TOWNSHIP OF ORO-MEDONTE

APR'D:
DRAWN:
DATE: 03 / 2016
SCALE: NTS

STREET LIGHT PEDESTAL

STD. No. 3.12-02

3.13 Traffic Signs / Signals and Pavement Marking

3.13.1 Signs

Prior to construction, an information sign shall be placed at every access point to the subdivision detailing:

- noting that the subdivision is **Unassumed**
- the Name of the Subdivision
- the Developer and phone #
- the General Contractor and phone #
- the Developer's Consulting Engineer and phone #
- phone numbers for each of these companies **shall be** posted on this sign.

The following types of signs shall be posted on Township R.O.W.'s:

- Municipal Numbering
- Road Name Signs
- Traffic Control and Advisory Signs
- Municipal Information Signs

All signs so installed shall be done so in accordance with the latest edition of the Ontario Traffic Control Manual and standard road name signs approved by the Township of Oro-Medonte.

Unless specifically authorized by the Township, no sign, fingerboard, notice, or advertisement of any kind shall be posted or deposited on road allowance under the jurisdiction of the Township.

3.13.1.1 Municipal Address Numbering

The Developer is responsible for obtaining designated Municipal Address Numbering for each and every lot from the Municipal Office. The designated Municipal Address Numbering shall be shown on the Overall Lot Grading Plan inside the box designating the location of the house. The required location for the installation of Municipal Address Numbering signage is shown on Township Standard 3.13-02.

3.13.1.2 Road Name Signs

The naming of **all** newly created roads under the jurisdiction of the Township shall meet with the Township's approval and shall not be in conflict with any existing road name. **All** road names shall be submitted to the Township for approval in accordance with the Township's Street Naming Policy.

Unless specifically stated otherwise, it is the responsibility of the Developer to supply and erect road name, regulatory and parking control signs in a location approved by the Township as shown in Township Standard 3.13-03.

3.13.1.3 Traffic Control and Advisory Signage

All Traffic Control and Advisory Signs shall conform to the current revised standards of the Ontario Traffic Manual.

3.13.1.4 Access / Haul Route / Information and Directional Signage – During Construction

The Developer shall indicate supplier and contractor Access and Haul Routes, Informational and Directional Signs to be used during construction. The location **all** pertinent information shall be erected and maintained at every access point to the subdivision, as needed to satisfy the Township, and such that there is the least amount of disturbance to the adjacent landowners.

The Developer is responsible to maintain this signage until Final Acceptance and Assumption by the Manager of Development Engineering or otherwise directed by the Township.

Upon completion of base course asphalt, the Developer shall place signage at each point of ingress / egress to the subdivision stating the following:

THIS ROAD UNASSUMED BY THE TOWNSHIP OF ORO-MEDONTE
USE AT OWN RISK

Each sign shall be 450 mm wide by 600 mm high with black letters on white reflectorized background, mounted on "U' channel posts, 3.65 metres in height.

3.13.1.5 Location of Signage

Traffic control and advisory signs shall be located as shown on the Township of Oro-Medonte Standard Drawings. In cases where the positioning of the signs is not covered by the standard drawings, the location shall be in conformance with the Ontario Traffic Manual or the Highway Traffic Act Regulations for Ontario.

All signs, with exception of “Parking” signs, shall be mounted approximately at right angles to the direction of and facing the traffic that they are intended to serve. On curved alignments the angle of placement shall be determined by the course of the approaching traffic rather than by the roadway edge at the point where the sign is located. Signs for different purposes shall not be placed closer together than 30 m. Parking signs shall be mounted facing 30 – 45 degrees to the flow of traffic.

3.13.1.6 Erection of Signage

All traffic control signs shall be mounted on galvanized steel punch out type or Uniflange type posts, 3.65 m in length. Channel posts shall be a minimum 14 gauge thick and a minimum width of 45 mm. The posts shall be pre—punched with a minimum of 24 holes at 50 mm centres compatible with standard bolthole arrangements for traffic control signs. Signs shall be individually erected on separate posts.

Traffic control signs shall be erected by the Developer at the completion of the base course asphalt road construction and prior to the issuance of Building Permits. Signs shall be maintained by the Developer until Final Acceptance and Assumption by the Township.

3.13.2 Traffic Signals

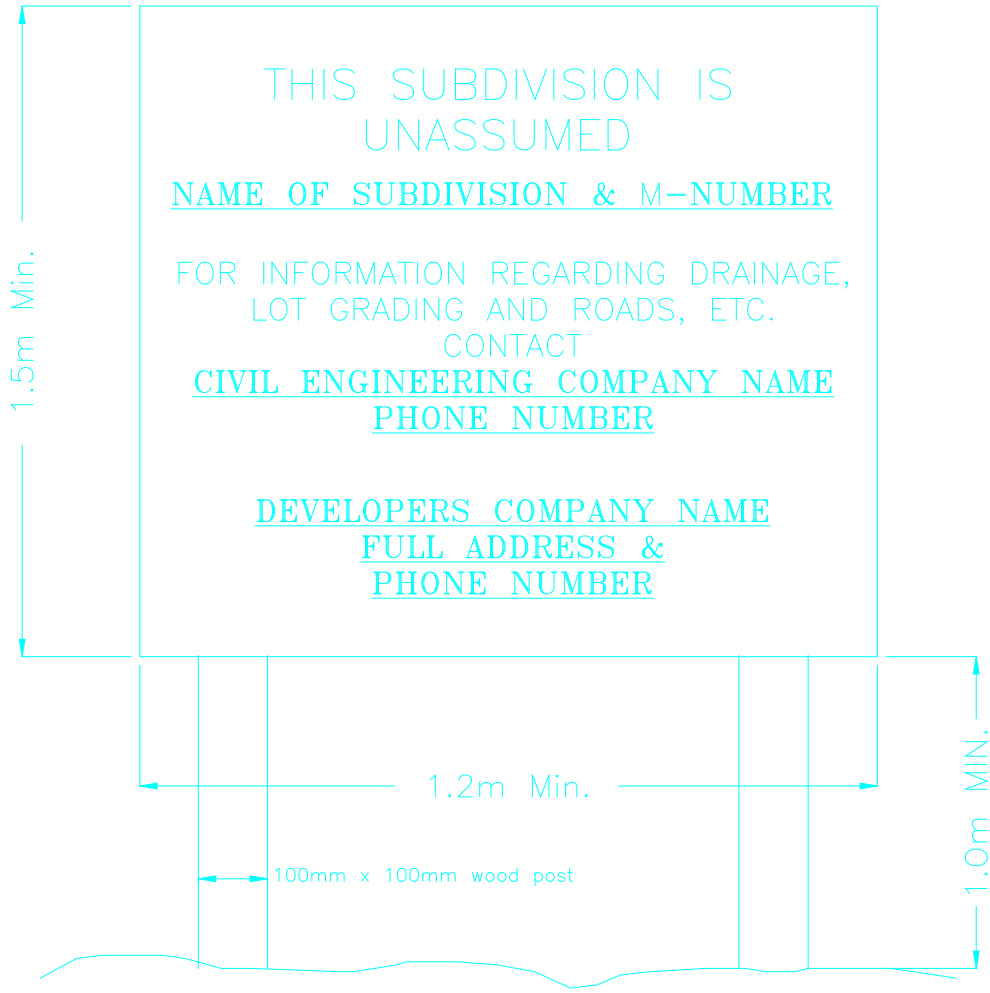
Where it has been determined by a qualified Traffic Engineer that traffic signals are required; the traffic signals shall be designed on individual site-specific basis and shall conform to Ontario Traffic Manual, Book 12.

3.13.3 Pavement Markings

The Developer shall design pavement markings for **all** roadways over two lanes in width or as required by the Township. The design shall be in accordance with the Ontario Traffic Manual, Book 11 and approved by the Township.

The pavement markings shall be installed on both the top course of asphalt and the base course of asphalt. The Developer shall be responsible for stop bars on roadways that are up to two lanes in width.

All roadway markings shall be installed in accordance with OPSS 532.



NOTES:

1. INFORMATION SIGNS:
ALL INFORMATION SIGNS SHALL BE ON A MIN. OF 19mm PLYWOOD BLANKS WITH WHITE ENGINEERING GRADE BACKGROUND AND BLACK LEGEND.
2. MOUNTING:
ALL SIGNS ARE TO BE MOUNTED ON 100mmx100mm POSTS AND ARE TO BE LOCATED WITHIN THE RIGHT OF WAY IN A LOCATION THAT WILL NOT BLOCK SIGHT LINES TO THE MOTORING PUBLIC.

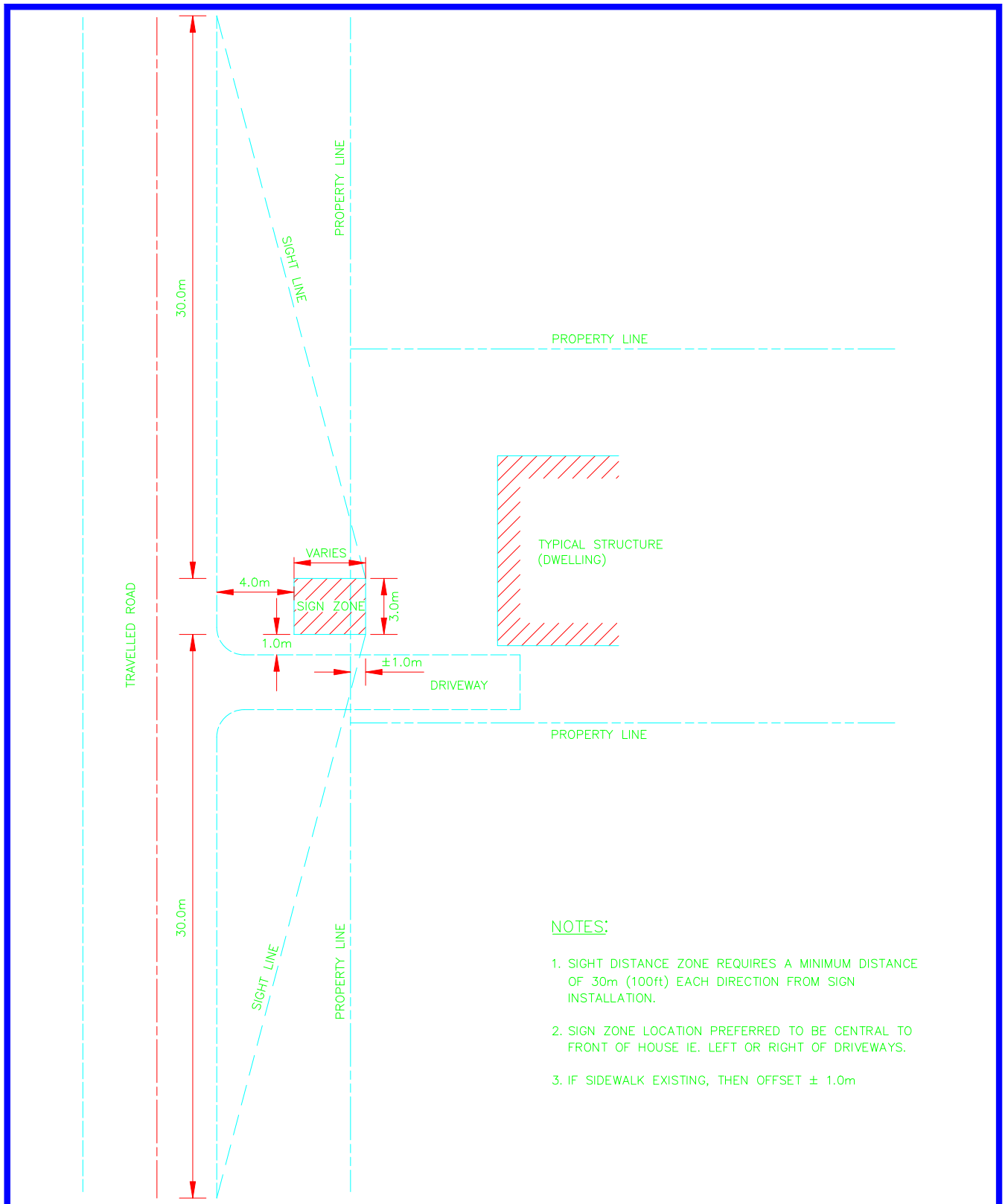
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

SUBDIVISION INFORMATION SIGN

STD. No. 3.13-01



NOTES:

1. SIGHT DISTANCE ZONE REQUIRES A MINIMUM DISTANCE OF 30m (100ft) EACH DIRECTION FROM SIGN INSTALLATION.
2. SIGN ZONE LOCATION PREFERRED TO BE CENTRAL TO FRONT OF HOUSE IE. LEFT OR RIGHT OF DRIVEWAYS.
3. IF SIDEWALK EXISTING, THEN OFFSET ± 1.0m

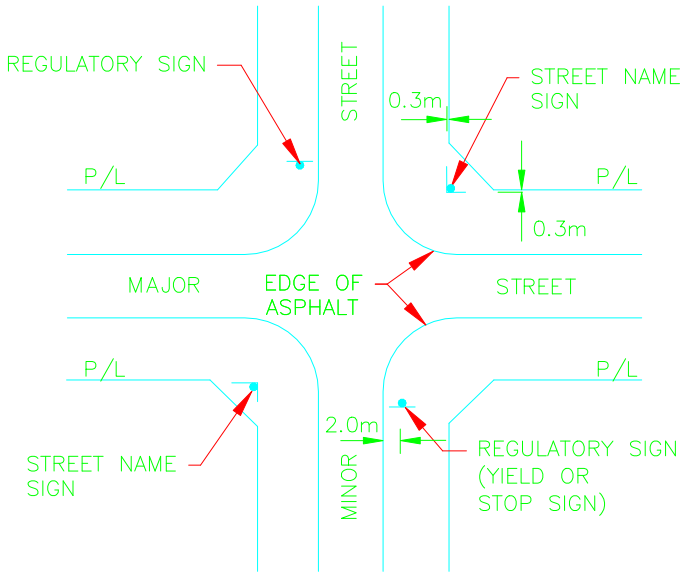
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

MUNICIPAL ADDRESS NUMBER SIGN LOCATION

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

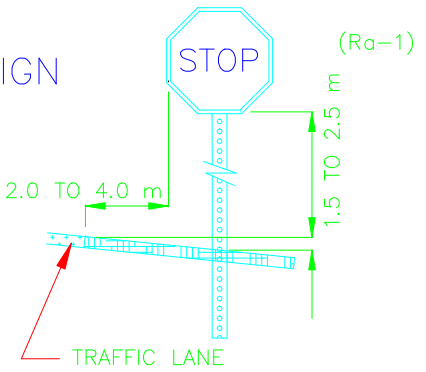
STD. No. 3.13-02



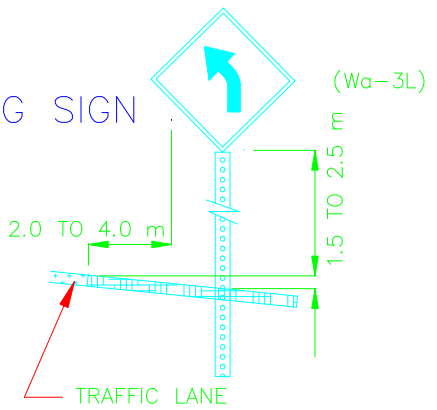
NOTE:
FOR CUL-DE-SACS, A "NO EXIT" SIGN SHALL BE PLACED ON THE OPPOSITE SIDE OF THE ROAD AS THE REGULATORY SIGN POST, WITH 2.0m OFFSET FROM EDGE OF PAVEMENT

NOTE:
ALL REGULATORY SIGNS ARE TO CONFORM WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL SIGNS ARE TO UTILIZE HIGH INTENSITY RETRO-REFLECTIVE MATERIAL.

STOP SIGN

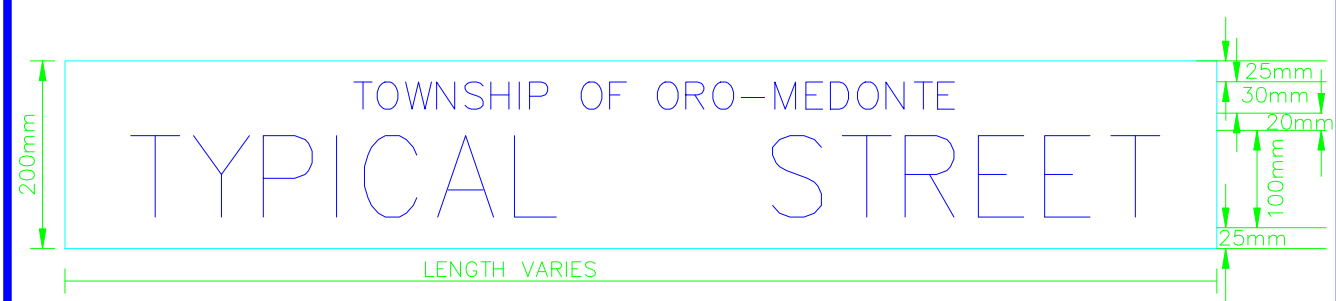


WARNING SIGN



TOWNSHIP OF ORO-MEDONTE

TYPICAL STREET



THE STREET NAME SIGN SHALL BE PAINTED GREEN WITH WHITE RETRO-REFLECTIVE LETTERING.

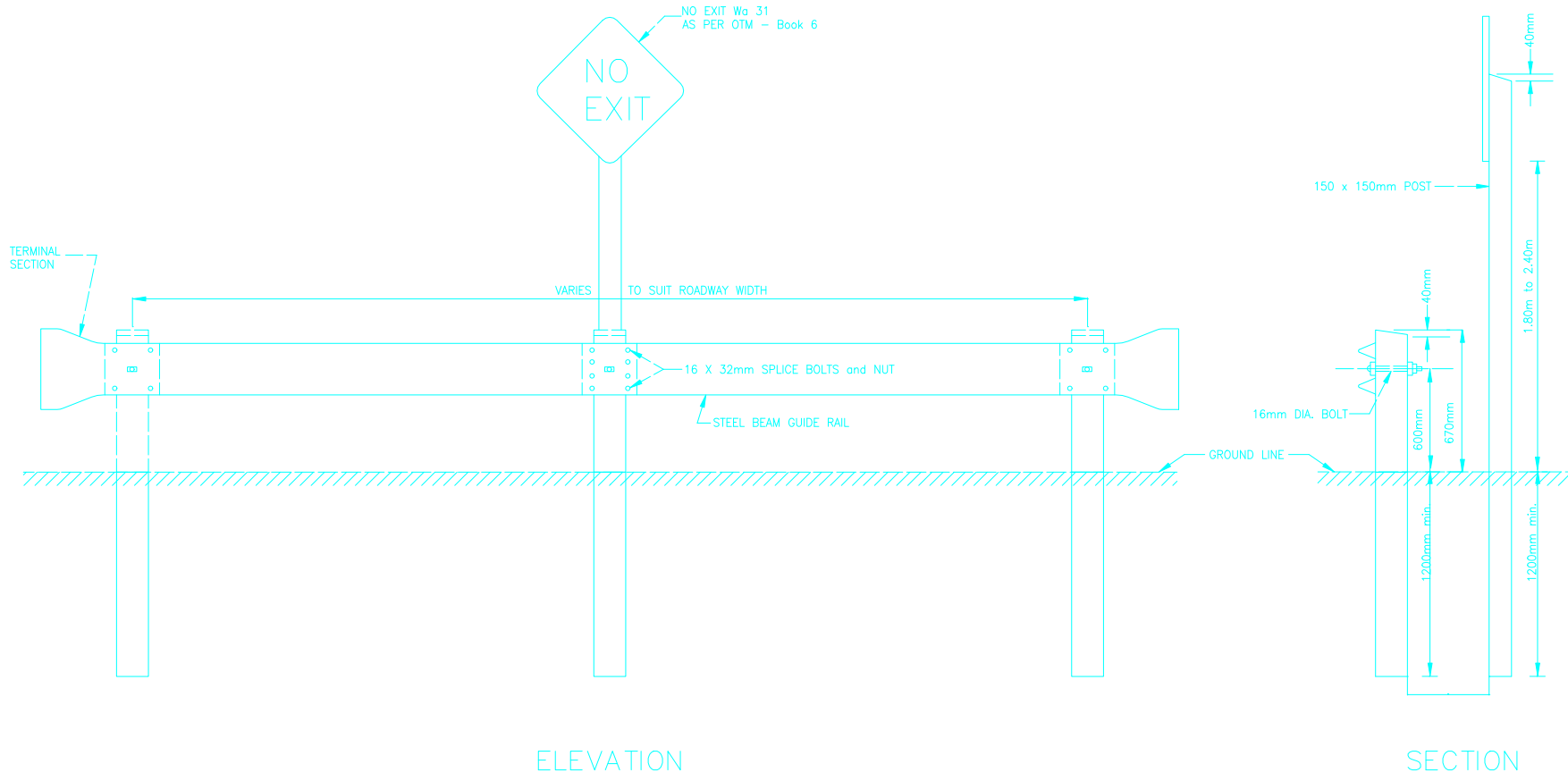
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

STANDARD STREET NAME AND REGULATORY SIGNS

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.13-03



ELEVATION

SECTION

DEAD END BARRICADE
PER OPSD 912.532

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

DEAD END BARRICADE

APR'D:
DRAWN:

DATE: 03 / 2016
SCALE: NTS

STD. No. 3.13–04

3.14 Sidewalks, Walkways, Trailways and Fences

3.14.1 Sidewalks

Sidewalks **may** be required in subdivision developments and **may** be also required where specified by the Director of Development Services as walkway links through parkland, and as connective links between cul-de-sacs and other points of pedestrian movement. Sidewalks shall be constructed in accordance with Township Standards.

Where the development generates the need, in the opinion of the Director of Development Services, sidewalks **may** be required on existing roads external to the plan or roads where reverse frontage is proposed.

Sidewalks shall be constructed as required within the plan for the proper circulation of pedestrian traffic and shall be in accordance with the most recent requirements and specifications of the Township of Oro-Medonte.

The Township requires that **all** concrete sidewalks be constructed as indicated on the approved Engineering Drawings, prior to the release of the first conditional or unconditional Occupancy Certificate in accordance with the Subdivision Agreement and no later than one (1) year after the completion of base course asphalt.

3.14.1.1 Location

Should sidewalks be required, the sidewalks shall be constructed on Township of Oro-Medonte roads as shown on the Township's Road Cross-Section(s) – Section 3.5

Placement of the sidewalk shall generally be in the following priority:

- North and east side of road to take advantage of the sun.
- Minimum driveway crossings.
- Reduced road crossings.
- Inner side of Road Elbows.
- Through the access easements on cul-de-sacs.
- Where practicable, on the same side as streetlights are located.

3.14.1.2 Specification

All sidewalks shall be of a Universal Barrier Free design throughout their length and at **all** intersections and crossings. The standard width for residential development is 1.5m. The sidewalk shall be constructed 25mm higher than the finished sod on the downstream side and flush to the finish sod on the upstream side.

Concrete strength used in sidewalks shall be 30 MPa concrete with 7.0% ± 1.5%, air entrainment. Concrete sidewalks shall normally be a minimum of 150mm thick, 150mm thick across residential driveways and 200mm thick across commercial or industrial driveways. Sidewalks shall comply with OPSD 310.010, 310.020, 310.030, 350.010, 351.010 and OPSS 351 on a 150mm compacted Granular "A" base.

Sidewalks shall not be constructed on organic soils. Sidewalk profile and cross fall shall be such that it does not interfere with the proposed drainage pattern.

3.14.2 Walkways and Trailways

The Developer may be required to design and construct a trail system or walkways and linkages to existing trail systems. Walkways shall be required adjacent to parkland, in general. Walkway easements adjoining parallel roads or acting as service access shall be fenced, gated, signed, and planted according to Township Standards. The provision of new trails shall support a Township wide trails network.

The Township's trails network shall generally be comprised of the following:

- multi-use urban trails, 3.0 m width (hard surface, multiple user);
- multi-use rural soft surface trails, 3.0 m width (crusher fines, multiple users);
- greenway trails, 2.0 m width (soft surface, 4-season multi-use trails);
- road-based active transportation routes.

- Proposed trails shall link together local points of interest, **all** open space amenities, civic institutions and connect to the regional trails network.
- To the extent possible the route shall utilize public open spaces, unopened road allowances / rights-of-way, blocks, and easements away from roadways.

- In the event trails are located along roadways additional right-of-way width may be required by the Township.
- Trails connecting through settlement areas located within the road right-of-way shall be paved multi-purpose cycle ways.
- Trails through sensitive natural features shall be designed as soft surface paths and located to avoid fragile areas.
- Entrance points to the trail system shall be marked with signage coordinated with the Township.

The minimum standard for the multi-use urban trail shall be:

- 3.0 m width of 50 mm HL3 asphalt;
- 200 mm Granular “A” base compacted to 95% SPDD.

3.14.3 Fences

Fences shall be constructed in accordance with the most recent requirements and specifications of the Township as shown on the standard drawings.

Fences are required:

- alongside yard flankage and/or rear yards backing onto roadways unless noise attenuation barriers are required
- along public walkways in accordance with Township Standards
- as designated by the Manager of Development Engineering
- noise attenuation fences per approved report

The minimum requirements for residential chain link fence heights are in accordance with the following:

Adjacent Land Use	**Fence Height (m)**
Parklands/Woodlands	1.2
Public Walkways	1.2 in front of dwellings 1.8 between dwellings and rear yards
Pools	As per Township Pool By-law
Abutting Agricultural Lands	1.5 - 10 strand, galvanized ‘farm fence’ with strand spacing of 0.15m hor. and 0.30 ver.

Note: All Chain Link Fence shall be Galvanized

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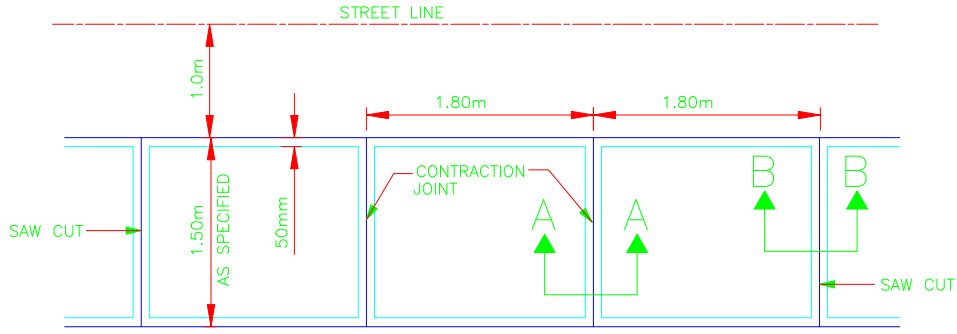
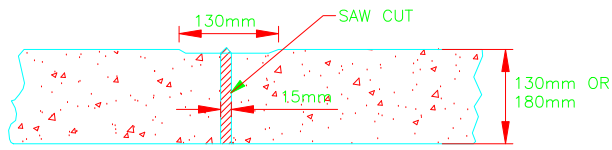
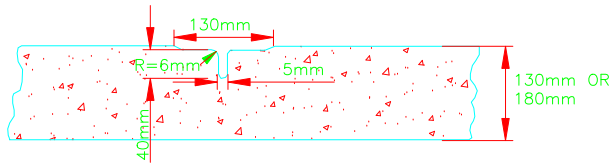


PLAN VIEW

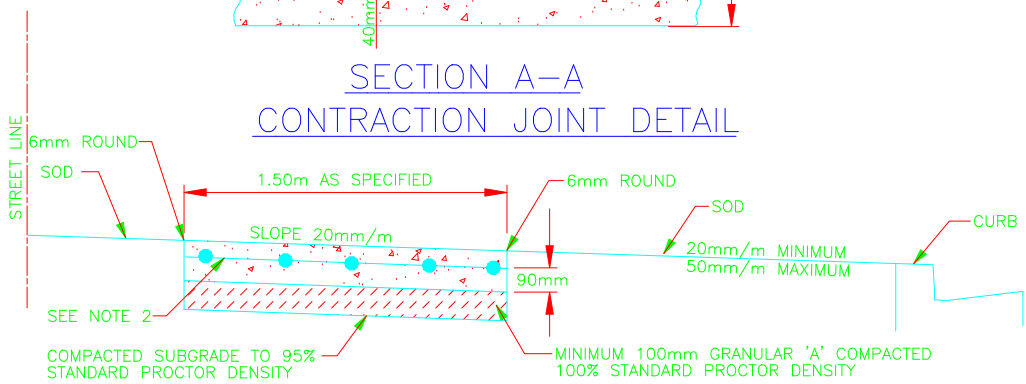
LONGITUDINAL SECTION



SECTION B–B
SAW CUT JOINT DETAIL



SECTION A–A
CONTRACTION JOINT DETAIL



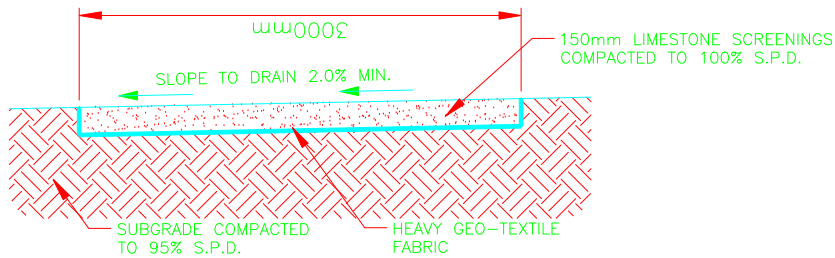
BOULEVARD SECTION

NOTES:

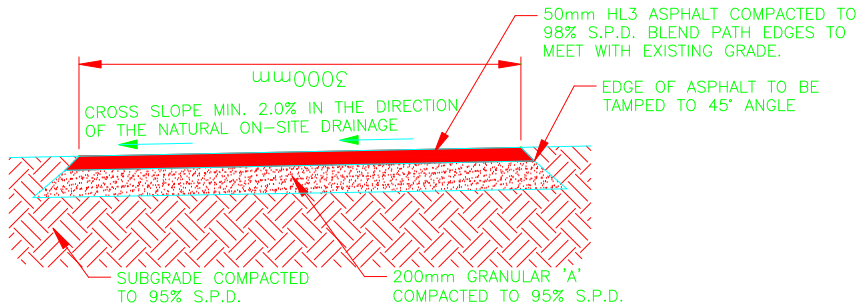
1. CONCRETE TO BE 25 MPa, 5–7% AIR ENTRAINMENT WITH 20mm MAXIMUM AGGREGATE SIZE.
2. FOR COMMERCIAL, INDUSTRIAL AND APARTMENT DRIVEWAYS, SIDEWALK TO BE REINFORCED WITH 152mm x 152mm MW 18.7 METRIC WELDED WIRE MESH.
3. SAW CUT JOINTS ARE ALSO REQUIRED WHERE SIDEWALK ABUTS OTHER CONCRETE STRUCTURES, WALKS, CURBS, UTILITY POLES, HYDRANTS, MAINTENANCE HOLES AND AT CERTAIN LOCATIONS AT DISCRETION OF THE TOWNSHIP OF ORO–MEDONTE.
4. CONTRACTION JOINTS TO BE FORMED AFTER THE CONCRETE HAS RECEIVED ITS INITIAL SET.
5. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE		APR'D:	DATE: 03 / 2016
		DRAWN:	SCALE: NTS
CONCRETE SIDEWALK		STD. No. 3.14–01	



LIMESTONE WALKWAYS



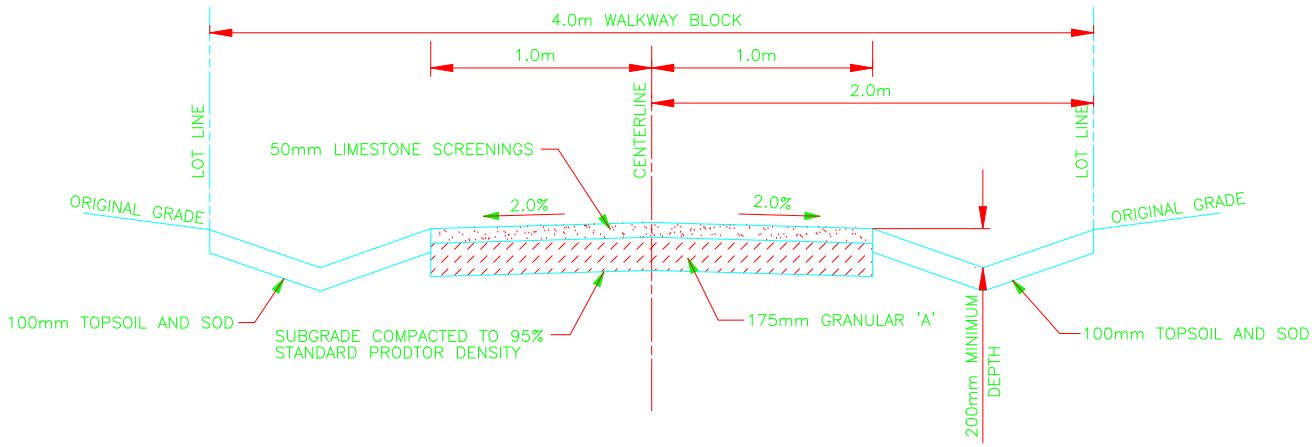
ASPHALT WALKWAYS

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. EXTEND GRANULAR 'A' TO ANGLE OF REPOSE, APPROX. 200mm BEYOND EDGE OF PAVED SURFACE.
3. ENSURE POSITIVE DRAINAGE ON ASPHALT PATHWAY.
4. SURFACE WATER MUST NOT BE COLLECTED ON PATHWAY. POSITIVE DRAINAGE FROM PATHWAY MUST BE GENERATED AND INTEGRATED INTO OVERALL DRAINAGE PLAN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
PEDESTRIAN WALKWAYS - ASPHALT & LIMESTONE	STD. No. 3.14-02	

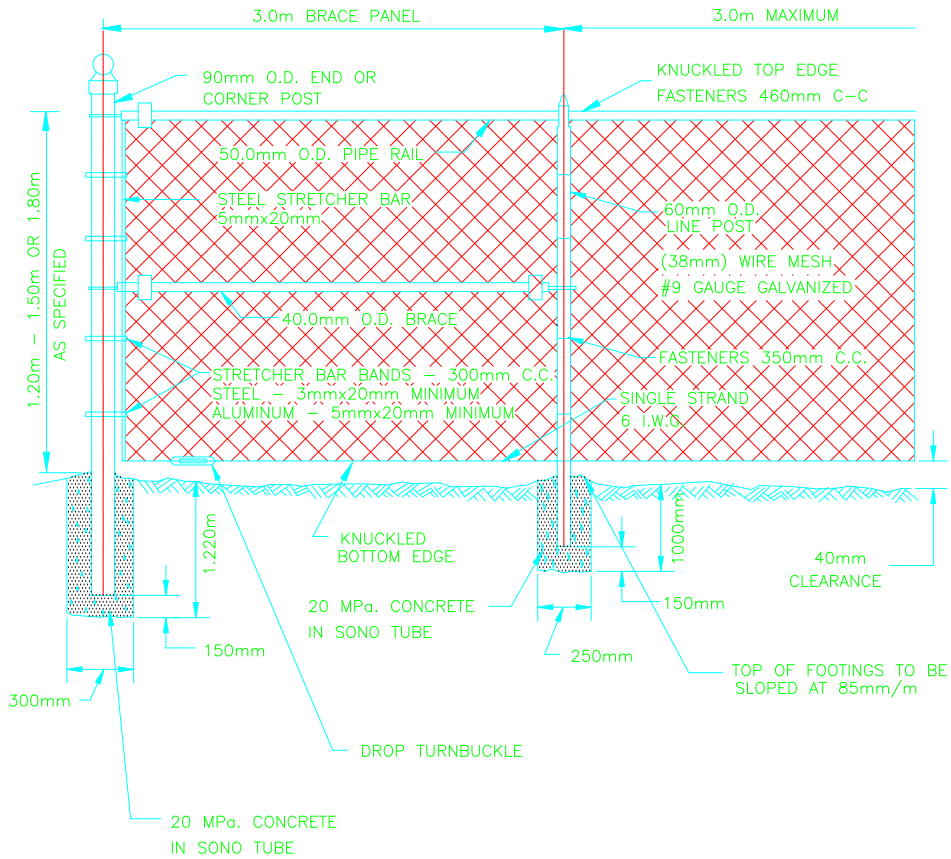


NOTES:

1. ALL GRANULAR MATERIALS TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
2. PROPOSED LONGITUDIAL GRADE OF WALKWAY TO BE IDENTIFIED ON ENGINEERING DRAWINGS. MINIMUM LONGITUDINAL GRADE TO BE 1.5%.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
PEDESTRIAN WALKWAY – GRANULAR	STD. No. 3.14-03	



NOTES:

1. LENGTH OF POSTS

FENCE POST LOCATION	1.20m FENCE	1.50m FENCE	1.80m FENCE
END, CORNER OR RESTAINING	2.30m	2.60m	2.90m
LINE POST	2.05m	2.36m	2.65m

2. FASTENERS – 6 I.W.G. GALVANIZED STEEL OR ALUMINUM WIRE.
3. ALL POSTS, PIPE RAILS AND FASTENERS TO BE GALVANIZED.
4. BRACE RAILS TO BE ELIMINATED ON 1.20m HIGH FENCE.
5. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS.
6. FENCE FABRIC SHALL BE TYPE 1 STEEL FABRIC 3.0mm DIA. STEEL WIRE, STYLE 3 LIGHT STEEL WIRE, GALVANIZED BEFORE WEAVING.
7. FENCING REQUIREMENTS FOR PUBLIC WALKWAYS ARE TO BE RANGE FROM 1.2m TO 1.8m. A FENCE HEIGHT OF 1.2m IS TO BE SPECIFIED BETWEEN STREETLINE AND THE FRONT OF THE DWELLING. FENCING HEIGHTS BEYOND THE FRONT OF THE DWELLING ARE TO 1.8m.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:

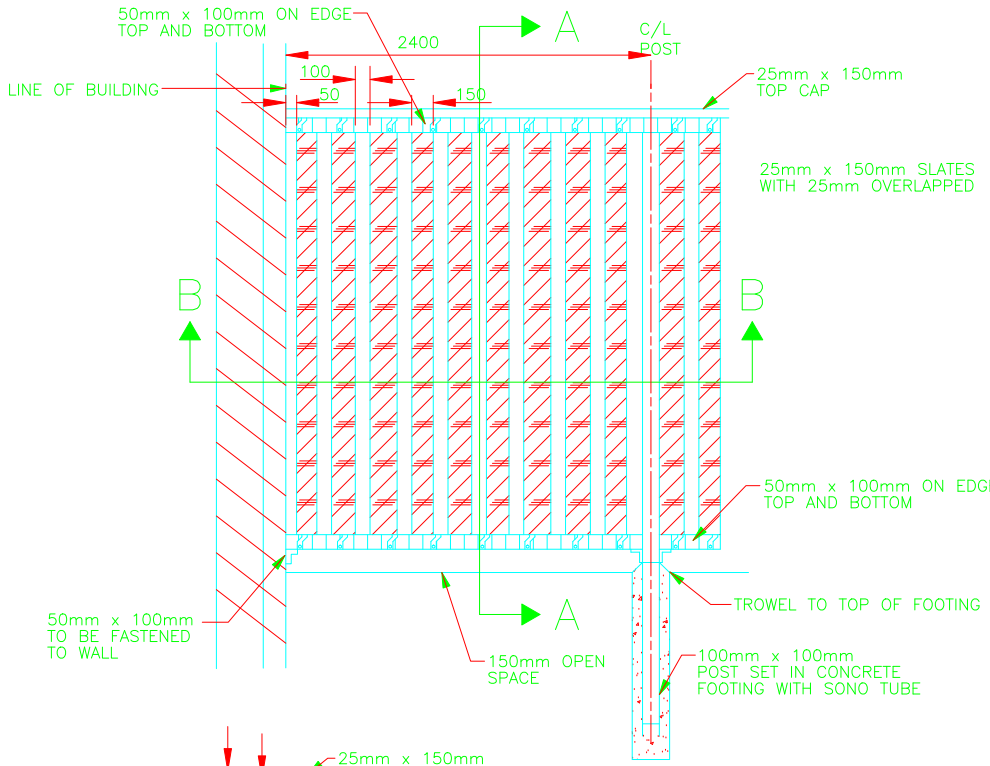
DATE: 03 / 2016

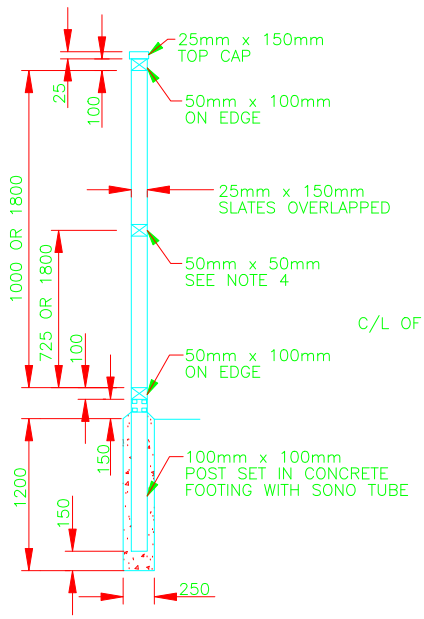
DRAWN:

SCALE: NTS

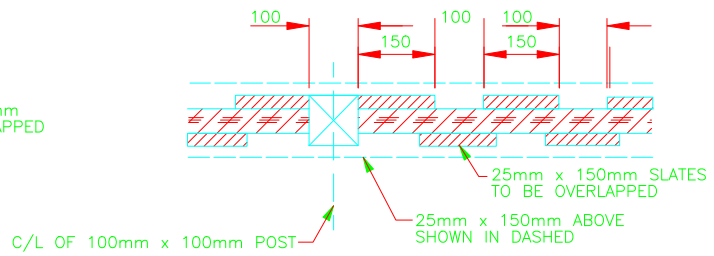
CHAIN LINK SECURITY FENCE

STD. No. 3.14–04





SECTION A–A



SECTION B–B

NOTES:

1. USE CONSTRUCTION GRADE CEDAR OR PRESSURE TREATED. DO NOT USE SPRUCE OR HEMLOCK.
2. USE APPROVED WOOD STAIN.
3. USE STEEL ZINC COATED TWISTED NAILS No. 11 GUAGE 64mm x 76mm.
4. FOR FENCE 1.8m OR HIGHER 50mm x 50mm MUST BE USED AS SHOWN IN SECTION A–A.
5. USE GALVANIZED FENCE BRACKETS.
6. FOR WALKWAYS, THE FENCE HEIGHT SHOULD BE 1.2m HIGH BETWEEN STREETLINE AND FRONT WALL OF DWELLINGS ON ADJACENT LOTS AND 1.8m FOR THE REMAINDER.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:

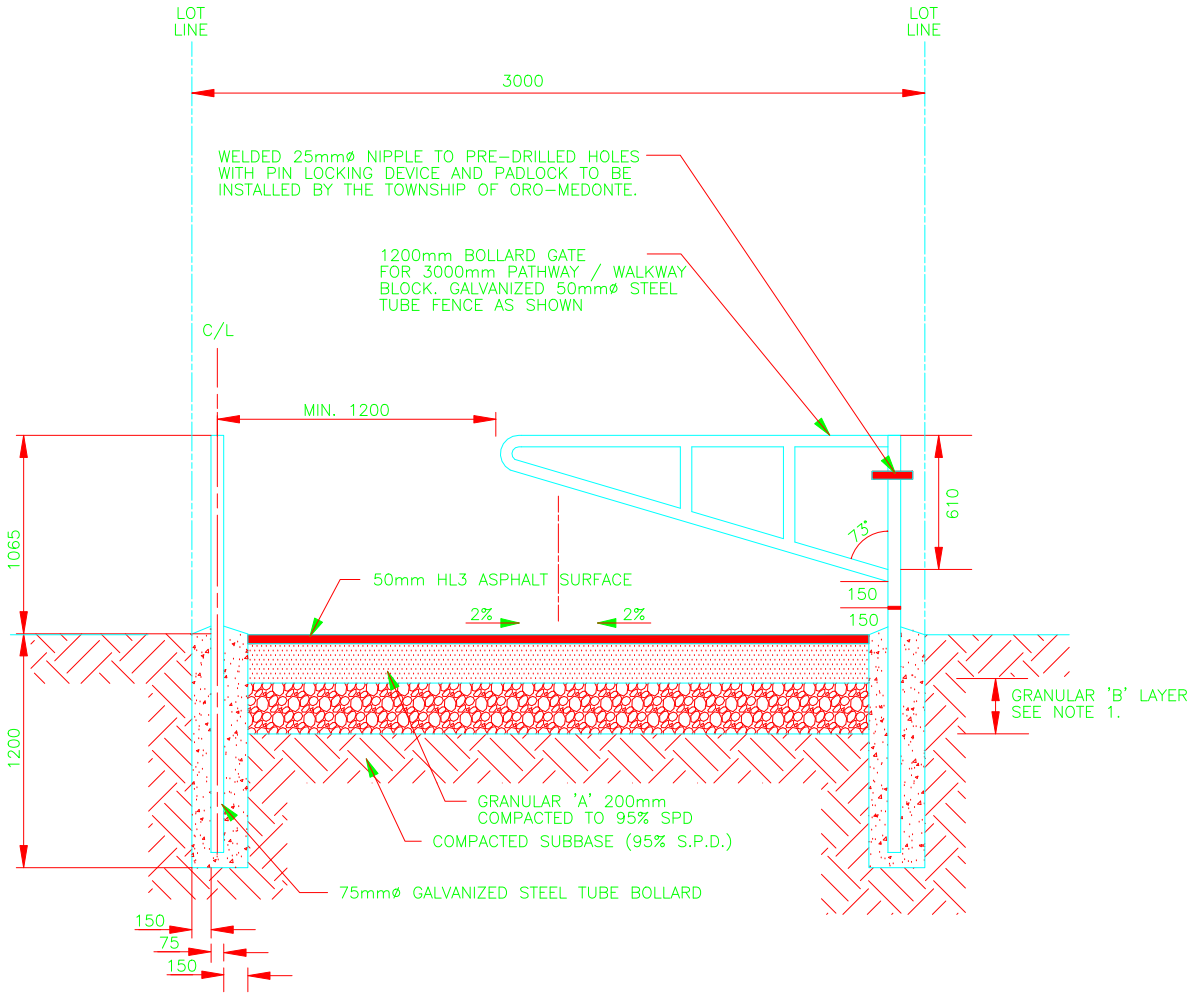
DATE: 03 / 2016

DRAWN:

SCALE: NTS

WOOD PRIVACY FENCE

STD. No. 3.14–05



NOTES:

1. 200mm GRANULAR 'B' COMPACTED TO 100% S.P.D. TO BE PROVIDED ONLY WHEN MAINTENANCE OR EMERGENCY VEHICLE ACCESS.
2. 100mm GATE SLEEVE RESTS ON 75mmø GALVANIZED POST.
3. ADD SPURS (LAGS) TO BOTH GALVANIZED POLES TO PREVENT THE TUBING FROM TURNING IN THE CONCRETE FOOTING.
4. FOR 6.0m EMERGENCY ACCESS / WALKWAY TWO (2) STANDARD BOLLARD GATES ARE REQUIRED.
5. ALL SWING GATES TO BE INSTALLED ON RIGHT-HAND SIDE AT ENTRY AND AT LEAST 2500mm IN FROM SIDEWALK EDGE OR 6000mm IN FROM CURB EDGE.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

VEHICLE ACCESS / PEDESTRIAN WALKWAY GATE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.14-06

3.15 Easements and Blocks

3.15.1 General Requirements

The Township shall require conveyance of easements or dedication of blocks, without consideration, free and clear of **all** liens and encumbrances and shall not be part of parkland dedication calculations, to the minimum width requirements, or greater as determined by the Director of Development Services.

All construction and maintenance shall be done in a safe expedient manner with restoration to be in keeping with the adjacent land use. Under normal conditions, notice shall be given to the owner of the land indicating nature and duration of the construction and/or maintenance.

Unless otherwise stipulated, an easement or block shall be granted to The Corporation of the Township of Oro-Medonte by a proper legally registered document being sufficiently prepared and the easement or block being particularly described to allow registration in the Land Registry Office for the County of Simcoe. In the case of easement, the document shall define the reasons for extending the grant-of-easement.

Easements or Blocks of land **shall not** be considered as part of parkland dedication requirements as required by the Planning Act.

3.15.2 Easement Width Requirements

Subject to specific conditions required by the Township, the width of an easement shall be a minimum of 6.0m or twice the depth of the pipe at its deepest point, whichever is greatest. Additional easement widths may be required depending on the critical depth of swales proposed.

- Easements for **underground services** shall be located on one side of the common lot line between adjacent lots and **shall not** straddle common lot lines.
- **Rear and side yard swale** easements designed to convey external or Township drainage **shall be** centered over the common lot line between adjacent lots.
- Buildings, including footings or building extensions, **shall not** encroach the limits of Township easements.

3.15.3 Block Conveyances

Block Conveyances may be required for, but not limited to the following reasons:

- Rear and side yard piped storm drainage systems, including catch basins, French drains, maintenance holes and other appurtenances.
- Storm sewers, watermain and sanitary sewers (other than private connections).
- Where underground services are required beyond the limits of a subdivision or site plan.
- **All** overland flow routes, open channels, and defined drainage systems accommodating a major storm.
- Walkways and bicycle paths.
- Valleys, streams, open channels, watercourses (whether flowing or intermittent), seepage areas, wetlands, natural bodies of water and floodplain lands identified by the Township as being environmentally significant requiring protection or designated as hazard or open space lands.
- Stormwater management facilities, including, but not limited to: detention/retention ponds, Low Impact Development (LID) features, infiltration facilities which are to be owned and operated by the Township.
- Fire and Emergency Services access to road sections, parklands, recreational areas, etc.

3.15.4 Block Width Requirements

Blocks of land shall be of sufficient dimension to accommodate the proposed facility, access from a public right-of-way and maintenance requirements.

The minimum width of blocks of land for open drainage channels shall be the width of the top of open channel plus 7.5 m along one side of the channel for maintenance requirements.

Valley lands (crest of slope to crest of slope) may be contained within blocks of land to be conveyed to the Township, as a condition of development. Blocks in this case shall include 3.0 m platform widths at the top of slope and on both sides.

3.15.4.1 Storm and Sanitary Sewer Mains

The minimum width of blocks for storm and sanitary sewers shall be in accordance with the following:

Size of Pipe	Depth of Invert	Minimum Width of Block
250 to 375 mm	3.0 m maximum	6.0 m
450 to 675 mm	3.0 m maximum	6.0 m
750 to 1500 mm	3.0 m maximum	6.0 m
1650 mm and up	4.0 m maximum	4.0 m plus 3 times O.D. of pipe

Where two pipes are to be located on one block, the minimum width of block shall be the width of block required for the larger of the two pipes plus 1/2 the width of block for the smaller pipe, rounded to the next 1.0 m increment. Additional block width may be required to ensure adequate separation between the two pipes and a minimum separation of 3.0 metres between the block limit and the nearest pipe.

3.15.4.2 Storm Connections for Rear Yard Catch Basins

The minimum width of blocks for leads to rear yard catch basins shall be 5.0 m for pipe sizes ranging from 250 mm to 450 mm in diameter. For pipe sizes greater than 450 mm, the above criteria shall apply. The lead shall be centred on the block.

3.15.4.3 Watermain

The minimum width of blocks for watermain shall be in accordance with the following:

Size of Pipe	Depth of Invert	Minimum Width of Block
Up to 600 mm	3.7 m maximum	6.0 m
675 mm and up	3.7 m maximum	9.0 m

3.15.4.4 Fire and Emergency Services

- The minimum width of Blocks for Fire and Emergency Services shall be 6.0m. with 12.0m centre line turning radii as required.
- The Block shall be graded and hard surfaced sufficient to allow for year-round access and maintenance of Fire and Emergency Services vehicles.
- The Block shall be fenced for its full length with no encumbrances.

- Constructed in conformance with 3.5.10 Cul-De-Sacs (Std. Dwg. 3.5-04)

3.15.5 Grading Plans for Blocks

Shall be drawn to a scale of 1 to 500 or larger showing existing contours established from field elevations.

The grading plans shall indicate but not be limited to the following:

- existing contours and elevations within the plan and at a minimum distance externally far enough to determine the existing drainage pattern. In addition to the above, grading plans for parks are to indicate existing contours at 0.5m intervals along with **all** existing trees, structures, watercourses, etc.
- proposed contours for grading within large blocks and parks
- any other points necessary to give proper picture of the proposed drainage scheme including tops of catchbasins, bottoms of swales and top and bottom of retaining walls
- percent road grades for **all** roads within the development and the distance of the particular grade shall also be included.
- overland flow routes.
- easements including dimensions and descriptions
- fencing and retaining walls
- drainage types in accordance with typical details
- cut off swales and catchbasins to intercept interim block drainage and external drainage
- areas of engineered fill
- proposed driveway entrances, streetlight poles, hydro transformers, underground utility vaults, CATV and Bell pedestals, fire hydrants and valves.

3.16 Landscaping / Streetscaping

3.16.1 General Requirements

The developer is required to prepare Landscape and Streetscape Plans, prepared by a qualified Landscape Architect, to be approved by the Township on a site by site basis.

Due to varying Lot Configurations, the planting design shall address the many variations in lot configurations. The required spacing of trees and minimum setbacks allows that **most** lots shall have two (2) trees, some **may** only have one (1) and some **may** have none.

In general, at least two trees shall be planted in front of each single-family dwelling, semi-detached unit, and townhouse block. A minimum of two (2) trees shall be placed along the flankage side of each corner lot.

Trees shall be placed so that its mature form shall **not** conflict with other essential services and functions.

Because the presence of utilities, community mail boxes and the curb can interfere with the preferred placement of street trees, the street tree planting scheme shall be flexible enough to accommodate on-site adjustments.

Detailed Cost Estimates shall be required for **all** approved Landscape / Streetscape Plans. This estimate shall be used for security purposes.

All plans shall be consistent with the Township of Oro-Medonte Development Engineering Policies, Process and Design Standards and shall require Township approval prior to implementation.

3.16.2 Tree Planting Requirements

Once driveways, utilities and light standards have been installed, the exact location of street trees shall be determined on site by the Landscape Architect and approved by the Township prior to planting.

The Developer is responsible to plant trees on each lot, 2.0 m from property lines and abutting the development, in accordance with the specifications established pursuant to the Subdivision Agreement. No trees/plantings are to be located on Township road allowances. Should an exception be requested, the location and type(s) shall be confirmed with the Township.

Minimum clearances for Street Trees:

- 2.0m from the backside of the curb
- 3.0m from water hydrants
- 3.0m from driveways
- 3.0m from neighbourhood mailboxes
- 3.0m from fences
- 3.0m from hydro transformers
- 5.0m from streetlight poles
- Behind the daylight triangle as per Section 3.10 and / or the Geometric Design for Ontario Highways
- 18.0m from face of **all** warning and regulatory signs

3.16.3 Timing of Landscape / Streetscape Planting Works

All trees shall be placed during either the spring or fall dormant season in unfrozen soil.

3.16.4 Quality and Source

All boulevard trees shall be #1 quality nursery grown stock, 2.25 m. to 4.0 m. in height with a minimum trunk diameter of 50 mm. measured at a minimum of 1.0 m. above ground level. **All** trees shall be free from physical damage, insects, pests, and diseases and shall have at least three quarters of the root system intact.

3.16.5 Landscape Plans

The Landscape Plans shall be prepared by a qualified Landscape Architect.

The Landscape Plans shall be drawn and stamped by a Full Member of the Ontario Association of Landscape Architects.

All Landscape Plans shall be drawn at a minimum scale of 1:500.
Landscape Plans shall show **all** landscaping details as required by the Site Plan Agreement. A schedule of plant species and sizes shall be identified on Landscape Plans.

All maintenance holes, catch basins, hydrants, valves, streetlights, and other servicing features that appear above grade shall also be shown on the Landscape Plans.
The Landscape Plans shall include but not limited to the following drawings:

- Existing Natural Features Assessment;
- Tree Survey/Vegetation Analysis;
- Tree Preservation Plan and Details;
- Streetscape and Buffer Planting Plans and Details;
- Detailed Parkland Development Plans and Details;
- Trails Development and Details;
- Landscaping Restoration Details;
- Stormwater Management Facility Planting Plan;
- Lighting Plans;
- Planting Plans.

The Developer may request jointly obtaining a Landscape Architect with the Township (**all** costs are to be borne by the Developer).

3.16.6 Streetscape Plan

The Streetscape Plan shall show the following:

- existing trees and natural features to remain;
- building envelopes, driveways, and sidewalks;
- walkways, trails, and easements;
- required fencing including privacy, acoustic and chain link;
- proposed plantings;
- location of streetlighting;
- location of public utility boxes and easements and hydrants;
- heights of existing and proposed retaining walls, fences etc.

Planting / Construction details shall be required for **all** landscape elements to be implemented as part of the development.

All Landscape / Streetscape and Stormwater Management Facility Planting Plans shall require Township approval prior to implementation of the plans.

Developers are required to display approved Landscape plans at the sales pavilions for the homebuilders in any new subdivision.

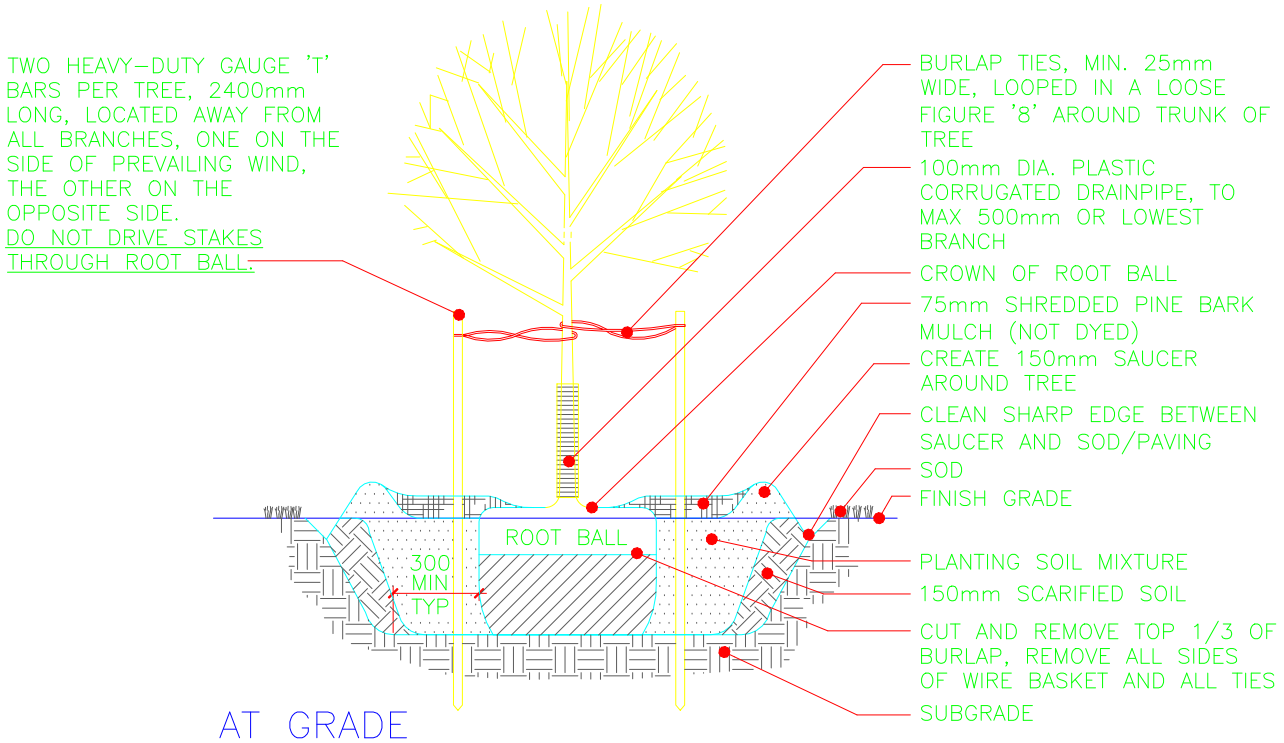
The following notes pertaining to layout requirements and are to be included on **all** Landscape / Streetscape and Naturalization Submission Drawings:

NOTE 1: Depicted on this plan are the species and the approximate location of street trees. Once driveways, utilities and light standards have been installed, the exact location of street trees shall be staked on site by the Landscape Architect and approved by the Township prior to planting.

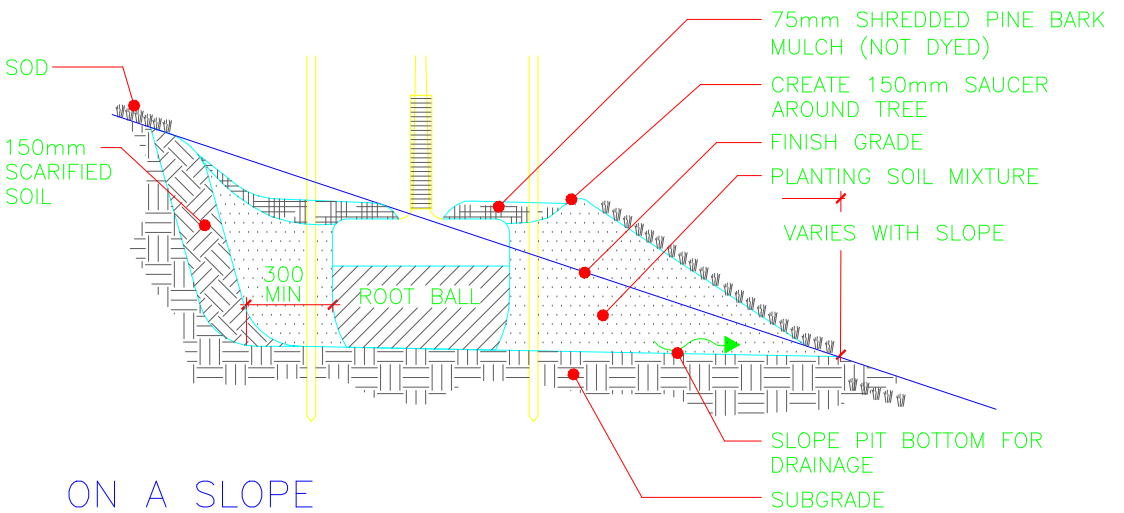
NOTE 2: The tree pits and planting beds for **all** trees and shrubs located within 2.0 m of underground utilities are to be hand dug.

NOTE 3: All plant material shall conform to the Canadian Standards for Nursery Stock and shall be guaranteed until Final Acceptance and Assumption of the subdivision works by the Township.

NOTE 4: All plantings and hard landscape features are to be staked out on site and approved by the Landscape Architect and Township prior to installation. Any deviations from the approved Landscape Plan(s) require Township approval.



AT GRADE



ON A SLOPE

NOTES

1. DO NOT ALLOW AIR POCKETS WHEN BACKFILLING.
2. POSITION CROWN OF ROOT BALL 50mm ABOVE FINISH GRADE TO ALLOW FOR SETTLING.
3. DO CORRECTIVE PRUNING TO RETAIN NATURAL FORM OF TREE AS DIRECTED BY THE LANDSCAPE ARCHITECT.
4. FOR TREES PLANTED WITHIN PLANTING OR SHRUB BEDS, DELETE SAUCER AROUND BASE OF TREE.
5. ALL DIMENSIONS ARE IN MILLIMETRES.
6. NO TREE PITS SHALL BE LEFT OPEN OVERNIGHT.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

DECIDUOUS TREE PLANTING

STD. No. 3.16–01

NOTES

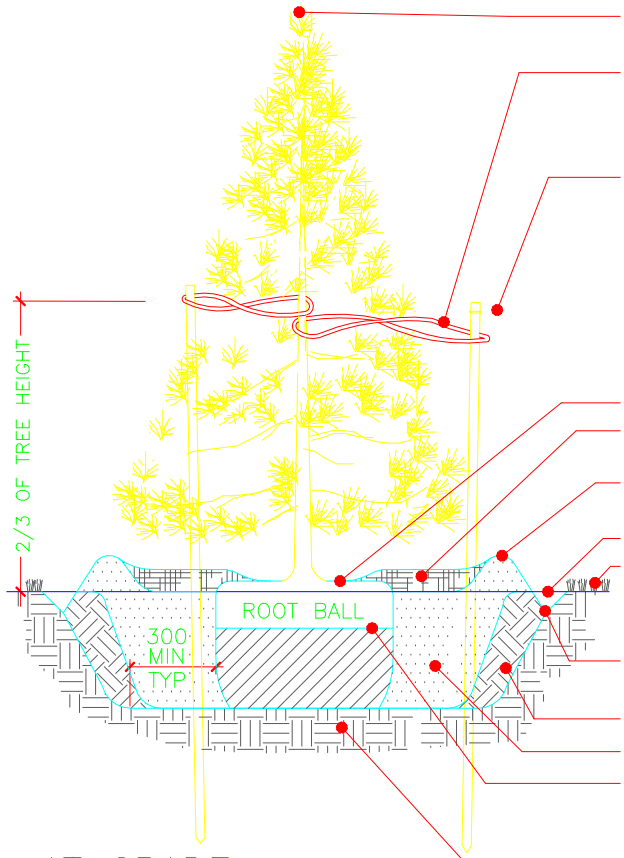
1. DO NOT ALLOW AIR POCKETS WHEN BACKFILLING.

2. POSITION CROWN OF ROOT BALL 50mm ABOVE FINISH GRADE TO ALLOW FOR SETTLING.

3. FOR TREES PLANTED WITHIN PLANTING OR SHRUB BEDS, DELETE SAUCER AROUND BASE OF TREE.

4. ALL DIMENSIONS IN MILLIMETRES.

5. NO TREE PITS SHALL BE LEFT OPEN OVERNIGHT.



DO NOT DAMAGE OR CUT LEADER BRANCH

BURLAP TIES, MIN. 25mm WIDE, LOOPED IN A LOOSE FIGURE '8' AROUND TRUNK OF TREE

TWO HEAVY-DUTY GAUGE 'T' BARS PER TREE, 2400mm LONG, CLEAR OF ALL BRANCHES, ONE ON THE SIDE OF PREVAILING WIND, THE OTHER ON THE OPPOSITE SIDE. DO NOT DRIVE STAKES THROUGH ROOT BALL.

CROWN OF ROOT BALL

75mm SHREDDED PINE BARK MULCH (NOT DYED)

CREATE 150mm SAUCER AROUND TREE

FINISH GRADE

SOD

CLEAN SHARP EDGE BETWEEN EDGE OF SAUCER AND SOD

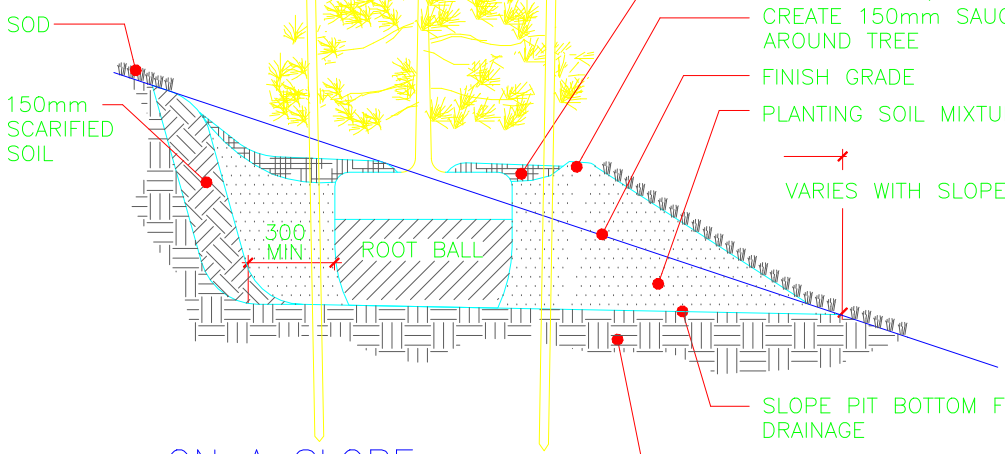
150mm SCARIFIED SOIL

PLANTING SOIL MIXTURE

CUT AND REMOVE 1/3 OF BURLAP. REMOVE ALL SIDES OF WIRE BASKET AND ALL TIES

SUBGRADE

AT GRADE



75mm SHREDDED PINE BARK MULCH (NOT DYED)

CREATE 150mm SAUCER AROUND TREE

FINISH GRADE

PLANTING SOIL MIXTURE

VARIES WITH SLOPE

SLOPE PIT BOTTOM FOR DRAINAGE

SUBGRADE

ON A SLOPE

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

APR'D:

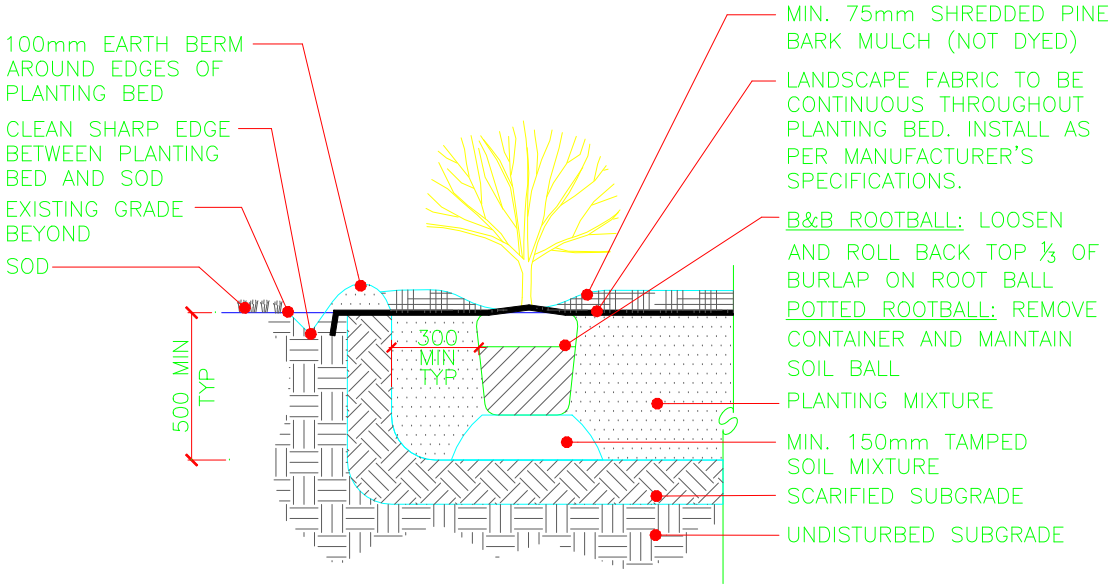
DRAWN:

DATE: 03 / 2016

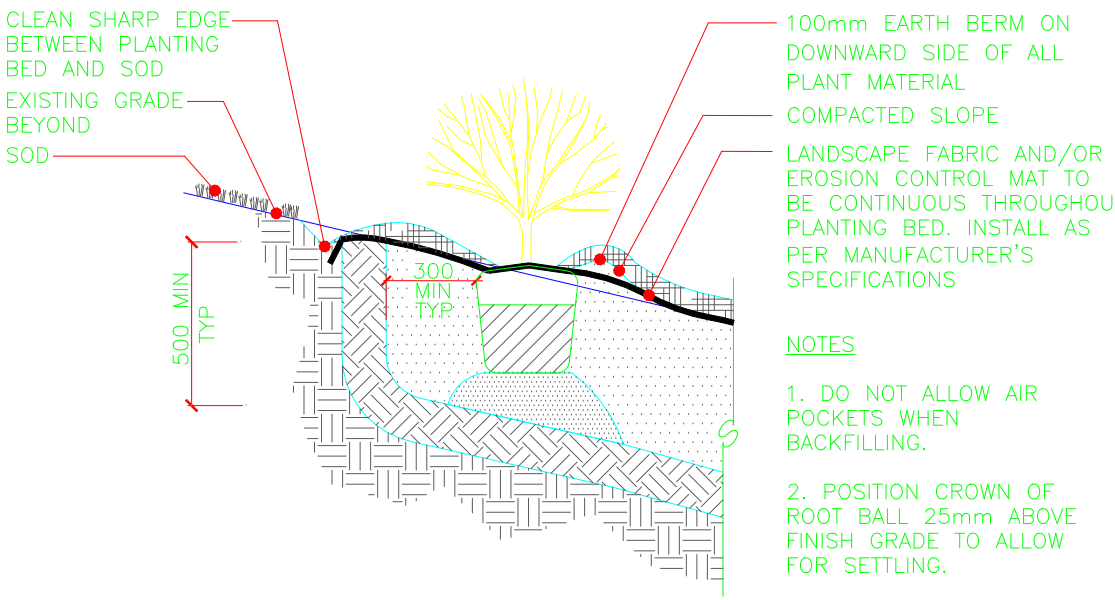
SCALE: NTS

CONIFEROUS TREE PLANTING

STD. No. 3.16-02



TYPICAL SHRUB PLANTING



PLANTING ON 3:1 SLOPE DETAIL

NOTES

1. DO NOT ALLOW AIR POCKETS WHEN BACKFILLING.

2. POSITION CROWN OF ROOT BALL 25mm ABOVE FINISH GRADE TO ALLOW FOR SETTLING.

3. ALL DIMENSIONS IN MILLIMETRES.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
SHRUB PLANTING	STD. No. 3.16-03	

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3.17 Parkland Development

The Parkland Development Plan shall be approved by the Director of Operations and Community Services prior to construction of works within the Parklands.

Final Acceptance and Assumption of **all** Parkland shall be signed-off by the Director of Operations and Community Services prior to Assumption

3.17.1 Services

The Developer shall provide to the satisfaction of the Township, a water service connection, sanitary sewer lateral connection and storm sewer lateral connection to the street line for the park, if required by the Township. Metering requirements for water service connections shall be confirmed with the Township.

Where required by the Township, underground primary or secondary electrical cables shall be placed from the road allowance to designated locations within parkland.

3.17.2 Grading

- Parkland shall be fine graded in accordance with the approved grading plan.
- Care shall be taken to avoid damage to trees or features that are to remain.
- **All** graded areas shall be covered with a minimum of 150 mm of screened topsoil and shall be seeded and fertilized in accordance with the specifications of the Parkland Development Plan.
- **All** topsoil stripped from parklands shall remain on-site and not removed or sold. **All** park blocks less than 0.4 ha. shall be sodded on 150 mm of topsoil.
- **All** stones and debris shall be removed and disposed of by the Developer prior to the seeding or sodding of a park.
- The Developer shall provide chain link fencing along park boundaries or walkways as required by the Township.
- Building materials or equipment or debris shall not be stored on Parkland
- Stripped topsoil from other areas of the development shall not be stockpiled on Parkland.

3.17.3 Timing of Construction

All park blocks shall be graded and seeded or sodded within one year of the completion of the base course asphalt road construction in the area adjacent to the park. Seeding shall be carried out during the desirable months for seeding of May or September. Boulevard grading and sodding on road allowances adjacent to parklands shall be completed at the same time as the park seeding.

3.17.4 Maintenance

The Developer shall be responsible for the maintenance, watering, fertilizing, and mowing of the parklands to Township Standards until Final Acceptance and Assumption.

3.17.5 Parkland Development Plan Drawings

The Developer shall be responsible to prepare a detailed Parkland Development Plan for approval by the Township, for **all** lands to be dedicated for park purposes.

This plan shall show **all** existing trees and features that are in conformity with the end use of the park and that are to remain. **All** other trees shall be removed by the Developer subject to Township approval.

Prior to preparing the Parkland Development Plan(s), the Developer shall meet with the Director of Operations and Community Services and other Township staff as required to review Township recreational needs, i.e. soccer pitches, ball diamonds, playground equipment, benches, gardens, signage, etc.

The Parkland Development Plan **may** require greater detail beyond a grading and utilities servicing plan, depending on the size and complexity of the Parkland Development.

The Parkland Development Plan shall be prepared at a scale of 1:500 and form part of the approved Engineering Drawings, indicating the following, at a minimum:

- existing contours at maximum 0.5 m intervals
- drainage structures and direction of overland drainage

- species and size of existing plant material to remain and be protected
- species and size of plant material to be removed
- proposed underground services
- layout of **all** proposed recreation facilities
- layout of parking lot and spaces (including handicapped parking)
- layout of **all** trails
- proposed site amenities including benches, bike racks, trash receptacles, signs, washrooms, playground equipment
- perimeter fencing
- park lighting
- **all** surface treatments
- **all** proposed plant materials

The Developer may be required to design and construct some or **all** of the items identified in the Parkland Development Plan.

A Parkland Development Plan Cost Estimate based on estimated quantities with corresponding unit prices is required along with the Parkland Development Plan drawing submission.

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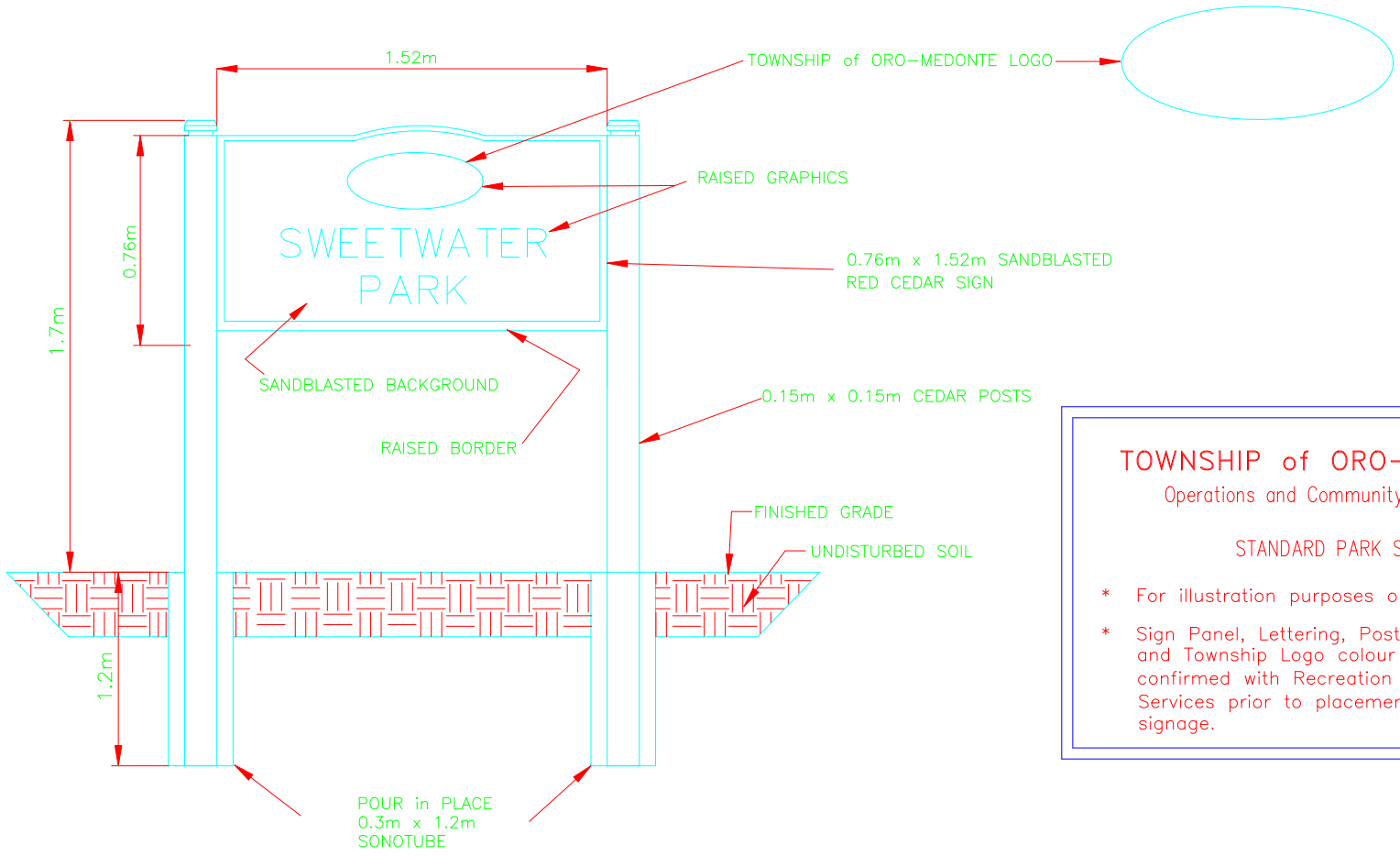


TOWNSHIP of ORO-MEDONTE

Operations and Community Services

STANDARD PARK SIGN

* For illustration purposes only.
* Sign Panel, Lettering, Post Colours and Township Logo colour scheme to be confirmed with Recreation and Community Services prior to placement of any Park signage.

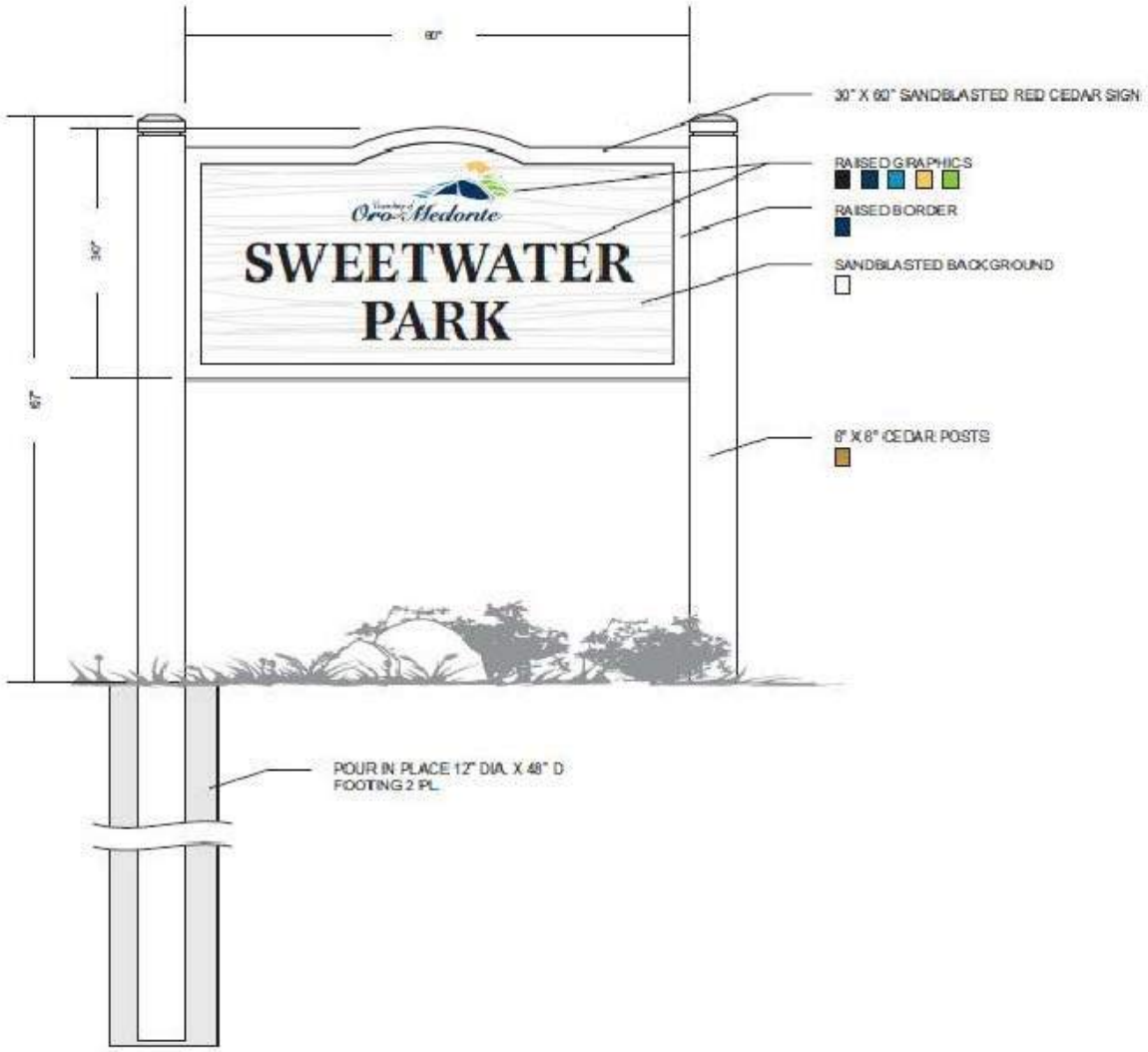
NO.	REVISION	APR'D	DATE
1	Operations and Community Services		05/23

TOWNSHIP OF ORO-MEDONTE

STANDARD PARK SIGN

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

STD. No. 3.17-01



LOGO COLOURS

Township of Oro-Medonte
Proud Heritage, Exciting Future

SIGN PANEL AND POSTING COLOURS

- SIKKENS CETOL 2/3 PLUS 078 NATURAL
- B. M. Cc10 ULTRA WHITE
- B. M. 2060-10 SYMPHONY BLUE
- B. M. BLACK

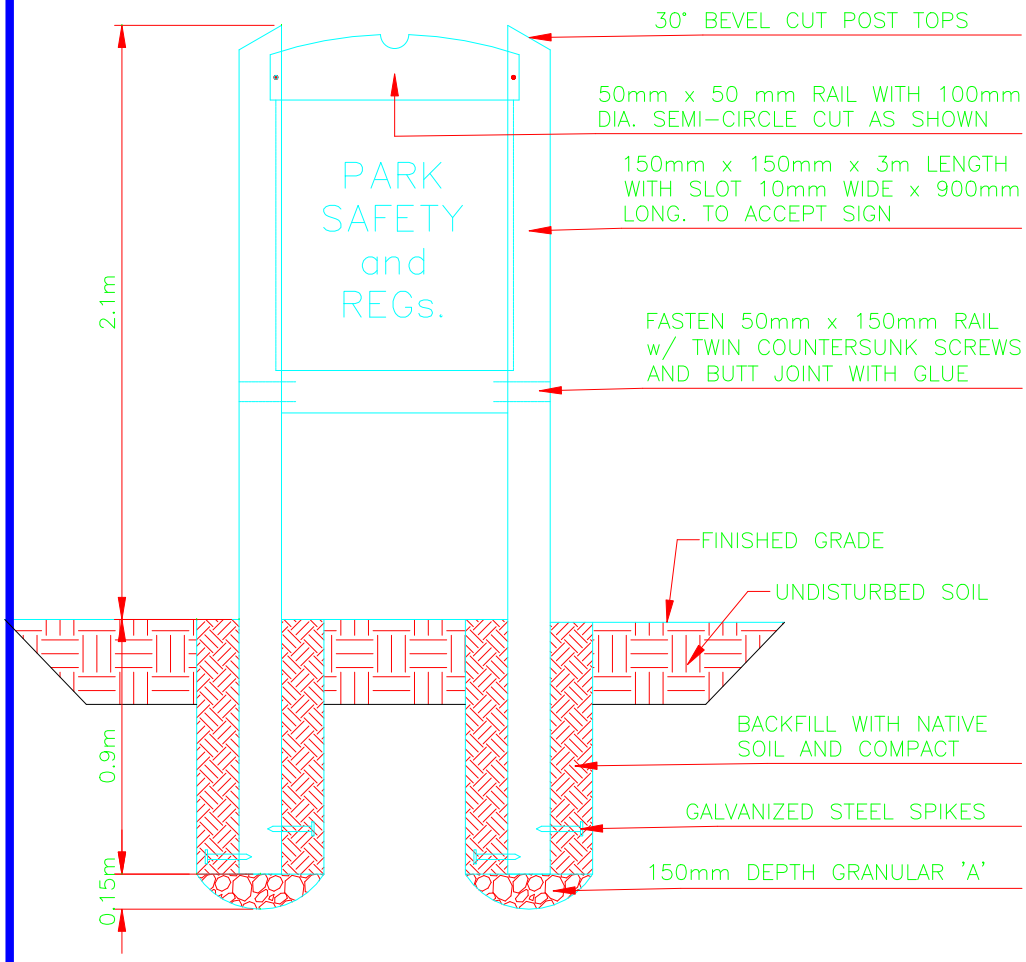
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

STANDARD PARK SIGN
COLOURS and GRAPHICS

APR'D:	DATE: 2012
DRAWN:	SCALE: NTS

STD. No. 3.17–01A



NOTES

1. ALL HARDWARE TO BE HOT DIPPED GALVANIZED.
2. ALL WOOD TO BE SANDBLASTED RED CEDAR.

TOWNSHIP of ORO-MEDONTE

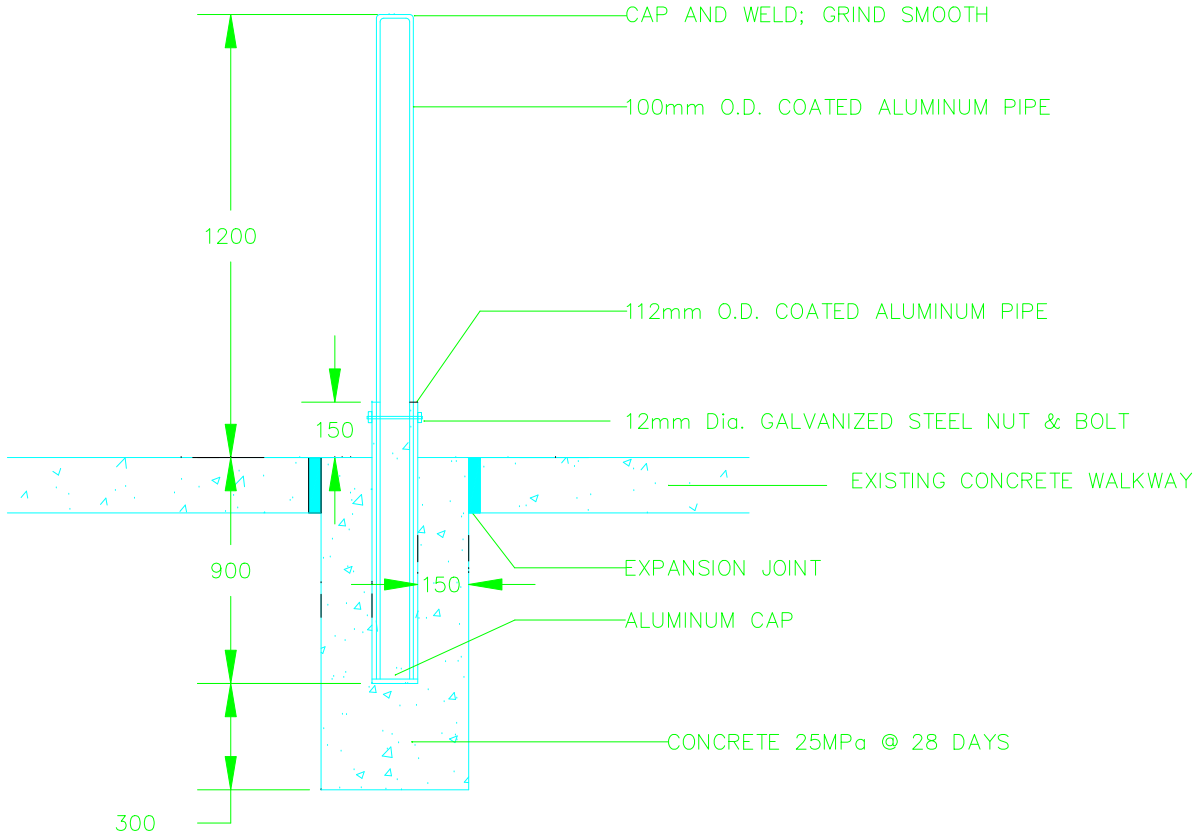
Oprerations and Community Services

STANDARD PARK SIGN

* For illustration purposes only.
* Sign Panel, Lettering, Post Colours and Township Logo colour scheme to be confirmed with Recreation and Community Services prior to placement of any Park signage.

NO.	REVISION	APR'D	DATE
1	Operations and Community Services		05/23

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
PARK SAFETY & REGULATION SIGN	STD. No. 3.17-02	

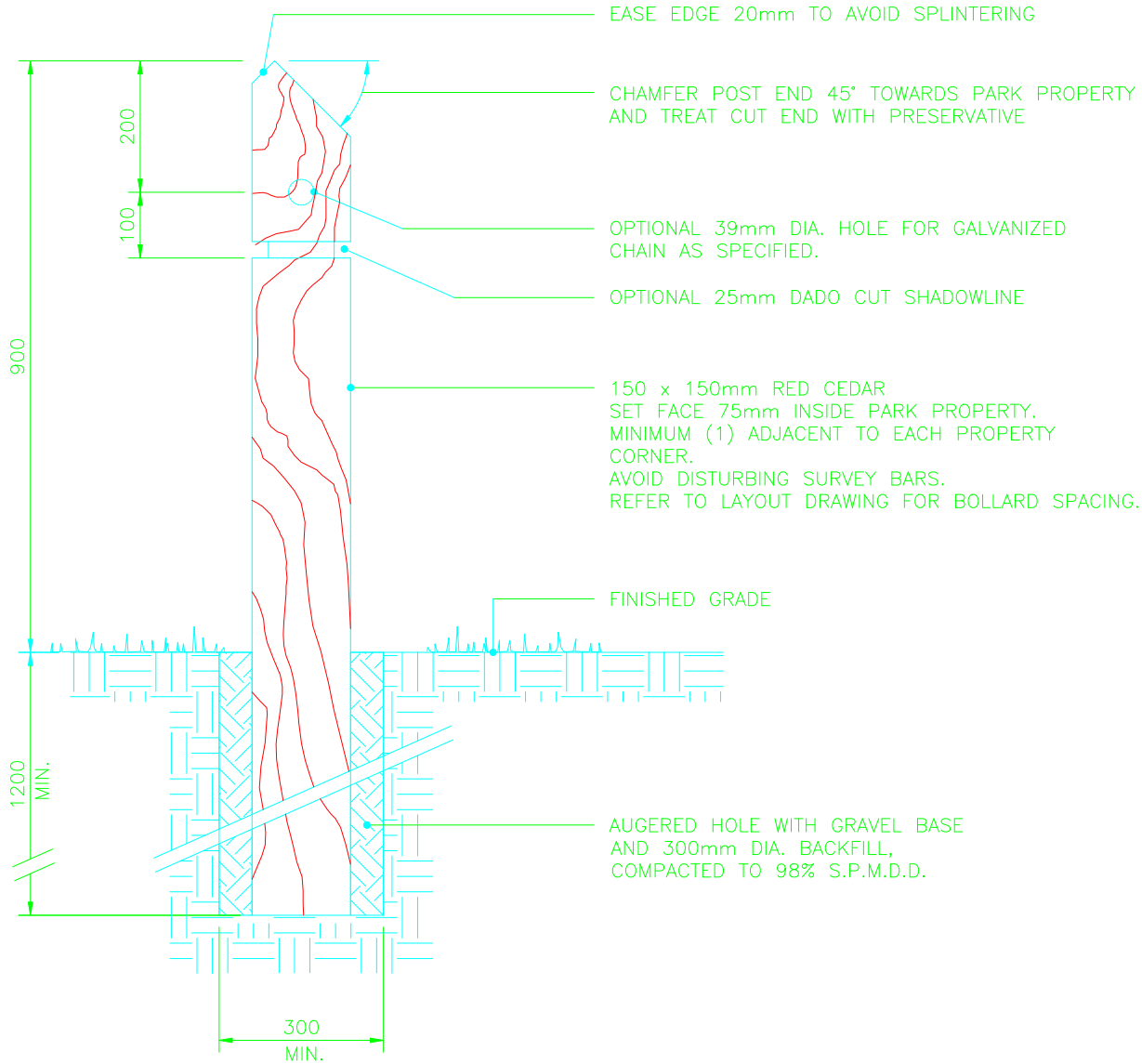


NOTE:

1. POST TO BE CENTERED IN MAJOR WALKWAYS.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
REMOVABLE BOLLARD	STD. No. 3.17–03	



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE		APR'D:	DATE: 03 / 2016
		DRAWN:	SCALE: NTS
TIMBER BOLLARD		STD. No. 3.17–04	

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3.18 Standard Detail Drawings and General Notes

The Township of Oro-Medonte Standard Drawings, Standard Details and General Notes shall be utilized whenever applicable.

The use of the latest revision of the Ontario Provincial Standard Drawings may be utilized as specified in this document or when approved by the Township.

These drawings shall be reproduced as part of the engineering drawings for the development and shall be referred to by number on the affected plan and profile drawings.

The Developer's Consulting Engineer shall be responsible to check the suitability of the details provided on these Standard Detail Drawings and General Notes for the application proposed.

Individual details shall be provided by the Developer's Consulting Engineer for **all** special features not covered by the Township of Oro-Medonte Standard Drawings.

These special details shall be drawn on standard sized sheets and shall be included as part of the engineering drawings.

The minimum scale to be used for special maintenance holes or sewer details shall be 1:25.

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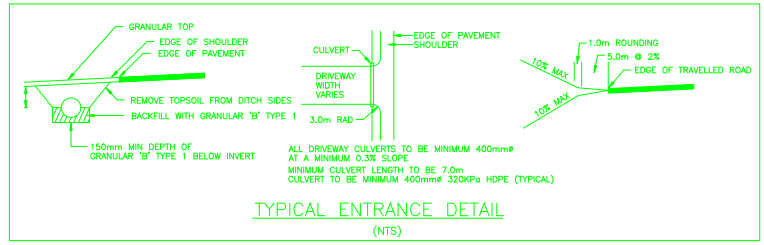
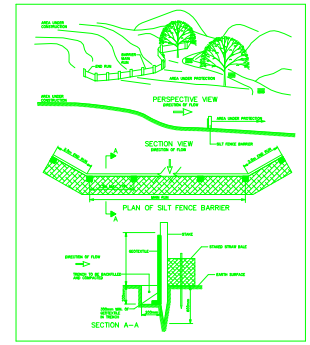
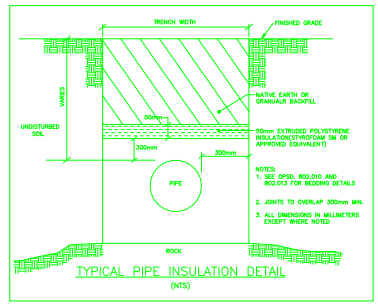


TYPICAL ENTRANCE DETAIL

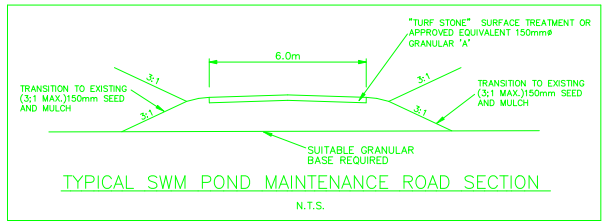
(NTS)





TYPICAL PIPE INSULATION DETAIL

(NTS)



TYPICAL SWM POND MAINTENANCE ROAD SECTION

N.T.S.

TOWNSHIP of ORO-MEDONTE

Development Services Department

TYPICAL
STANDARD DETAILS

* The "Typical Details" pictured in this drawing are for illustration purposes ONLY.
* Actual Design, Manufactures Specifications and other details as to construction and are to be displayed here to ensure accuracy in design and correct installation.

GENERAL NOTES
1. ALL DIMENSIONS, ELEVATIONS AND SIZES ARE IN METRIC UNITS UNLESS OTHERWISE INDICATED
PIPE SIZES ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.
ELEVATIONS ARE IN METRES UNLESS OTHERWISE INDICATED.

BENCH MARK DATA

NO.	REVISIONS	DATE	APPROVED

TOWNSHIP of ORO-MEDONTE APPROVED
DATE.....
.....
Manager of Development Engineering

TYPICAL STANDARD DETAILS

Typical Standard and Specific Details

TOWNSHIP of ORO-MEDONTE DEVELOPMENT SERVICES DEPARTMENT

SCALE HOR.	VERT.	DRAWING NO.
DESIGN	DRAWN	SHEET NO.
REVIEWED	DATE	

NO.	REVISION	APR'D	DATE
1	Manager of Development Engineering		05/23
2	Development Services Department		05/23

TOWNSHIP OF ORO-MEDONTE

STANDARD DETAILS SHEET

APR'D:

DRAWN:

DATE: 03 / 2016

SCALE: NTS

STD. No. 3.18-01

GENERAL NOTES

1) All standards in accordance with current Ontario Provincial Standard Drawings (OPSD) and Ontario Provincial Standard Specifications (OPSS) unless otherwise noted.
2) All dimensions are in metres. Pipe sizes in millimetres unless otherwise noted.
3) Notify ALL Utility services Bell Canada, Hydro One, Enbridge Gas, T.C.P.L and Cable T.V. providers (where applicable) with sufficient time to accommodate service locates.
4) The Contractor shall coordinate the works with the Developer's Engineer who shall oversee the project on behalf of the Developer.
5) All construction to be completed to the satisfaction of the Township of Oro-Medone and the Developer's Engineer.
6) All services and utilities to be supported as per OPSD-1007.01.
7) All trenching to be in accordance with the Occupational Health and Safety Act.
8) All traffic control and signage to be in accordance with M.T.O. requirements.
9) The Township of Oro-Medonte and the Developer's Engineer to be notified at least 48 hours prior to construction.
10) Wherever pipes are passing through uncompacted fill areas, the bedding trench shall be excavated to the undisturbed ground level and backfilled with Granular 'A' compacted to 95% modified proctor density or as otherwise shown on the drawings.
11) Maintain a minimum cover of 1.8m for watermains or as otherwise shown on the drawings.
12) Perform all blasting in accordance with the specification. Undertake pre-blast survey and provide copy to the Township of Oro-Medonte and the Developer's Engineer prior to commencement of blasting operations.
13) The location of underground and above ground utilities and structures shown on drawings is approximate only and may not be complete. The exact location of all utilities and structures shall be determined by consulting the Municipal authorities and Utilities companies concerned. The contractor shall prove the exact location of all utilities and structures before construction and shall be responsible for adequately protecting them against damage, assuming all liabilities for damage of such.
14) The Contractor must check and verify dimensions, obtain all utility locates, and obtain all required permits and licenses and verify existing service elevations before proceeding with any work.
15) Latest approved drawings to be used for construction and all discrepancies reported to the Township of Oro-Medonte and the Developer's Engineer.
16) Drawings are not to be scaled.
17) All materials to be used on this project shall be lead free.
18) Pipe length as labeled is measured horizontally along pipe centre line and may differ from baseline chainage where baseline is not parallel to pipe.
19) Utilize erosion and siltation controls as required and approved during construction.
20) Ensure accessibility to existing residential driveways at all times.
21) Ensure adequate protection to all culverts.

RESTORATION NOTES

1) Reinstate roads to previous condition or better.
2) Contractor to restore driveways and ditch work in areas disturbed by construction to equal or better conditions.
3) Minimum gravel driveway restoration to be 150mm, Granular 'A'. Asphalt Driveway restoration to be 50mm of HL4.
4) All grassed areas disturbed during construction shall be restored with 50mm topsoil and soded or hydro mulched as per OPSS 507. Maintain until established.
5) All restoration work to be completed to the satisfaction of the Manager of Public Works and Operations.

EXISTING CONDITIONS

The position of existing above ground and underground utilities and facilities are not necessarily shown on the drawings, and where shown, the accuracy of the position of such utilities and facilities is not guaranteed. Before starting work, the contractor shall confirm the exact location of all existing utilities and facilities, and shall assume all liability for damage to them.

Drawings shall not be used for construction unless sealed. All work to be performed in accordance with the most revent version of the Occupational Health and Saftey Act.

Any errors and/or omissions shall be reported to Xxxxxxxxxx Engineering Ltd. or to the Township of Oro-Medonte, without delay.

APPLICABLE ONTARIO PROVINCIAL STANDARDS

102 Weighing of materials
120 General Specifications for the use of Explosives
127 Schedule of rental rates
201 Clearing and grubbing
206 Stripping of organic material, rough & fine grading
310 Asphaltic concrete hot mixed, hot laid and hot mix patching
314 Untreated granular subbase, base, surface, shoulder and stockpiling
351 1.5M wide concrete sidewalk
353 Concrete curb and gutter systems
407 The construction of manholes, catchbasins, ditch inlets and valve chambers
408 Adjusting or rebuilding manholes, catchbasins, ditch inlets and valve chambers
410 Pipe sewer construction by open cut method
412 Sewage forcemain construction by open cut method
421 Pipe culverts
501 Compacting
502 Weighing of materials
503 Site preparation
504 Preservation, protection and reconstruction of existing facilities
506 Dust suppressants
507 Restoration
510 The demolition and removal of structures
511 Rip rap, rock protection and gravel sheeting
514 Trenching, backfilling and compacting
515 Rock excavation for pipelines and structures in open cut
516 Excavating, backfilling and compacting for manholes, catchbasins, ditch inlets and valve chambers
517 Dewatering
518 Control of water
538 Shoring and bracing
539 Protection schemes
543 Traffic control signing
565 Protection of trees
570 Topsoil
571 Construction specifications for sodding
572 Construction specifications for seeding and mulching
601 Electrical work - general
603 The installation of ducts
604 Cable installation
609 Grounding
615 Pole erection
617 The installation of roadway luminaires
701 Watermain construction for open cut method

TOWNSHIP of ORO-MEDONTE
Development Services Department
GENERAL NOTES
* The "GENERAL NOTES" generic versions are for illustration purposes ONLY.
* Notes should be reviewed and reflect the most recent Township Standards, OPSS/OPSD and any other agency or legislation included.

GENERAL – CONSTRUCTION

A. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH TOWNSHIP OF ORO-MEDONTE STANDARDS, O.P.S.D. AND O.P.S.S. WHERE
B. CONFLICT OCCURS, TOWNSHIP STANDARD TO GOVERN.
C. TRENCH BACKFILL (OPSD 802.XXX AS APPLICABLE) TO BE SELECT NATIVE MATERIAL OR IMPORTED SELECT SUBGRADE TO OPSS 1010.
D. BACKFILL TO BE PLACED IN MAXIMUM 200 mm THICK LIFTS AND COMPACTED TO 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
E. PIPE BEDDING TO BE GRANULAR 'A' PIPE COVER TO BE GRANULAR 'B' MAX. AGGREGATE SIZE 25mm FOR RIGID PIPE AND GRANULAR 'A' FOR FLEXIBLE PIPE. (MINIMUM BEDDING DEPTH 150 mm, MINIMUM COVER 300mm, COMPACTED TO A MINIMUM 95% SPMDD).
F. CLEAR STONE WRAPPED IN FILTER FABRIC CAN BE SUBSTITUTED FOR BEDDING MATERIAL IF APPROVED BY THE TOWNSHIP OF ORO-MEDONTE.
G. ALL MAINTENANCE HOLES ARE 1500 mm DIAMETER UNLESS OTHERWISE SPECIFIED.
H. ALL TOPSOIL AND EARTH EXCAVATION TO BE STOCK PILED OR REMOVED TO AN APPROVED SITE AS DIRECTED BY THE TOWNSHIP OF ORO-MEDONTE ENGINEER.
I. THE OWNER'S ENGINEER SHALL PROVIDE BENCH MARK ELEVATIONS AND HORIZONTAL ALIGNMENT REFERENCE FOR THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED LAYOUT OF THE WORK.
J. ALL PROPERTY BARS TO BE PRESERVED AND REPLACED BY O.L.S. AT CONTRACTOR'S EXPENSE IF REMOVED DURING CONSTRUCTION.
K. ALL MAINTENANCE HOLE AND CATCHBASIN FRAMES AND COVERS TO BE SET TO BASE COURSE HL4 ASPHALT ELEVATION AND RAISED PRIOR TO PLACEMENT OF FINAL COURSE HL3 ASPHALT TO THE SATISFACTION OF THE TOWNSHIP.
L. THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR THE SUPPLY OF TEMPORARY WATER AND POWER.
M. DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS-517 AND 518 TO MAINTAIN ALL TRENCHES IN A DRY CONDITION. CONTRACTOR RESPONSIBLE FOR OBTAINING M.O.E. PERMIT IF REQUIRED.
N. ALL ENGINE DRIVEN PUMPS TO BE ADEQUATELY SILENCED, SUITABLE FOR OPERATION IN A RESIDENTIAL DISTRICT.
O. DISTURBED AREAS TO BE REINSTATED TO PREVIOUS CONDITION OR BETTER.
P. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVATION OF ALL EXISTING FACILITIES AS WELL AS ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK AND CO-ORDINATE CONSTRUCTION ACCORDINGLY.

ROADS

A) SUBGRADE AND BOULEVARD MATERIAL TO BE COMPACTED TO A MINIMUM DRY DENSITY OF AT LEAST 95% SPMDD. SUBGRADE TO BE PROOF ROLLED AND CERTIFIED PRIOR TO PLACING GRANULAR 'B'.
B) GRANULAR 'A' AND 'B' BASE TO BE COMPACTED TO 100% OF THE MATERIAL'S RESPECTIVE SPMDD.
C) ROADWAYS TO BE CONSTRUCTED WITH MIN. 300MM GRANULAR 'B' TYPE 1, 150 MM GRANULAR 'A', AND 50 MM HL8 BASE 40 MM HL3 SURFACE COURSE ASPHALT. ALL SUBDRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSS 405.
D) SELECT SUBGRADE MATERIAL, OR IMPORTED GRANULAR MATERIAL APPROVED BY THE ENGINEER, COMPACTED TO 98% S.P.M.D.D. TO BE USED AS FILL IN ALL AREAS WHERE PROPOSED PIPE INVERTS ARE HIGHER THAN EXISTING GRADE OR AS INSTRUCTED BY THE ENGINEER.
E) ALL GRANULARS AND ASPHALT MATERIALS AND PLACEMENT TO BE IN ACCORDANCE WITH OPSS 314 AND OPSS 310
F) JOINTS WITH EXISTING ASPHALT TO BE SAW CUT STRAIGHT PRIOR TO PLACING ASPHALT AND DENSO TAPE APPLIED TO EXISTING ASPHALT.
G) STOP SIGNS AND STREET SIGNS TO TOWNSHIP STANDARDS.
H) REINSTATEMENT OF ALL DISTURBED BOULEVARDS TO INCLUDE REGRADING, 100mm TOPSOIL AND SOD TO OPSS 570 AND 571.
I) CONCRETE CURB AND GUTTER TO OPSD 600.030 OR OPSD 600.070 AND OPSS 353
J) CONCRETE SIDEWALK TO OPSD 310.010, 310.030 AND OPSS 351. SUBBASE TO CONSIST OF MINIMUM 150 mm OF GRANULAR 'A'.
K) 150 mm DIAMETER PIPE SUBDRAINS SHALL BE PROVIDED AS PER STANDARD 210 ON BOTH SIDES OF THE ROAD (WHERE APPLICABLE).
L) SUBDRAIN TO BE INSTALLED 200 mm BELOW CURB IN GRANULAR 'A' TRENCH AND CONNECTED TO EACH CB OR CBMH.
M) SUBDRAINS TO BE PERFORATED OTHER THAN THE 2.0 m SECTION IMMEDIATELY UPSTREAM OF ALL STRUCTURES WHICH SHALL BE NON-PERFORATED.

STORM SEWERS

A) M.H., CBMH AND DICBMH TO OPSD – 701.XXX (AS APPROPRIATE) C/W SUMP UNLESS NOTED OTHERWISE.
B) STEPS TO OPSD 405.010.
C) M.H. FRAMES AND GRATES TO OPSD-401.01 OPEN COVER.
D) C.B.'S TO OPSD – 705.010, 705.020
E) DICB'S TO OPSD – 705.030, 705.040, 706.010, 706.020, 706.030, 706.040
F) C.B. AND CBMH FRAMES AND GRATES TO OPSD – 400.020 AND REAR LOT 400.120..
G) PIPE SUPPORT AT M.H.'S, CB'S AND CBMH'S TO OPSD – 708.020.
H) C.B. LEADS – 300mm DIA SINGLE AND 375mm DIA DOUBLE TO OPSD – 708.010, 708.030.
I) PROTECTION DURING CONSTRUCTION TO OPSD – 808.010.
J) BEDDING AND COVER TO OPSD – 802.010. (FLEXIBLE PIPE) GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL OR OPSD – 802.030, 802.031 AND 802.032 (RIGID PIPE) GRANULAR 'A' BEDDING AND GRANULAR 'B' (MAXIMUM AGGREGATE SIZE 25mm) COVER.
K) TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.
L) BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD.

SANITARY SEWERS

A) M.H.'S TO OPSD-701.XXX AS APPROPRIATE.
B) BENCHING TO OPSD – 701.021. NOTE: MINIMUM HOLE SIZE I WALL IF PRE-CAST RISER SECTION SHALL CONFORM WITH MANUFACTURER'S SPECIFICATIONS.
C) STEPS TO OPSD – 405.010.
D) FROST STRAPS SHALL BE INSTALLED ON ALL MAINTENANCE HOLE AS PER OPSD – 701.100
E) BEDDING AND COVER TO OPSD – 802.010 (FLEXIBLE PIPE), GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL.
F) TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.
G) FRAMES AND COVERS TO OPSD – 401.01 TYPE 'A' (CLOSED COVER).
H) SERVICE CONNECTIONS TO OPSD-1006.020 (125 mm), GRANULAR 'A' EMBEDMENT, TERMINATE AT THE PROPERTY LINE 2.5m RIGHT OF WATER SERVICE (FACING LOT) WITH A TEST FITTING, 125 X 100 REDUCER C/W PLUG AND 38mm x 89mm MARKER POST PAINTED GREEN. MINIMUM GRADE TO BE 2.0%.
I) RADIUS BENDS TO BE USED ON SANITARY SEWER CONNECTIONS WHERE THE ANGLE OF CONNECTION BETWEEN THE SERVICE AND SEWER EXCEEDS 90°.
J) BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
K) CLEAR STONE WRAPPED WITH FILTER FABRIC CAN BE SUBSTITUTED FOR EMBEDMENT MATERIAL IF APPROVED BY THE ENGINEER.
L) MAINTENANCE HOLE FRAMES TO BE SET TO BASE COURSE ASPHALT ELEVATION AND RAISED PRIOR TO PLACING SURFACE COURSE ASPHALT TO THE SATISFACTION OF THE TOWNSHIP.
M) PIPE SUPPORT AT MAINTENANCE HOLES AS PER OPSD 708.020.
N) ALL MAINTENANCE HOLES, UNLESS EXPRESSLY IDENTIFIED ARE 1500 mm DIAMETER.
O) GENERAL INSTALLATION AND TESTING OF SEWERS AND APPURTENANCES TO BE IN ACCORDANCE WITH O.P.S.S. 407, 408, 409 (CCTV), 410, 421 AND ALL SPECIFICATIONS REFERENCED WITHIN THESE SECTIONS.

WATERMAINS

A. BEDDING AND COVER TO OPSD-802.010, GRANULAR 'A' EMBEDMENT MATERIAL OR OTHER APPROVED HOMOGENEOUS GRANULAR MATERIAL.
B. TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.
C. THRUST BLOCKS TO OPSD-1103.010 AND 1103.020 WHERE SUITABLE SOILS ARE ENCOUNTERED.
D. SERVICE CONNECTIONS TO OPSD-1104.010, 100 mm GRANULAR 'A' EMBEDMENT AND COVER OVER PIPE. TERMINATE AT PROPERTY LINE AT CENTER OF LOT C/W CURB STOP AND BOX, TESTING TAIL TO SURFACE ATTACHED TO A 38mm x 89mm MARKER POST PAINTED BLUE.
E. HYDRANTS TO OPSD-1105.010. DRAIN PLUGS SHALL BE INSTALLED.
F. BACKFILL AND EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
G. MINIMUM COVER ON WATERMAIN AND SERVICES TO BE 1.7 m.
H. GATE VALVES, BENDS AND HYDRANT LEADS AND FITTINGS TO BE CONNECTED WITH ROMAX GRIP RING RESTRAINING CLAMP.
I. CLEARANCE BETWEEN WATERMAINS AND SEWERS TO BE A MINIMUM OF 0.5 m VERTICAL WHERE WATERMAIN IS BELOW SEWER OR 2.5 m MINIMUM HORIZONTAL SEPARATION. WATERMAIN SHALL BE ABOVE WHERE POSSIBLE. WHERE WATERMAIN IS ABOVE SEWER, THE MINIMUM SEPARATION TO BE 0.5 m (BEDDING MATERIAL).
J. SERVICE TO OPSD – 1104.010 AND SHALL BE DIRECT TAP.
K. FOLLOWING TESTING, CONTRACTOR SHALL OPERATE EACH WATER SERVICE TO VERIFY FULL FLOW AND PRESSURE AT THE CURB STOP TO THE SATISFACTION OF THE ENGINEER.
L. GENERAL INSTALLATION AND TESTING OF WATERMAIN AND APPURTENANCES TO BE IN ACCORDANCE WITH O.P.S.S. 701 AND ALL SPECIFICATIONS REFERENCED WITHIN THESE SECTIONS.

GENERAL NOTES
1. ALL DIMENSIONS, ELEVATIONS AND SIZES ARE IN METRIC UNITS UNLESS OTHERWISE INDICATED. PIPE SIZES ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED. ELEVATIONS ARE IN METRES UNLESS OTHERWISE INDICATED.

BENCH MARK DATA

NO.	REVISIONS	DATE	APPROVED

TOWNSHIP of ORO-MEDONTE APPROVED
DATE. ....
Manager of Development Engineering

TYPICAL GENERAL NOTES
Typical General Notes and Standard Details

TOWNSHIP of ORO-MEDONTE DEVELOPMENT SERVICE DEPARTMENT
SCALE HOR. | VERT. | DRAWING NO.
DESIGN | DRAWN | SHEET NO.
REVIEWED | DATE

NO.	REVISION	APR'D	DATE
1	Manager of Development Engineering		05/23
2	Development Services Department		05/23

TOWNSHIP OF ORO-MEDONTE

APR'D:
DRAWN:
DATE: 03 / 2016
SCALE: NTS

GENERAL NOTES SHEET

STD. No. 3.18-02

3.19 As-Constructed Drawings

The As-Constructed drawings constitute the original engineering drawings that have been amended to incorporate the construction changes and variances in order to provide accurate information on the works as installed in the development.

The As-Constructed Drawings shall be submitted, prior to the Final Acceptance and Assumption of the subdivision, by the Township.

These drawings shall show the location both horizontally and vertically of everything, which is on, and under the lands to be accepted by the Township.

These drawings shall be sealed and signed by a Registered Professional Engineer and stamped As-Constructed and dated.

The Township may perform spot checks of elevations and locations.

Should the Township find major differences, the As-Constructed drawings shall be returned to the Developer's Consulting Engineer to be corrected.

NOTE 1: The As-Constructed submission shall include a list of substantive grades, invert and material changes for ease of review.

NOTE 2: The As-Constructed digital drawing file shall be georeferenced. The standard coordinate system for Oro-Medonte is Universal Transverse Mercator (UTM) Zone 17 with the North American Datum 1983 (NAD83). The drawing units for all features in the file shall be in metric, set to metres and un-scaled (1:1).

NOTE 3: The As-Constructed digital drawing file shall be circulated to the Environmental Services Department in the above noted form for inventory of linear infrastructure purposes.

NOTE 4: Drawings shall be supplied in the standard hard copy format shall conform to the most recent AutoCAD requirements found in the Township Standards.

3.19.1 As-Constructed Field Survey

The As-Constructed revisions shall be based upon a final survey of **all** the subdivision services and the Developer's Consulting Engineer's construction records. The final survey of the subdivision services shall include a field check of the following items:

- Location and invert elevations of **all** sewer maintenance holes.
- Distances between **all** sewer maintenance holes.
- Location of **all** roadway catch basins.
- Location, rim and invert elevations for **all** rear yard and lot catch basins.
- Location of **all** sidewalks and curbs.
- Location and ties to **all** valve boxes and valve chambers.
- Location of **all** hydrants.
- Location to **all** special watermain appurtenances (i.e., blow offs, etc.)
- Road centreline elevations.
- Site benchmarks.
- Location of **all** service connections to **all** lots and blocks and location of connection from nearest downstream maintenance hole (i.e. 0 +023).
- Storm and Sanitary Sewer pipe sizes and percentage grades.
- Location of **all** fencing constructed as part of the subdivision services.
- Streetscape / Landscape / SWM Pond and Naturalization plantings.
- Parkland Development Plan.

Locations of the applicable street furniture described above shall also include swing ties to three fixed reference points and dimensioned on the As-Constructed drawings.

3.19.2 Drawing Revisions

The original drawings shall be revised to incorporate **all** changes and variances found during the field survey and to provide the ties and additional information to readily locate **all** underground services.

All sewer and road grades are to be recalculated to two decimal places.

All Street line invert elevations of storm and sanitary house connections to each block shall be noted on the drawing.

All road names**,** lot numbering and block identification shall be checked against the Registered Plan and corrected if required.

The As-Constructed revision note shall be placed on **all** drawings in the revision block. The title sheet of the Engineering Drawings shall be clearly marked **As-Constructed.**

3.19.3 Submissions

Upon completion of **all** construction work and the As-Constructed revisions, the original drawings shall be submitted to the Township for their permanent records.

The submission of the As-Constructed drawings and digital format to the Township shall be completed before Final Acceptance and Assumption of the subdivision shall be granted.

The Developer's Consulting Engineer shall provide a written declaration to the Township stating that the As-Constructed works represented in the As-Constructed Drawing set are in accordance with the terms of the Subdivision Agreement, approved Engineering Drawings prior to Final Acceptance and Assumption being granted.

3.19.4 Tolerances

A maximum vertical plotting tolerance of 0.2 m on the 1:50 vertical profile portion of the drawings and a maximum horizontal plotting tolerance of 1 metre on the 1:500 scale drawing shall be considered acceptable without replotting.

The information shown on the As-Constructed drawings may be checked by the Township at any time up to two years after Final Acceptance and Assumption of the subdivision and if discrepancies are found between the information shown on the drawings and the field conditions, then the drawings shall be returned to the Developer's Consulting Engineer for rechecking and further revision.

The Developer's Consulting Engineer shall be required to explain in writing any major difference between the design and the As-Constructed data and to provide verification that alteration does not adversely affect the design of the subdivision services.

NOTE 1: **All** Sanitary and Storm Sewer lengths are to be shown to the nearest 0.5 m.

NOTE 2: If the As-Constructed grade of either the Sanitary Sewer or Storm Sewer differs by more than 1% of the design grade, the Developer's Consulting Engineer shall submit revised hydraulic calculations.

3.19.4.1 Storm Sewers

All actual storm system invert elevations shall be indicated on the As-Constructed drawings. If the difference is greater than 150 mm from the design vertical alignment, affected portions of the sewer or overland drainage route shall be redrawn in profile. Any maintenance hole which differs from the proposed horizontal location by more than 1.50 m shall be redrawn in both plan and profile.

In addition, the following shall be indicated on the As-Constructed drawings:

- pipe/culvert size, grade, type, class;
- chainage from MH along main to service tees.

3.19.4.2 Sanitary Sewers

All actual sanitary sewer invert elevations shall be indicated on the As-Constructed drawings. If difference is greater than 150 mm from the design vertical alignment, affected portions of the sewer shall be redrawn in profile. Any maintenance hole which differs from proposed horizontal location by more than 1.50 m shall be redrawn in both plan and profile.

In addition, the following shall be indicated on the As-Constructed drawings:

- pipe size, grade, type, class;
- chainage from MH along main to service tees;
- dimensions from lot corners and elevations for service laterals.

3.19.4.3 Watermain

All actual watermain obvert elevations at 30 m intervals shall be indicated on the As-Constructed drawings.

If the difference is greater than 150 mm from design vertical alignment, affected portions of the watermain shall be redrawn in profile.

If horizontal alignment changes exceed 1.0 m the affected portions of the watermain shall be redrawn in plan.

In addition, the following shall be indicated on the As-Constructed drawings:

- pipe size, type, class
- swing ties to **all** main appurtenances (valves, bends, tees, etc.)
- chainage from appurtenance along main to main stops
- swing ties from lot corners to the curb stop valve box and the invert elevation of each curb stop

3.19.4.4 Roadways

All actual roadway centre line elevations, at a maximum 20 m interval, shall be indicated on the As-Constructed drawings. Gutter elevations shall be indicated for cul-de-sacs and intersections to show drainage into storm system. If horizontal road alignment changes more than 1.0 m or vertical geometry changes greater than 150 mm the plan and/or profile shall be redrawn as appropriate.

In addition, the following shall be indicated on the As-Constructed drawings:

- driveways, lay-bys, curb depressions
- road signage
- lane marking and stop bar locations

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3.20 Residential Lot Grading

3.20.1 General

The Engineered Lot Grading (ELG) Plans and Certification of Lot Grading is of primary concern to the municipality, and the following Township Standards shall apply to **all** residential development in the Township of Oro-Medonte.

The Residential Lot Grading Standards provide sites that are suitable for the erection of residential buildings and to provide satisfactory and environmentally sustainable drainage of lands to ensure that lot drainage shall not adversely affect adjacent properties or the environment.

Variances from these criteria *may be permitted* where the lot grading complies with the overall design and a reasonable balance is achieved between the provision of relatively flat amenity areas, effective drainage, the preservation of trees and reducing the environmental impact of stormwater runoff.

The Township shall accept ELG Plans and Certification of Lot Grading works from the following qualified professionals:

- Professional Engineer - P.Eng.,
- Ontario Land Surveyor – OLS
- Certified Engineering Technologist (C.E.T.).

Engineered Lot Grading plans are to be submitted at the time of Building Permit Application and by way of a Township accepted electronic submission method.

3.20.1.1 Requirements for Engineered Lot Grading

- All Lots contained within an Unassumed Plan of Subdivision
- All Lots contained within an Assumed Plan of Subdivision
- Lots defined as Infill Development – Urban / Settlement Areas / Rural (see 3.20.2)
- All Lots defined as Waterfront / Shoreline Development Areas (see 3.20.3)

- All Lots less than 0.20 hectares (0.5 acres) in size
- Additions having a ground floor area in excess of 22.3m^2 (240sq. ft.)
- Accessory buildings having a ground floor in excess of 22.3m^2 (240sq. ft.)
- Construction closer than 3.0 m (10 feet) to the property line
- Changes to existing grades (shaping / cut / fill) of more than 30cm (12”) in elevation within 3.0m (10ft.) of the Property Line
- Changes to Driveway location / width / length / grade
- Changes to Septic System location / size / grade

3.20.1.2 Engineered Lot Grading - Plans of Subdivision

The grading of **all** lots and blocks in new developments / plans of subdivision shall be carefully monitored by the Developer’s Consulting Engineer in order to provide sites that are suitable for the erection of buildings and to provide satisfactory drainage from **all** lands within the development. In this regard, the design of the grading for **all** developments shall be of primary concern to the Township and the following criteria shall be used in the preparation of **all** ELG Plans for new development in the Township.

Should an ELG Plan for Lots within an Unassumed Plan of Subdivision, be designed by a qualified professional other than the Developer’s Consulting Engineer, the Developer’s Consulting Engineer shall review and sign-off on the design prior to submission of said design to the Township for review and approval.

All lot drainage shall be in conformance with the Stormwater Management Report, overall Subdivision Grading Plans and Township Standards. The Developer’s Consulting Engineer shall be responsible for ensuring the grading of lots is completed to the satisfaction of the Township.

3.20.2 Infill Development – Urban / Settlement Areas / Rural

Including: Reconstruction / Additions / Detached Structures / Septic Systems

Infill Development shall be deemed to be:

a) Residential Development occurring outside of an active Plan of Subdivision
b) Residential Development of lands governed by a Subdivision Agreement

c) Residential Development of lands not governed by a Subdivision Agreement
d) Residential Development within a Settlement Area or Lots created by Consent

NOTE: Subject to the provisions contained in this section Infill Development – Urban / Settlement Areas / Rural shall comply with the remainder of Section 3.20 for Design and Detail Standards where applicable.

3.20.3 Waterfront / Shoreline Development Area
Including: Reconstruction / Additions / Detached Structures / Septic Systems

Waterfront / Shoreline Development Area residential development shall be deemed to be:

a) Residential / Recreational Waterfront development of lands.
b) Residential / Recreational development of lands contained within an identified Shoreline Residential Area.

NOTE 1: Subject to the provisions contained in this section Waterfront / Shoreline Development Area construction shall comply with the remainder of Section 3.20 for Design and Detail Standards where applicable.

NOTE 2: The Average Annual High Water Mark of Lake Simcoe is 219.15 m
The Average Annual High Water Mark of Bass Lake is 252.26 m

3.20.4 Additional Requirements

The following requirements (but not limited to) shall be evaluated and included in the ELG design for Infill and Waterfront / Shoreline Development:

- Finished grade elevations shall remain as close to original grade elevations as is practicable.
- Alterations to grades shall be designed and constructed such that no adverse effects result on the adjacent lot(s).
- Post-construction flows shall not exceed the flows for pre-construction conditions, unless demonstrated to the satisfaction of the Township that uncontrolled flows will not have adverse effects on adjacent properties or existing drainage patterns.

- The capacity and alignment of boundary swales shall not adversely affect adjacent properties.
- The maximum slope between dwellings for basement walkouts in any direction shall be 3:1 with a grade differential not exceeding 2.5 m.
- Identification of:
    - the location and direction of flow of watercourses within property boundaries.
    - the location of wetlands or floodplains within property boundaries.
    - Well locations shall be shown for adjacent lots where the proximity to the construction of on-site services may be a factor or may be affected.
    - Septic System locations shall be shown for adjacent lots where the proximity to the construction of on-site services may be a factor or may be affected.
    - Setback from the Average Annual High-Water Mark shall be delineated.

NOTE 1: If an existing drainage course (either seasonal or year-round) is located within the property then the location shall be shown on the ELG Plan. Any change to or redirection of the existing drainage may require approvals by additional agencies and / or a consultant's report outlining the method of construction and the effect of the redirection.

NOTE 2: Where sanitary and water service connections, not already in place along the municipal road allowance and / or stubbed to the property lines, these services shall be installed by a Qualified Contractor and both inspected and witnessed by the Township's Environmental Services Department at the owner's / applicant's expense. Connection locations shall be noted on the ELG Plan.

NOTE 3: A Driveway Entrance Permit and / or Road Occupancy Permit allowing for access to a lot of record may be required should an approved entrance not already exist. Determination as to the location and width of the driveway, and culvert sizing shall be made by the Operations and Community Services Department. Delineation of the Driveway Location, Grade and Culvert Location / Size shall be included on the ELG Plan.

NOTE 4: To prevent the migration of silt and sediment into watercourses and water bodies during construction, the importation and stockpiling of fill material shall be accomplished such that material storage is protected by way of Silt and Sediment Control Measures including (but not limited to) silt fence, straw bales and appropriate stockpile locations of construction and landscape soils. Material shall not be stored in areas designated as floodplain or areas located within the Average Annual High-Water Mark as delineated on the ELG Plan.

NOTE 5: Shoreline development including (but not limited to) docks, decks, stairs, boathouses and alterations to the natural landscape may require additional review or permits from other regulatory agencies.

3.20.5 Engineered Lot Grading Design

- The direction of storm water flow in swales shall be indicated with an arrow and percentage grades.
- Elevations are to be in relation to geodetic benchmarks or approved alternative.
- **All** easements, blocks and rights-of-way are to be indicated on plan.
- Any water course running through or abutting the proposed development including the identification of the regional storm water levels shall be shown.
- **All** lots identified with engineered fill shall have a notation indicating **Engineered Fill** on the proposed lot grading plan and the fill location(s) delineated.
- Lot Grading plans shall be stamped by the Developer's Consulting Engineer to confirm conformance with these criteria and the overall grading plans.
- Lot Grading plans shall be designed in such a way so as to preserve existing trees wherever possible.
- Front yards shall be graded to drain towards the road wherever possible.
- Rear to front lot grading is permitted preferred with a maximum of three rear lots out letting between any two lots.
- **All** boulevard areas shall be graded with a constant slope from the curb to the road limit (minimum slope to be 2%, maximum slope to be 5%) and **all** curb stops, maintenance hole covers, and valve boxes, etc. shall be set flush with the finished sod surface.

- Downspouts, sump discharge and swales shall not outlet to/overtop driveways or be directed to septic beds or septic tanks.
- **All** rear yard drainage shall be directed away from the houses in defined swales which outlet at the curb, sidewalk or a rear yard swales.
- Overland flow routes shall be provided for **all** rear yard catch basins which shall protect **all** structures in the event of catch basin blockage or a major storm event.
- Drainage within the proposed development limit is to be provided internally. Any proposed drainage over abutting / adjacent lands shall only be permitted in with express written agreement with the adjacent property owner(s) and is to be included as part of the subdivision agreement and legally registered.
- The grading along the limit of the proposed development shall be carefully controlled to avoid disturbance to the adjoining areas. In general, lot drainage shall be directed away from top of banks or valley slopes.
- The lot grading design shall include provisions for drainage conditions on an adjacent property that can be best resolved by permitting drainage through the proposed development. Express written agreement allowing for drainage provisions is to be included in the subdivision agreement and legally registered.
- **All** lot surfaces shall be constructed to a Minimum grade of 2.0%.
- A minimum of 5.0m abutting the rear of the house shall be graded at 2-7% slope.
- **All** lot surfaces shall be constructed to a **maximum average grade** of 12% (calculated from the difference in lot elevations between the rear wall of the house and property line - embankments included).
- Maximum slope between **all** terraces and embankments shall be 3:1 when the vertical difference does not exceed 1 metre and 4:1 when the vertical differences exceed 1 metre. Between successive terraces, an intermediate level area of at least 1.50 metres in width shall be provided.
- The maximum flow allowable to any side yard swale shall be that from the equivalent of three lots or 0.5 hectares, whichever is the lesser.
- The maximum area contributing to a rear yard swale that may be discharged directly onto a road allowance shall be the equivalent of three rear yards or 0.50 hectares, whichever is the lesser.

Swales providing internal drainage from each lot shall have:

- Minimum slope of 2.0%.
- Minimum depth of a swale shall be 150 mm. @ 3h:1v
- Maximum depth for a side yard and mid-yard swale shall be 450 mm. @ 4:1
- Maximum depth for a rear yard swale shall be 750 mm. @ 5:1
- The **Maximum** side slope on any swale shall be 3:1.
- Mid-yard Cut-Off Swales (typ. Rear to Front draining lots) shall be sized and located such as to capture and redirect flow away from residential structures.
- **All** drainage swales shall be located on lot lines unless the adjacent property is not undergoing development. In such cases drainage swales shall be located entirely within the lot being developed. This applies predominantly to Lots being developed adjacent to previously developed Lots that are not included in the Plan of Subdivision or Lots being developed / re-developed as an Infill Lot.
- Each lot shall have at least one side yard with a maximum slope of 7% for 1.5 m continuous width from front to rear yard.
- The % grade around houses shall be a minimum of 2% away from houses from a point 150 mm below top of foundation wall or as required by the Ontario Building Code (OBC).
- Rear yard catch basins shall be eliminated wherever possible. When approved, rear yard catch basins and outlet pipes shall be located such that the outlet and the catch basin are located entirely on the same lot. In general, rear yard catch basins shall be located 2.0 metres from the lot lines.

3.20.5.1 Driveways

- Houses shall be sited and driveways located to maximize the amount of off-street parking available to the residence.
- Wherever possible, the driveways shall be on the higher side of the lot.
- Driveways shall be set back a minimum of 1.5 m from any tree or above ground Utility device (hydrants, hydro vaults, light standards, etc.).
- The maximum grade for driveways shall be 7% and the minimum grade shall depend upon the nature of the surface and not be less than 2%.

- Where sidewalks exist or are proposed, driveway grades are to be compatible with approved sidewalk grades.
- Driveway locations shall not extend past lot line projections within a right-of-way.
- Curb Stops, valves or hardware shall **not** be located within the driveway.
- Downspouts, sump pumps and drainage swales are not permitted as discharge outlets onto Driveways.
- Driveway locations shall be in accordance with the approved Engineering Drawings.
- Driveways shall not be constructed over or within sewage envelopes.

3.20.5.2 Sodding and Seeding

The subdivision shall be sodded / seeded according to the following:

- **all** swales, ditches, drainage easements, and slopes 10% or greater shall be sodded using 100 mm screened topsoil and No. 1 nursery sod;
- **all** residential lots shall have a minimum of 100 mm screened top soil and sod for the front yard and within 5.0m of the rear of the building
- hydro-seed application over a minimum of 100 mm screened top soil may be used as an alternative for the remainder of the rear yard.
- where the combined side yard between buildings is less than 3.0 m combined or 1.5 m on any one side, the surface treatment shall be 75 mm of clear stone over a vegetation suppressing geotextile.

3.20.5.3 Retaining Walls

Retaining Walls greater than 600mm in height are <u>discouraged</u> and shall be reviewed when the ELG Plan design warrants.

Retaining walls shall be constructed according to the following:

- **all** retaining walls shall comply with the Township's Zoning By-law requirements
- where retaining walls are required to adjust grade elevations
- retaining walls shall be constructed on the higher lot such that the wall and tie-backs do not cross property lines
- **all** retaining walls are to be constructed **wholly on private property and only one property**, **and not on property to be assumed by the Township**

- a detailed drawing of the design (including but not limited to): location, property line(s), height of wall, tiebacks shall be submitted for approval. Construction details of retaining walls shall be included with the ELG Plan and be approved by the Township of Oro-Medonte.
- the **maximum** height of any retaining wall constructed on a property line between two (2) residential lots shall be 1.0 m in exposed height
- retaining wall height shall be measured from finished grade to the highest point of the wall.
- retaining walls constructed with an exposed face height of greater than 1.0 m in exposed height shall be constructed with a **minimum** distance of 2.0 m from the side or rear lot line.
- should the exposed height of a retaining wall exceed 1.0 m in exposed height at any point then the exposed height of the retaining wall shall be deemed to be 1.0m in exposed height for its entire length
- retaining wall design and construction of greater than 1.0 m in exposed height shall be certified by a Professional Engineer.

NOTE: If the retaining wall has an exposed height of greater than 1.0 m, and is adjacent to public property, access to a building, or private property to which the public is admitted, a building permit in accordance with the Ontario Building Code Act may be required.

3.20.5.4 Engineered Fill

Should the existing site conditions require the placement of Engineered Fill, the following provisions shall be adhered to:

- Prior to the submission of a Building Permit application, a Geotechnical Engineer shall certify that based on their field investigation, the compacted Engineered Fill is capable of safely sustaining an allowable bearing pressure as per the Ontario Building Code.
- The designer of the ELG Plan shall clearly identify the proposed Engineered Fill envelope on the ELG Plan.

- Prior to footings construction, the geotechnical consultant shall inspect the excavation and certify that the soil is the proper allowable bearing pressure.
- A copy of this inspection report shall be submitted to the Building Department prior to proceeding with footing construction

3.20.6 Engineered Lot Grading Plan Drawing Requirements

Drawings shall be sufficiently large to clearly illustrate **all** details including relevant features beyond the property boundaries.

Symbols and conventions used on lot grading plans shall conform to the Township of Oro-Medonte Development Engineering Policies, Process and Design Standards.
Prior to application for a building permit, individual lot grading plans for each lot shall be approved by the Developer's Consulting Engineer prior to submission to the Township.

ELG Plans shall display the following information:

- Developer's / Owner's / Applicant's Name
- Lot Description - R or M Plan #, Lot # and Designated Municipal Address
- Signature / Seal of Applicants Lot Grading Designer * Notice of Review by Engineer of Record in accordance with a Subdivision Agreement (as required)
- Design Date and Submission #
- North Arrow and Key Plan
- Metric Scale of Drawing – of a typical engineering scale
- Geodetic Benchmark - location and elevation
- Dimensioned Property Limits / Boundaries and Lot Corner Elevations
- Typical Silt and Sediment Control Measures
- Location of Silt and Sediment Control Measures
- Typical Swale Cross Section(s) – side yard / mid-yard / cut-off (as required)
- Location, Elevation, Flow Direction and % Grade of all Swales
- Location of Engineered Fill
- Location of Environmentally Protected Areas / Waterbodies / Shoreline
- Top and Bottom of Slope / Topographic Detail (For Septic Location - as required)
- Location of Existing Trees to be Retained

- Location and Type of Utility Services (Natural Gas, Bell, Hydro, Cable T.V., etc.)
- Location of Municipal Water Service **OR**
- Location of Private Well and 15.0m Setback Radius
- Location of Municipal Sanitary Service **OR**
- Location of Private Sewage System – Septic Bed, Tank and Grade Elevations
- Location and Dimension of Municipal / Utility / Drainage Easements
- Driveway - location, proposed % grade, width and curb cut locations
- Driveway Culvert – location, size, length, material, elevations and % grade
- Elevations of Road Grade (edge of road and centre line) adjacent to Lot Line(s)
- Elevations of and % grade of Road Side Ditches adjacent to Lot Lines
- Street Furniture / ROW Features – hydrants, streetlights, Bell / Cable pedestals, Hydro transformers / poles, catch basins, curbs, sidewalks, retaining walls, etc.
- Building(s) Location: lot line setback distances and building corner elevations
- House and Lot Type: rear to front /split lot / walk-out basement, etc.
- Location of Internal Catch Basins / Soak Away Pits - grate and invert elevations
- Location of Sump Pump discharge (not discharging to driveway or septic tank)
- Location of all Rainwater Leaders / Downspouts (not discharging onto driveway)
- Finished First Floor elevation (F.F.F.)
- Top of Foundation Wall elevation (T.F.W.)
- Finished Basement Floor elevation (F.B.F.)
- Underside of Footings elevation (U.S.F.)
- Finished Garage Floor elevation (F.G.F.)
- Underside of Footings Garage elevation (U.S.F.G.)
- Location and Elevation of all Entrances including # of Risers
- Location and Elevation of all Walkways, Patios, Deck and Porches
- Location and Elevations (Top and @ Grade) of Retaining Walls

NOTE: The Residential Lot Grading Design Checklist is found at the end of this Section

3.20.7 Certification

Prior to the release of any lot from the conditions of the Subdivision Agreement or Building Permit, the Applicant's P.Eng, OLS or C.E.T. shall provide certification to the Township that the grading and drainage of each lot is in accordance with the approved Subdivision overall grading and drainage plans and the Engineered Lot Grading Plan (submitted as part of the Building Permit application).

This Engineered Lot Grading Certification shall include:

- A copy of the **APPROVED** ELG Plan
- A Letter certifying that the final site conditions are in conformance with above.

If the final grading differs from the approved lot grading plan (0.15m tolerance), the Applicant's P.Eng, OLS or C.E.T. shall provide details of the variance from the approved plans and shall include his recommendations for corrections / rectification - as required.

All of the following items (as applicable) and any others specific to the design shall be inspected for completion and accuracy:

- Letter of Certification complete with Signature / Seal of Grading Plan Designer
- Approved E.L.G. Drawing included with Letter - Design Date and Submission #
- Swale Locations - Side Yard / Cut-off / Rear Yard
- Swale Depths - 0.15m min. / 3:1 max. side slopes
- Swale Grades - % Slope and Running Direction
- Max. Grading Difference @ 3:1
- Match Grades to All Adjacent Lot Lines
- Grades at Setbacks to Tree Protection / Naturalized / Environmental / Water Body / Shoreline
- Grades Matching Road Grade Adjacent to Lot Lines
- Grades Matching Roadside Ditches Adjacent to Lot Lines
- Grades / Swales Account for Street Furniture / R.O.W. Feature Locations
- Grades of Municipal or Utility or Drainage Maintenance Easements
- Building Corner Grade Elevations (inc. Breakpoints)

- Sump Pump Discharge / Splash Pad (not discharging over driveway or septic tank / bed)
- Rainwater Leaders / Downspouts and Splash Pads (not discharging to driveway)
- Clearance from Finished Grade to Top of Foundation Wall (0.15m min.)
- Grade Elevation at all Entrances / Walkways / Patios / Decks / Porches
- Grading and Elevations at Retaining Walls (Top of Wall / Bottom of Wall)
- Driveway - % grade / width / curb cut / offset from property line / street furniture
- Driveway Culvert – location / size / length / material / - clear of obstruction
- Municipal Water Service Curb Stop (If existing) NOT located in Driveway
- Location of Private Well and 15.0m Setback to Private Sewage System
- Grades At / Over Private Sewage System – Septic Bed / Holding Tank
- Grate Elevations At / Leading Too Internal Catch Basins / Soak Away Pits
- Sod / Seed / Soil Cover - Rooted / Knitted / Applied Correctly

Prior to a building's superstructure proceeding, the Applicant's P.Eng, OLS or C.E.T. shall certify that the final footing and foundation elevations conform to the ELG Plan Plans and the Ontario Building Code.

Prior to pouring building footings, the Applicant's P.Eng, OLS or C.E.T. shall certify the accurate location of the footing and the foundation in respect to the approved Zoning Certificate.

NOTE 1: Driveway Entrance Culvers shall be installed **prior to Occupancy.**

NOTE 2: The Residential Lot Grading Inspection Checklist is found at the end of this Section

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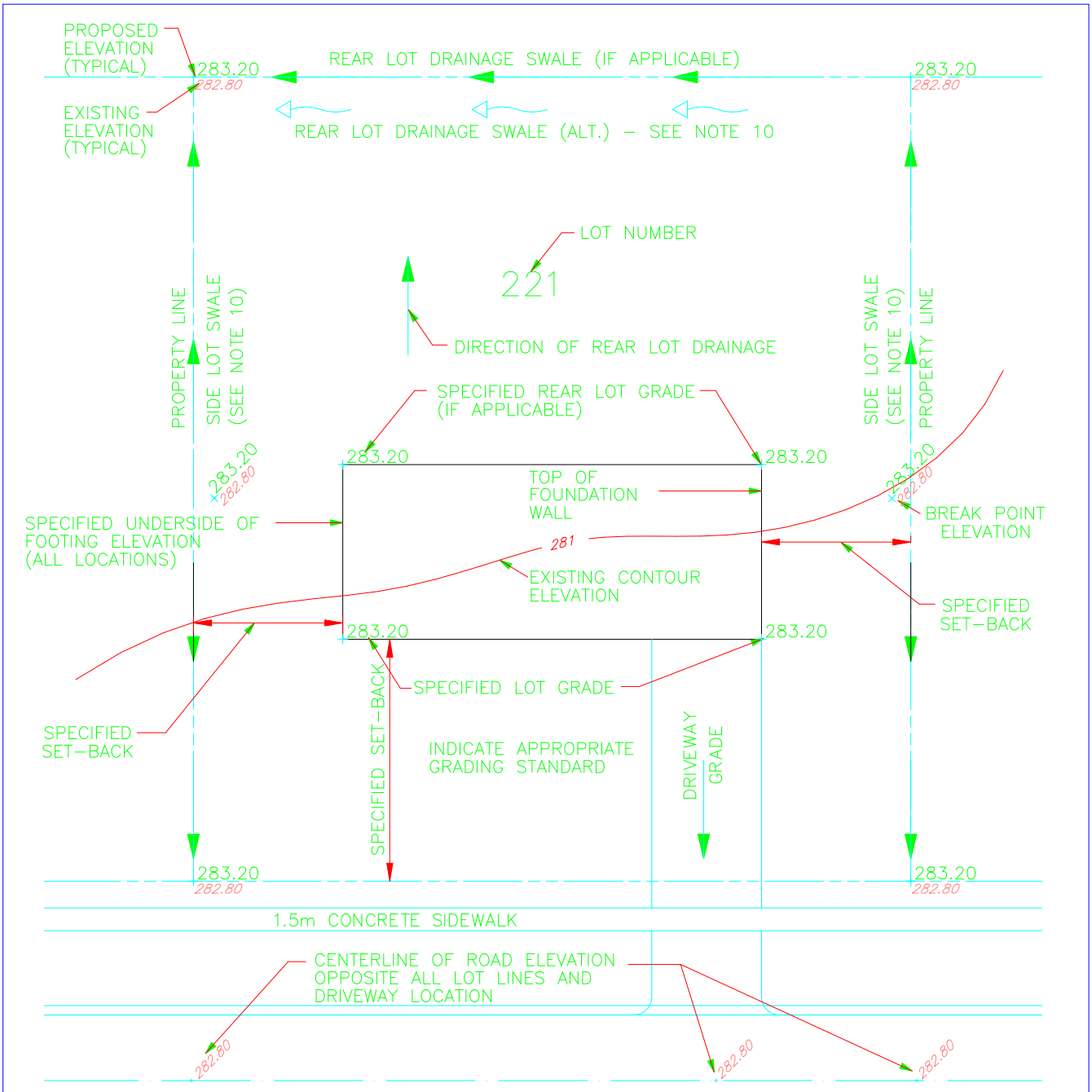


NOTES:

1. ALL CATCHBASIN LOCATIONS MUST BE SHOWN ON GRADING PLAN.
2. ALL EASEMENTS MUST BE SHOWN ON GRADING PLAN.
3. PROVIDE MAIN FLOOR AND BASEMENT ELEVATIONS.
4. SPECIFY PROPOSED GRADES ON SWALES.
5. IDENTIFY PROPOSED LOCATION AND DIMENSION OF SEPTIC TILE BED AND RESERVE BED AREA (WHERE REQUIRED).
6. PROVIDE REGISTERED PLAN NUMBER.
7. MAXIMUM DRIVEWAY GRADE TO BE 7%.
8. SHOW SERVICE LATERAL INVERT ELEVATION AT STREET LINE AND CURB STOP LOCATION (WHEN APPLICABLE)
9. SHOW ALL UTILITY INSTALLATIONS IN BOULEVARD.
10. DRAINAGE SWALES TO BE ON PROPERTY LINE. SET SWALE ENTIRELY WITHIN LOT IF ABUTTING PROPERTY NOT UNDERGOING DEVELOPMENT.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:

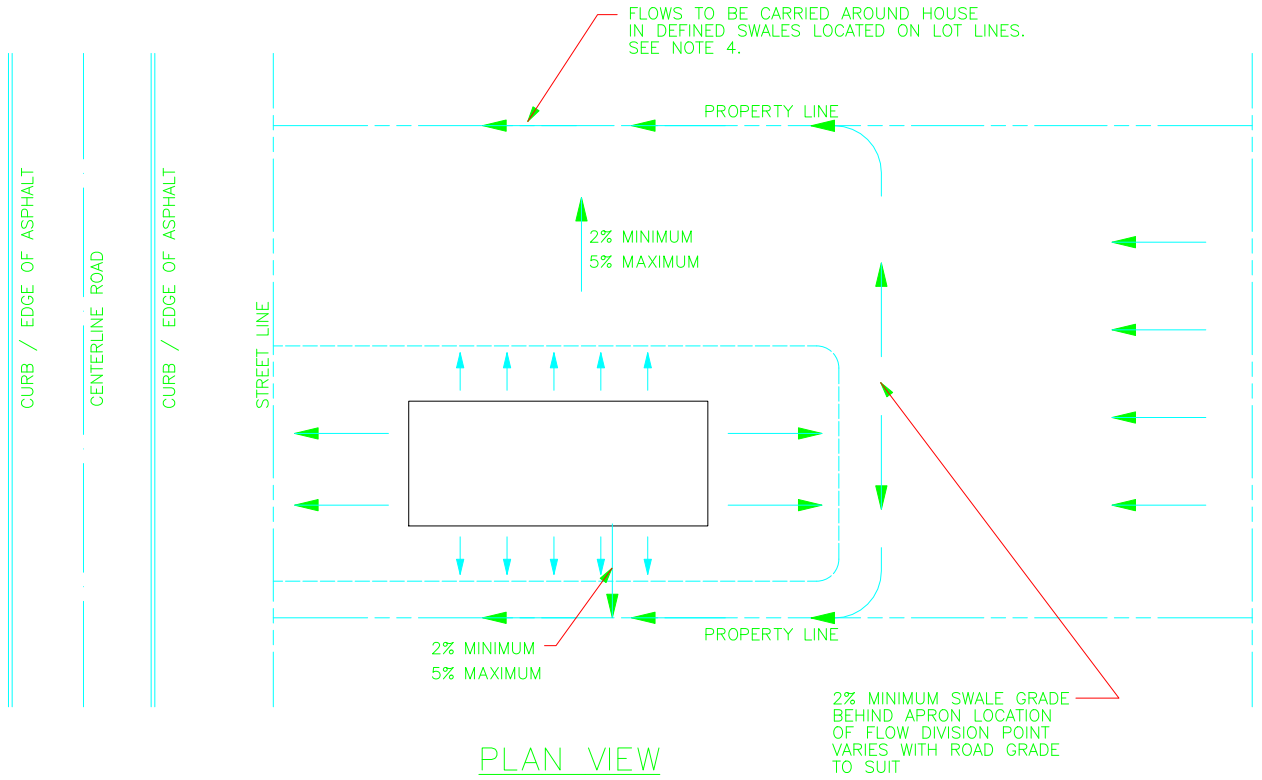
DATE: 03 / 2016

DRAWN:

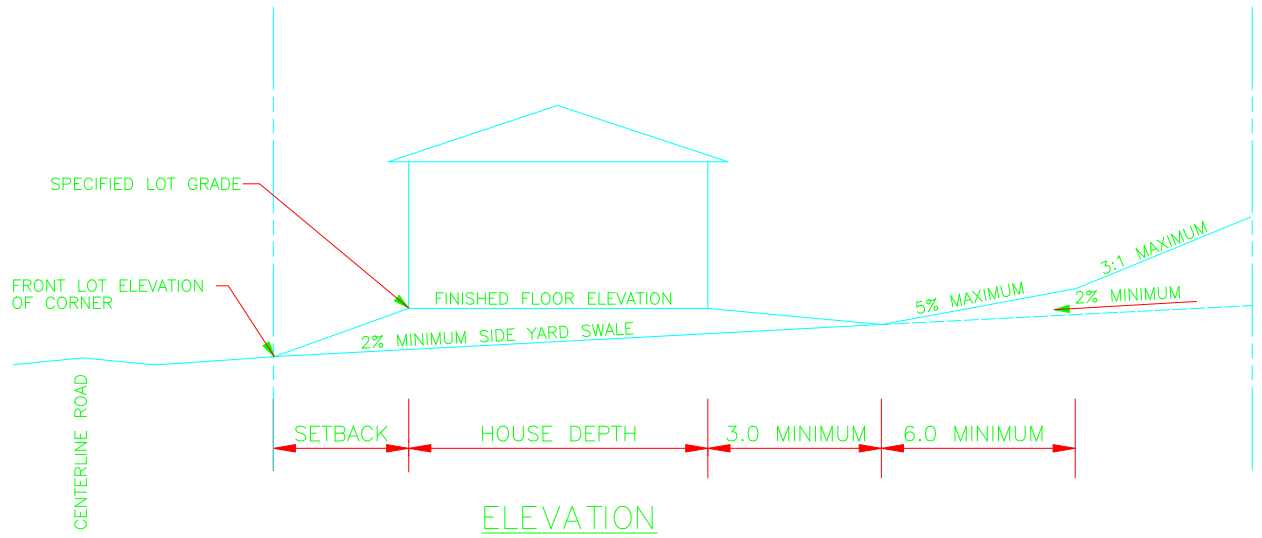
SCALE: NTS

TYPICAL LEGEND FOR LOT GRADING PLAN

STD. No. 3.20–01



PLAN VIEW



ELEVATION

NOTES:

1. SPECIFIED LOT GRADE SHALL BE MINIMUM 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. DRIVEWAYS ARE NOT TO BE USED AS AN OUTLET FOR ANY SIDEYARD SWALE.
3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
4. DRAINAGE SWALES TO BE ON PROPERTY LINE. SET SWALE ENTIRELY WITHIN LOT IF ABUTTING PROPERTY NOT UNDERGOING DEVELOPMENT.

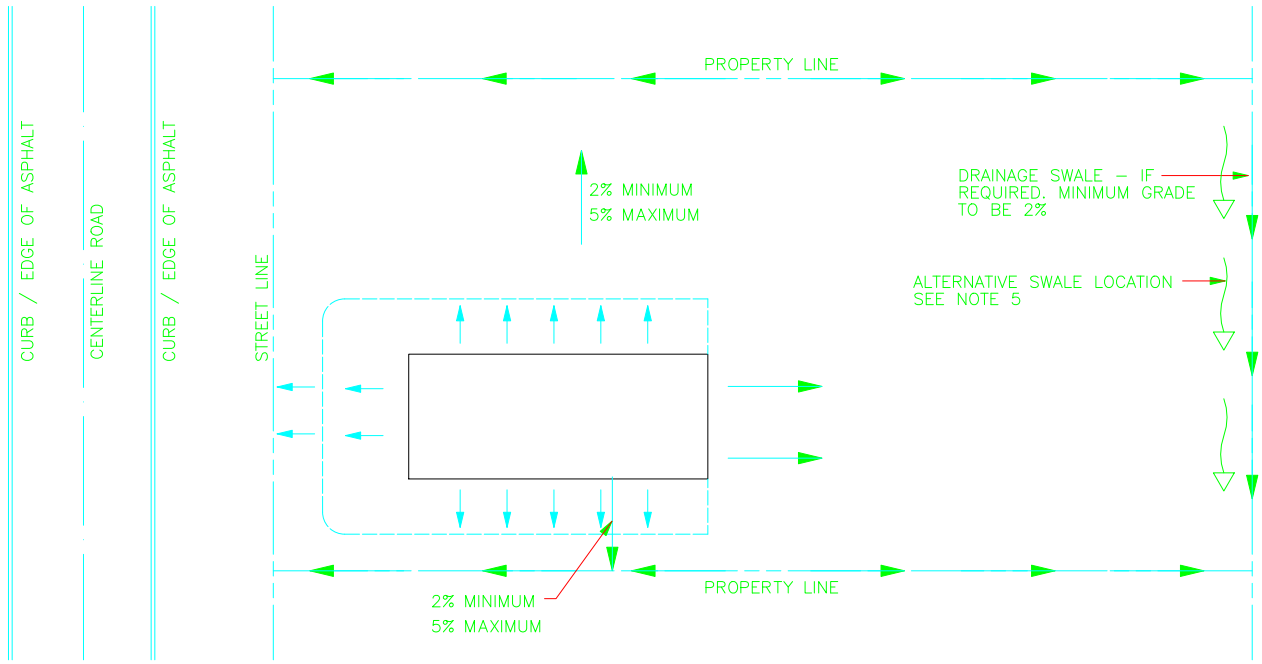
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

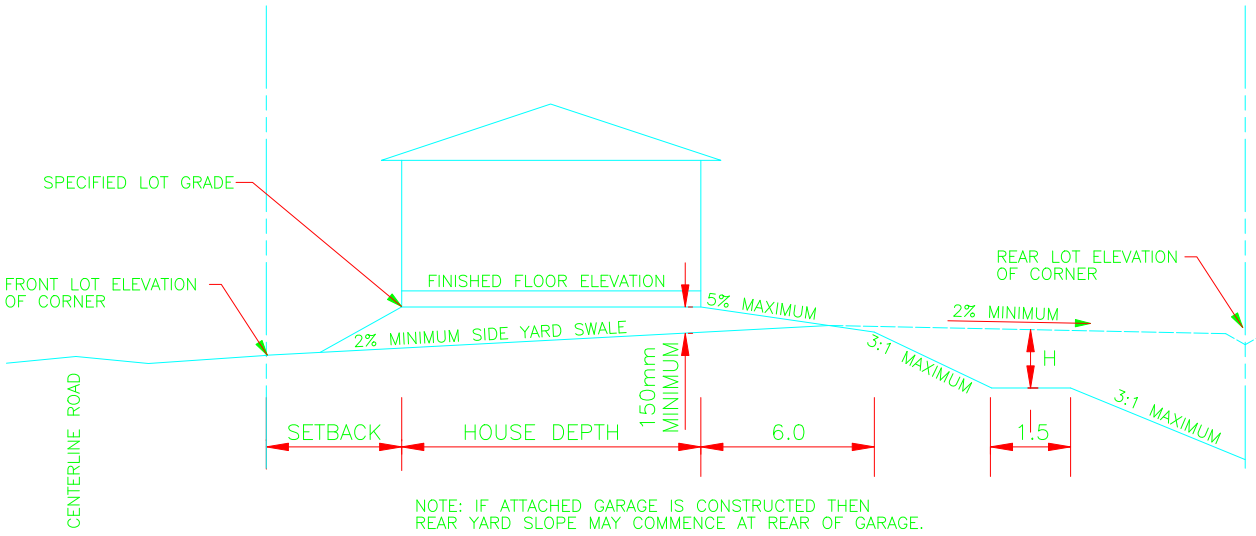
APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

REAR TO FRONT DRAINING LOTS

STD. No. 3.20-02



PLAN VIEW



NOTE: IF ATTACHED GARAGE IS CONSTRUCTED THEN REAR YARD SLOPE MAY COMMENCE AT REAR OF GARAGE.

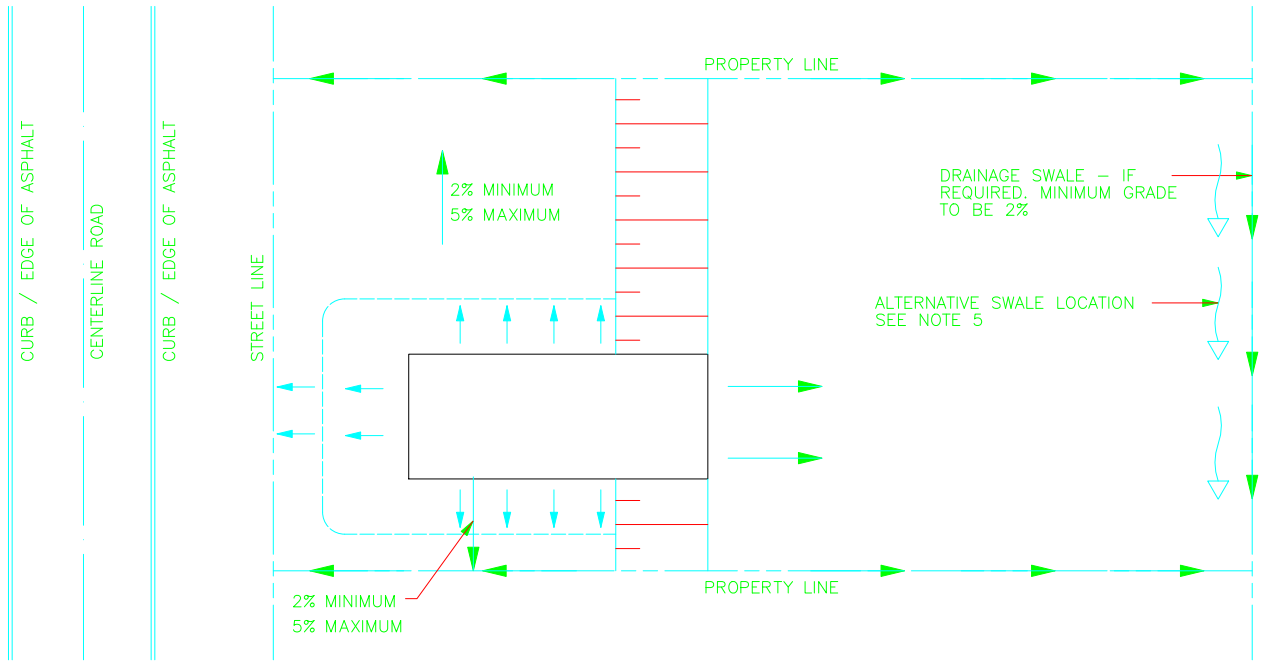
ELEVATION

NOTES:

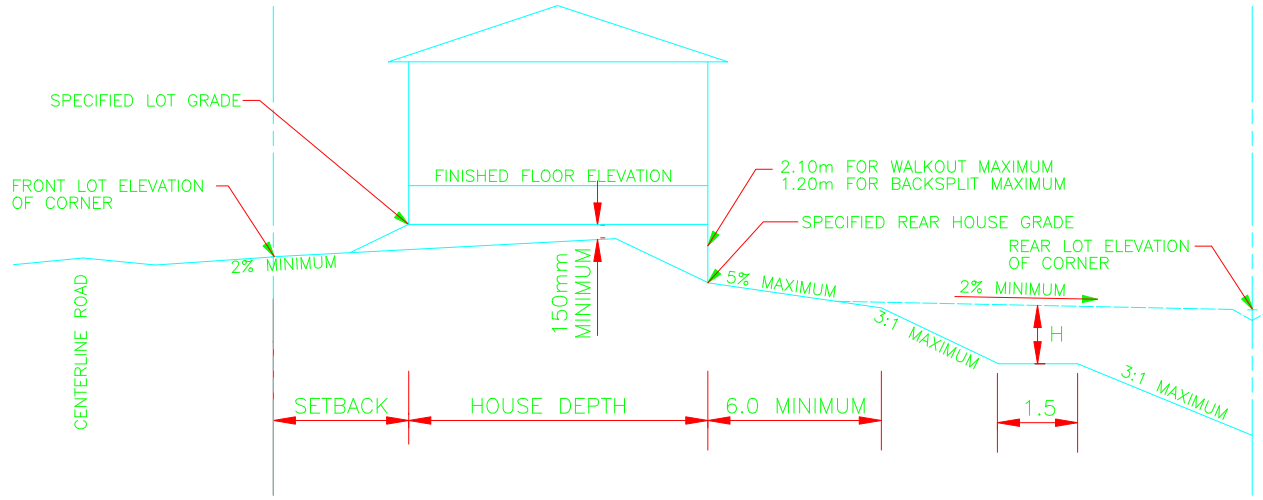
1. SPECIFIED LOT GRADE SHALL BE MINIMUM 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. DRIVEWAYS ARE NOT TO BE USED AS AN OUTLET FOR ANY SIDEYARD SWALE.
3. 'H' DIMENSION TO BE 1.8m MAXIMUM, UNLESS UNDISTURBED EXISTING SLOPE. TERRACE CAN BE ELIMINATED ON SLOPES OF 4:1 OR LESS.
4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
5. DRAINAGE SWALES TO BE ON PROPERTY LINE. SET SWALE ENTIRELY WITHIN LOT IF ABUTTING PROPERTY NOT UNDERGOING DEVELOPMENT.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE		APR'D:	DATE: 03 / 2016
		DRAWN:	SCALE: NTS
SPLIT LOT – REAR DRAINING		STD. No. 3.20–03	



PLAN VIEW



ELEVATION

NOTES:

1. SPECIFIED LOT GRADE SHALL BE MINIMUM 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. 'H' DIMENSION TO BE 1.8m MAXIMUM, UNLESS UNDISTURBED EXISTING SLOPE. TERRACE CAN BE ELIMINATED ON SLOPES OF 4:1 OR LESS.
3. REAR HOUSE GRADE MUST ALSO BE SPECIFIED ON LOT GRADING PLANS WHEN THIS HOUSE TYPE IS PROPOSED.
4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
5. DRAINAGE SWALES TO BE ON PROPERTY LINE. SET SWALE ENTIRELY WITHIN LOT IF ABUTTING PROPERTY NOT UNDERGOING DEVELOPMENT.

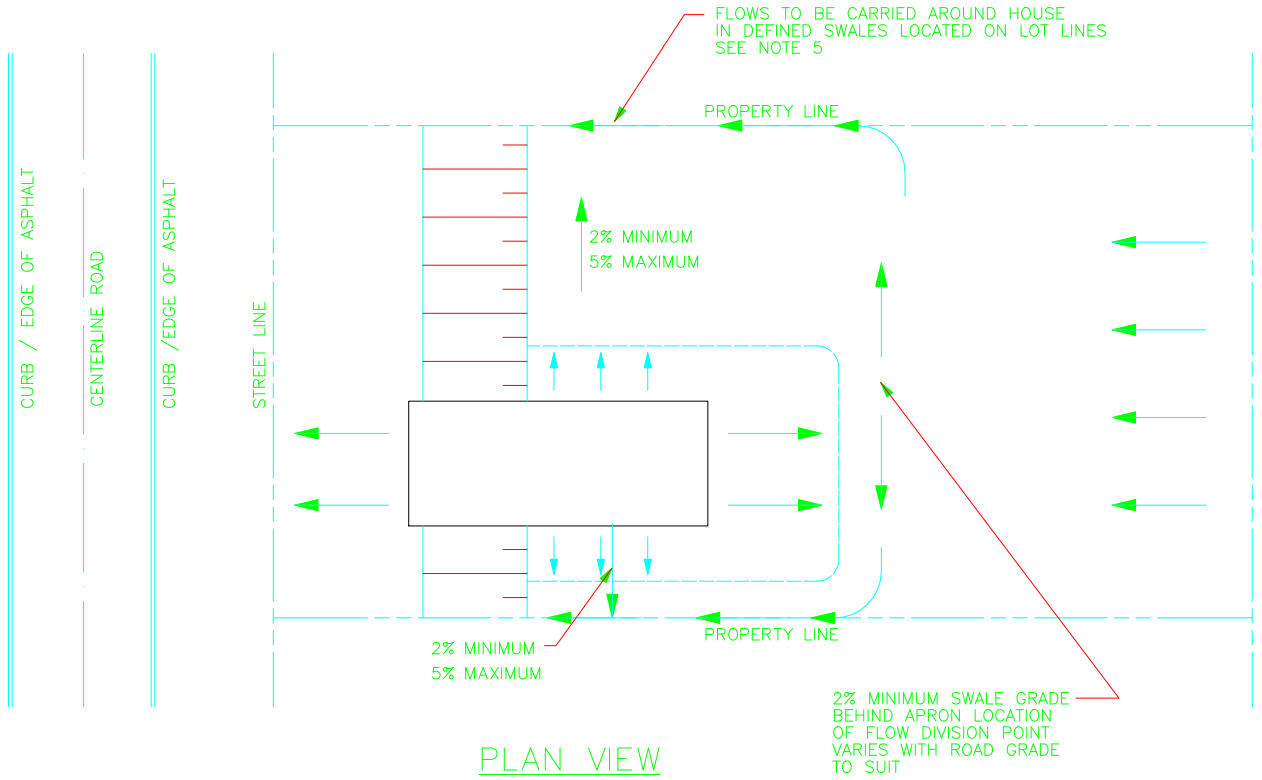
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

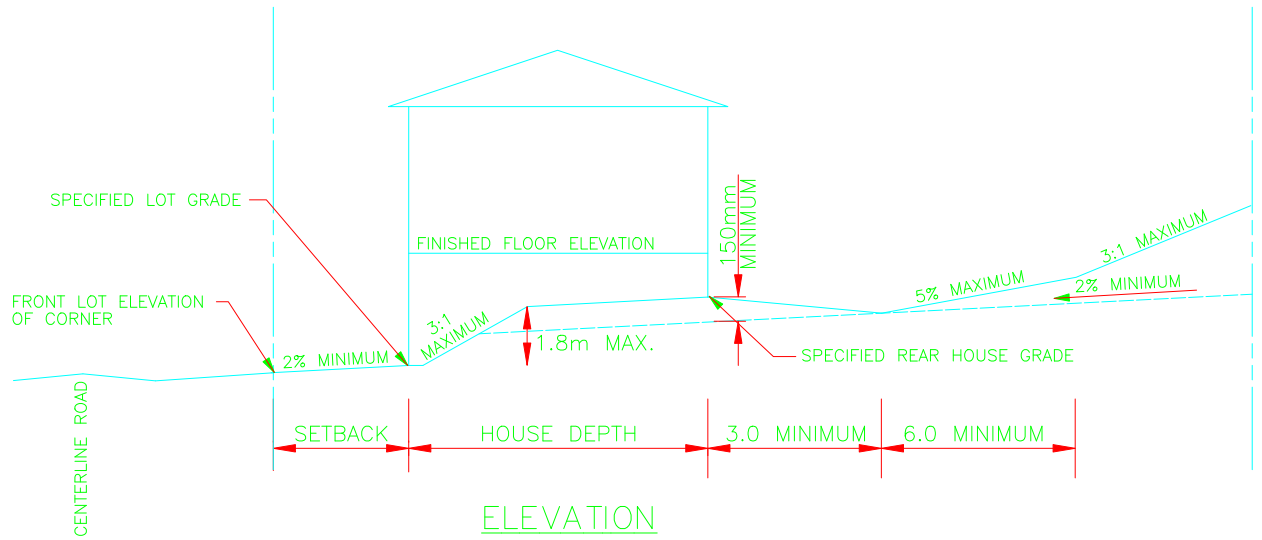
APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

REAR LOT DRAINING –
WALKOUT OR BACK SPLIT HOUSE

STD. No. 3.20–04



PLAN VIEW



ELEVATION

NOTES:

1. SPECIFIED LOT GRADE SHALL BE MINIMUM 0.30m ABOVE HIGHEST FRONT LOT CORNER.
2. DRIVEWAYS ARE NOT TO BE USED AS AN OUTLET FOR ANY SIDEYARD SWALE.
3. REAR HOUSE GRADE MUST BE SPECIFIED ON LOT GRADING PLANS WHEN THIS HOUSE TYPE IS PROPOSED.
4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
5. DRAINAGE SWALES TO BE ON PROPERTY LINE. SET SWALE ENTIRELY WITHIN LOT IF ABUTTING PROPERTY NOT UNDERGOING DEVELOPMENT.

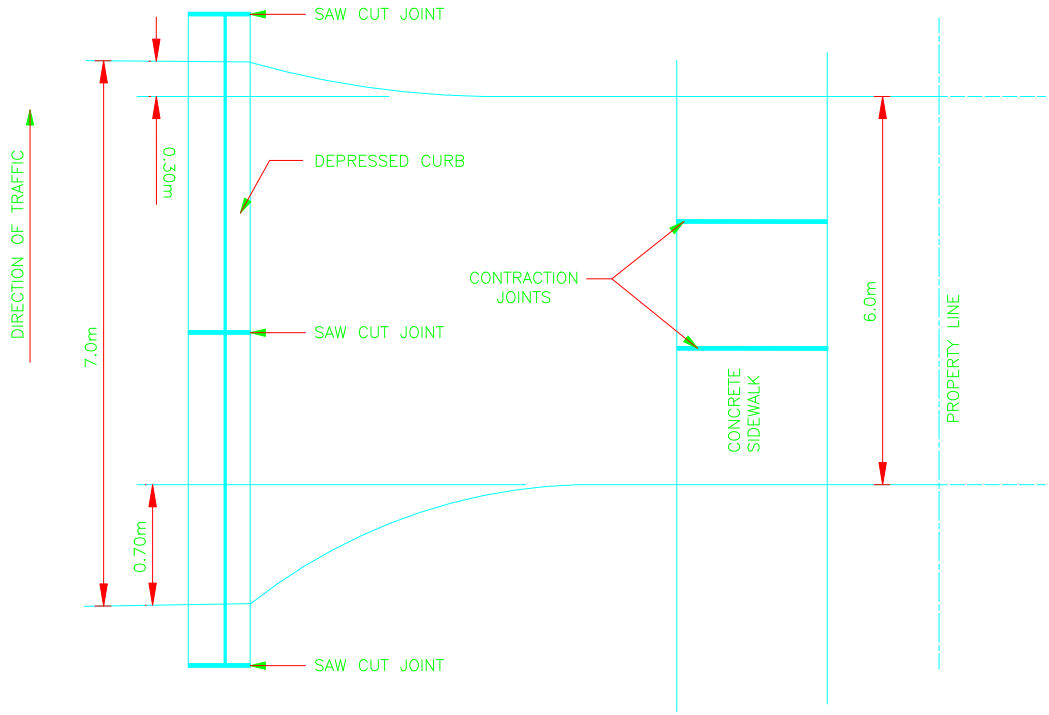
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

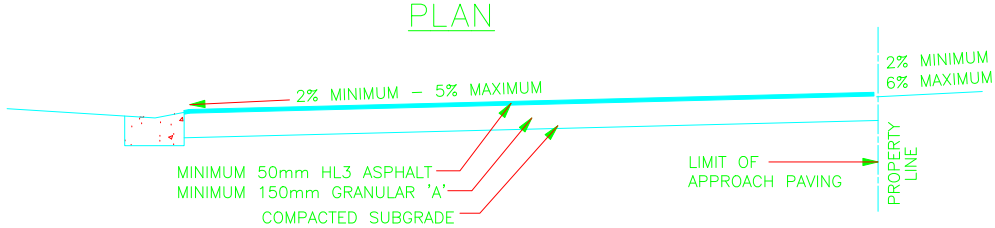
APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

FRONT LOT DRAINING –
FRONT SPLIT HOUSE

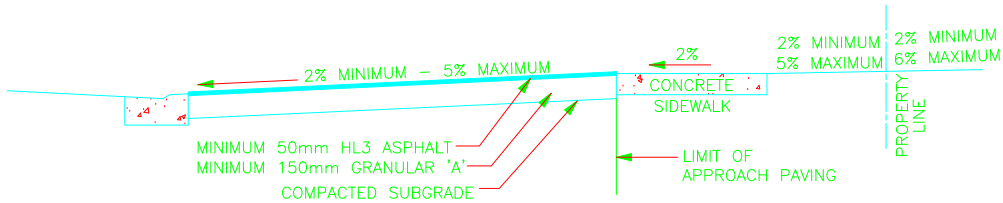
STD. No. 3.20-05



PLAN



TYPICAL SECTION
ON STREETS WITHOUT SIDEWALKS



TYPICAL SECTION
ON STREETS WITH SIDEWALKS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS UNLESS OTHERWISE SPECIFIED.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:

DATE: 03 / 2016

DRAWN:

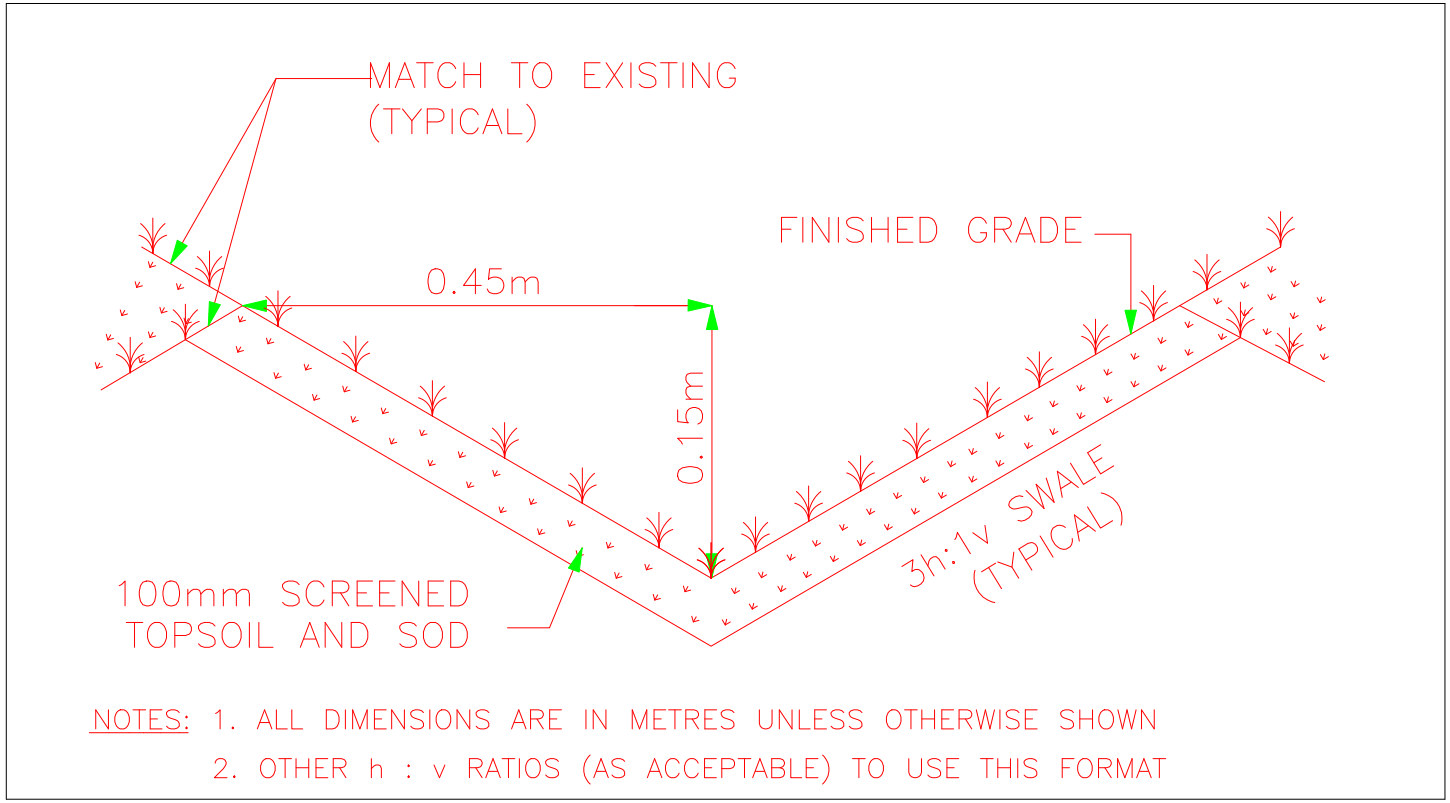
SCALE: NTS

DRIVEWAY APPROACH PAVING – RESIDENTIAL DRIVEWAYS

STD. No. 3.20–06

TYPICAL SWALE DETAIL

N.T.S.



NOTES: 1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN

2. OTHER h : v RATIOS (AS ACCEPTABLE) TO USE THIS FORMAT

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

TYPICAL GRASS SWALE 3h:1v

APR'D:

DRAWN:

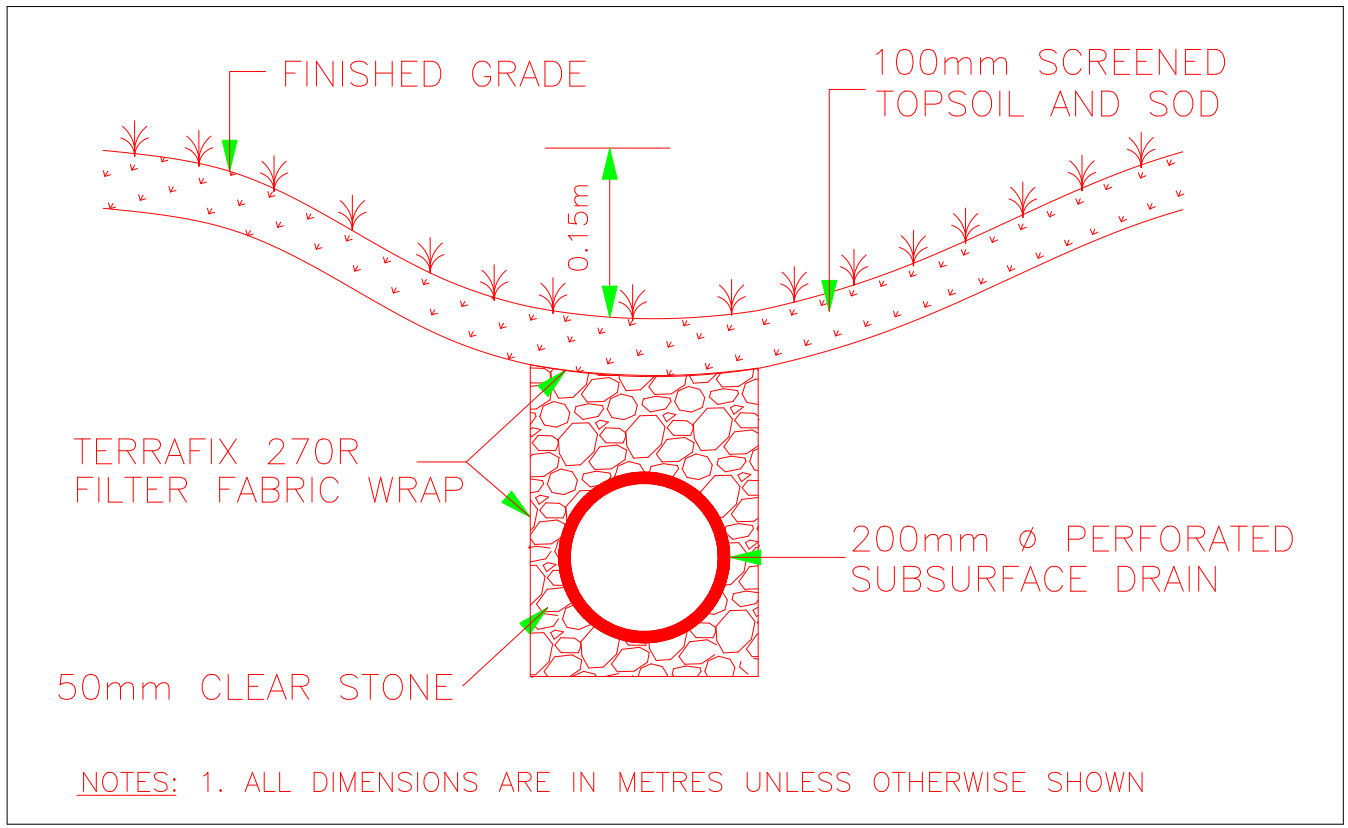
DATE: 01 / 2018

SCALE: NTS

STD. No. 3.20-07

TYPICAL FRENCH DRAIN

N.T.S.



NOTES: 1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE

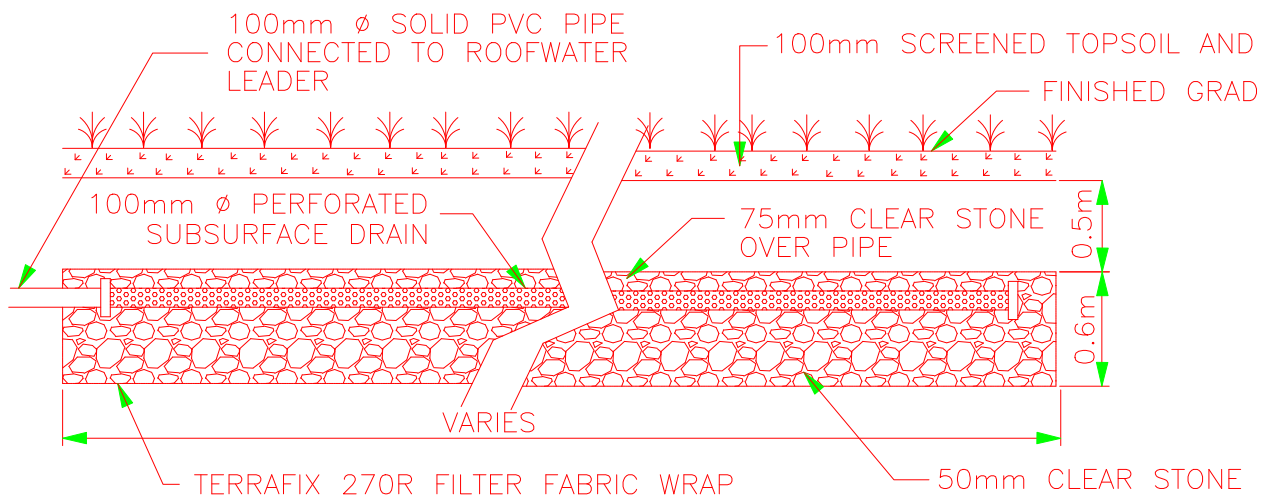
TYPICAL FRENCH DRAIN

APR'D:	DATE: 01 / 2018
DRAWN:	SCALE: NTS

STD. No. 3.20-08

TYPICAL ROOF LEADER SOAK–AWAY PIT

N.T.S.



NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN
2. SOAK–AWAY PITS TO BE PROVIDED ON LOTS AS REQUIRED AND IN CONJUNCTION WITH HOUSE CONSTRUCTION.
3. PIT LOCATATION TO BE A MINIMUM OF 4.0m FROM HOUSE.
4. TYPICAL DIMENSIONS: 0.6m DEEP x VARIED LENGTH

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

TYPIAL ROOF LEADER SOAK–AWAY PIT

APR'D:	DATE: 01 / 2018
DRAWN:	SCALE: NTS

STD. No. 3.20–09

TOWNSHIP OF ORO-MEDONTE
ENGINEERED LOT GRADING DESIGN CHECKLIST

Applicants Name:_____

Contact Information of Designer / Consultant:_____

Lot Info / Municipal Address_____

Submission Date:_____/_____/_____ Submission / Revision #:_____

	Description	Yes	No	N/A
	Signature / Seal of Lot Grading Plan Designer * Notice of Review and Approval by Engineer of Record in accordance with a Subdivision Agreement (if required) *			
	Design Date and Submission #			
	North Arrow and Key Plan			
	Metric Scale of Drawing - of a typical engineering scale			
	Geodetic Benchmark - Location and Elevation			
	Dimensioned Property Limits / Boundaries and Lot Corner Elevations			
	Location and Typical Detail of Silt and Sediment Control Measures			
	Typical Swale Cross Section(s) – Side yard, Mid-yard and Cut-off (as req'd)			
	Location, Elevation, Flow Direction and % Grade of all Swales			
	Location of Engineered Fill			
	Location of Environmentally Protected Areas / Waterbodies / Shoreline			
	Location of Existing Trees to be Retained			
	Top and Bottom of Slope / Topographic Detail (For Septic Location - As Necessary)			
	Location and Type of all Utility Services (Natural Gas, Bell, Hydro and Cable T.V., etc)			
	Location of Municipal Water Service OR			
	Location of Private Well and 15.0m Setback Radius			
	Location of Municipal Sanitary Sewer Service OR			
	Location of Private Sewage System – Septic Bed, Tank and Grade Elevations			
	Location and Dimensions of Municipal or Utility or Drainage Maintenance Easements			
	Driveway - location, proposed % grade, width and curb cut locations			
	Driveway Culvert – location, size, length, material, elevations and % grade			
	Elevations of Road Grade (edge of road and centre line) adjacent to all Lot Lines			
	Elevations of and % grade of Road Side Ditches adjacent to all Lot Lines			
	Street Furniture – Hydrants, Streetlights, Bell / Cable Hydro Pedestals / Poles, etc.			
	Building(s) Location - Lot Line Setback Distances and Building Grade Elevations			
	House Type / Lot Type e.g.: Walk-out Basement / Split Lot			
	Location of Internal Catch Basins / Soak Away Pits inc. Grate and Invert Elevations			
	Location of Sump Pump discharge (not discharging to driveway or over septic tank)			
	Location of all Rainwater Leaders / Downspouts (not discharging to driveway)			
	Finished First Floor elevation (F.F.F.)			
	Top of Foundation Wall elevation (T.F.W.)			
	Finished Basement Floor elevation (F.B.F.)			
	Underside of Footings elevation (U.S.F.)			
	Finished Garage Floor elevation (F.G.F.)			
	Underside of Footings Garage elevation (U.S.F.G.)			
	Location and Elevation of all Entrances including # of Risers			
	Location and Elevation of all Walkways, Patios, Deck and Porches			
	Location and Elevation of Retaining Walls (Top of Wall and @ Grade)			

TOWNSHIP OF ORO-MEDONTE

ENGINEERED LOT GRADING INSPECTION CHECKLIST

Contact Information of Designer / Consultant:_____

Lot Info / Municipal Address_____

Inspection Date: _____/_____/_____ **Inspection #:**_____

Description	Satisfactory / Complete - Circle As Appropriate
Letter of Certification complete with Signature / Seal of Lot Grading Plan Designer	Y N NA
Approved E.L.G. Drawing included with Letter - Design Date and Submission #	Y N NA
Swale Locations - Side Yard / Cut-off / Rear Yard	Y N NA
Swale Depths - 0.15m min. / 3:1 max. side slopes	Y N NA
Swale Grades - % Slope and Running Direction	Y N NA
Max. Grading Difference @ 3:1	Y N NA
Match Grades to All Adjacent Lot Lines	Y N NA
Grades at Setbacks to Tree Protection / Naturalized / Environmental / Water Body / Shoreline	Y N NA
Grades Matching Road Grade Adjacent to Lot Lines	Y N NA
Grades Matching Road Side Ditches Adjacent to Lot Lines	Y N NA
Grades / Swales Account for Street Furniture / R.O.W. Feature Locations	Y N NA
Grades of Municipal or Utility or Drainage Maintenance Easements	Y N NA
Building Corner Grade Elevations (inc. Breakpoints)	Y N NA
Sump Pump Discharge and Splash Pad (not discharging to driveway or over septic tank)	Y N NA
Rainwater Leaders / Downspouts and Splash Pads (not discharging to driveway)	Y N NA
Clearance from Finished Grade to Top of Foundation Wall (0.15m min.)	Y N NA
Grade Elevation at all Entrances / Walkways / Patios / Decks / Porches	Y N NA
Grading and Elevations at Retaining Walls (Top of Wall / Bottom of Wall)	Y N NA
Driveway - % grade / width / curb cut / offset from property line / street furniture	Y N NA
Driveway Culvert – location / size / length / material / clear of obstruction and able to flow	Y N NA
Municipal Water Service Curb Stop (If existing) NOT located in Driveway	Y N NA
Location of Private Well and 15.0m Setback to Private Sewage System	Y N NA
Grades and Sod / Seed / Soil Cover Over Private Sewage System (Septic Bed / Holding Tank)	Y N NA
Grate Elevations At / Leading Too Internal Catch Basins / Soak Away Pits	Y N NA
Sod / Seed / Soil Cover - Rooted / Knitted / Applied Correctly Over All Yard / Amenity Areas	Y N NA

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3.21 Industrial / Commercial / Institutional Site Plan Design

3.21.1 Site Plan Agreement

The Developer of lands under Site Plan Control, as specified in the Township's Official Plan and Site Plan Bylaw, may be required to enter into a "Site Plan Agreement" with the Township prior to the commencement of construction of any building or service within the parcel of land. For **all** proposed site plan developments, the Developer shall secure site plan approval from the Township.

The Township is also responsible for the collection of revenue for water consumption and therefore the "metering" arrangement for the subject property shall be approved by the Township.

3.21.2 Submission and Site Inspection Requirements

The Developer shall retain a qualified Professional Engineer (Developer's Consulting Engineer) to prepare **all** engineering drawings and to supervise the construction of **all** engineering services (municipal or private water and sanitary services, grading and stormwater management works, roadwork within a ROW and retaining walls).

The Developer's Consulting Engineer shall act as the Developer's representative in **all** matters pertaining to the design and construction of the services in the development.

The Developer's Consulting Engineer shall be required to submit a Retainer Letter to the Township in the format included in these criteria outlining their duties and responsibilities.

The Developer's Consulting Engineer **shall deal directly with other commenting Authorities**, (i.e. County of Simcoe, Ministry of the Environment Conservation and Parks, Ministry of Northern Development, Mines, Natural Resources and Forestry, Department of Fisheries and Oceans, Ministry of Transportation, County of Simcoe, Lake Simcoe Region Conservation Authority, Nottawasaga Region Conservation Authority, etc.) for works that fall within their respective jurisdictions.

Depending on the complexity of the proposed development, requirements of the above noted drawings may be combined, or waived, at the discretion of the Township. Additional Site Plan drawings shall be prepared when requested by the Township. Prior to receiving a building permit, **all** plans shall be approved by the Township.

Supporting documents required as follows; Stormwater Management Report, Traffic Impact Study, Functional Servicing Report, Noise Attenuation Report, Hydrogeological Report, Floodplain Study, Environmental Impact Study, Natural Heritage Evaluation, Photometrics Plan and Archaeological Impact Study.

Should the site be located in an unassumed subdivision then the Developer's Consulting Engineer may be required to review and approve the Site Plan and Stormwater Management Report prior to Proponent's Site Plan submission to the Township. The Developer's Consulting Engineer shall certify that the site grading conforms to the approved Grade Control Plan, the overland flow route is maintained and that the allowable storm water release rate is not exceeded.

3.21.3 Drawing and Design Requirements

Drawings showing grading and the location, size, grade, invert elevations, material, and bedding requirements for **all** storm, sanitary and watermain service connections shall be prepared and submitted to the Township for approval. Engineering drawings shall also be prepared for **all** sanitary and storm sewers and watermain that are required to be constructed within road allowances or registered easements to service the subject property. These drawings are to be prepared to the Township requirements.

In each instance, the following Drawing Sets, Reports and Studies, and supporting calculations shall be required in digital form by way of a Township accepted electronic submission method:

Site Plan Drawing Sets, Reports and Studies:

- Site Servicing Plan *
- Site Grading and Drainage Plan * *
- Erosion and Sedimentation Control Plan * *

- Standard Detail Sheet
- Geotechnical Report
- Engineering Cost Estimate
- Architectural Elevations
- Electrical and Site Photometric Plan (As Required)
- Landscape Plan (As Required)
- Traffic Analysis (As Required)

Depending on complexity of the Site and Design Requirements:

1. **Site Servicing Plans may include entrance and pavement details, fire routes, turning movements and other elements provided all of the design details are legible.**

2. **Site Grading and Drainage and Erosion and Sediment Control Plans may be condensed into one (1) drawing provided all design details are legible.**

All Site Plan Drawings shall be prepared from one base plan prepared at a minimum scale of 1:500 and which shall contain some or **all** the following information:

- Stamp and Signature of the Developer's Consulting Engineer
- Municipal Address, Lot Numbers, and Registered Plan numbers
- A key plan at a scale of 1:10,000 showing the site location
- A North Arrow
- Details for the referenced Geodetic Benchmark used to establish vertical control and the site benchmarks for construction
- Site statistics
- Property dimensions
- Road widenings and Restoration Notes
- Easements
- Vehicular loading and parking facilities
- The outline of **all** buildings with the building numbers and unit numbers indicated and garage locations within the unit
- Storage areas and enclosures for garbage and waste materials
- Fire routes, truck delivery and other large vehicle drive paths

- Location of Siamese Connections and/or Standpipes
- Sidewalks, Walkways and Ramps
- Proposed roadways / driveways and **all** points of access
- Sufficient detail on adjacent lands to ensure their protection
- Existing land features (trees, watercourses, roads, services, etc.)

In addition to the information above: Site Plan, Site Grading Plan, Site Services Plan, Drainage Area Plan, Elevation Plan, Erosion and Sedimentation Control Plan, Landscape Plan, Geotechnical Report, Traffic Analysis and Engineering Cost Estimate shall require specific details described below.

3.21.4 Site Servicing Plan and Design

The Site Services Plan shall show, at a minimum, the location, size, and grade (as applicable) of the following services and information:

- **all** existing underground services on roads / easements adjacent to the property
- storm and sanitary service connections with grade and invert information
- the basement and finished floor elevations of **all** proposed buildings
- storm, sanitary and watermain services with length, grade, material, and bedding requirements to be constructed within the development
- proposed sanitary and storm maintenance holes with invert and rim elevations
- hydrants, valves, and water meters within the development
- sanitary, storm and water service connections to individual units, as applicable
- roof water leaders and method of discharge
- adequate snow storage volume(s) and location(s)
- driveway location(s) / traffic flow directions
- Fire Route Location / Pavement Standard and Adequate Turning Radii
- **all** construction notes required to describe the construction detail or requirements
- the locations of prime and reserve tile-beds, including mantles (where required)
- proposed wells and septic beds to be decommissioned;
- illumination standards / description and photometric plan
- proposed landscape features

NOTE 1: Driveways shall be set back a min. of 3.0 m from any tree or above ground Utility device (hydrants, hydro vaults, light standards, etc.).

NOTE 2: **All** watermain shall be designed and constructed in accordance with the requirements of the Ontario Plumbing Code, N.F.P.A. 24 and Township Standards. The watermain design shall be submitted to the Township of Oro-Medonte Fire Department for approval of the watermain layout and the hydrant locations. The provisions of the Ontario Water Resources Act may apply to the watermain works.

NOTE 3: **All** sanitary sewers shall be designed in accordance with the requirements of the Ontario Building Code and Township Design Criteria. The Ontario Water Resources Act, R.S.O., 1990, provisions may apply to sanitary and storm sewer works.

3.21.5 Stormwater Management

All storm sewers shall be designed in accordance with the requirements of the Ontario Building Code and the Township Design Criteria. The provisions of the Ontario Water Resources Act, R.S.O., 1990, may apply to sanitary and storm sewer works. Stormwater management techniques shall be employed on **all** sites in accordance with requirements identified in this document.

All storm sewers shall be located within the limits of the roadway.

All storm sewer connections shall be sized according to the requirements of the Ontario Building Code (OBC) and shall be installed on a minimum grade of 2.0%.

Oil / Grit Separator Chambers are to be used to augment other measures for water quality treatment and are mandatory on sites. Oil / Grit Separator Chambers shall be placed in large parking areas, located adjacent to all fuelling areas, located where there is to be fuel and chemical storage location(s) or where there is to be a stormwater discharge within 30 metres of a watercourse.

The rainwater leaders from **all** commercial, industrial, institutional, and high-density residential buildings shall be discharged onto grassed or landscaped areas. Alternatively, rainwater leaders may be directed to on-site detention facilities to achieve the necessary stormwater quantity control as calculated in the stormwater management report.

- Yard catch basins shall be provided where required for landscaped area drainage
- Catch basin maintenance holes may be used for roadway drainage
- Where requested, easements for utilities shall be provided at no cost to the utility company
- Roof-top flow restriction devices shall **not** be permitted **unless** the approved structural design allows for them to be installed

As a guideline, the degree of control on the quantity of run-off from a proposed development shall be:

- The post-development peak flow shall not be greater than the corresponding pre-development peak flow for the 1 : 5 year, 1 : 10 year, 1 : 25 year and 1 : 100 year storms. (Other regulatory agencies may require other storm flows to be analyzed)

Where on site stormwater quantity controls are required, a stormwater management report addressing the points listed below shall be submitted:

- a control device (orifice) shall have a diameter of no less than 75 mm in order to prevent clogging of the opening
- control devices shall be installed on the upstream side of the maintenance hole
- storm connections from the building roof and foundation drains shall be made downstream of the maintenance hole and/or catch basin inlet controls
- ponding limits and available storage are to be depicted on the site servicing drawings and maximum ponding depth in parking areas is not to exceed 200 mm
- an overland flow route shall be clearly marked. The grading of parking lots and landscaped areas shall provide a safe overland flow route to the surrounding Township right of way during storms exceeding the design storm event
- roof drains can be utilized with controlled discharge

- details and concepts are to conform to the Urban Drainage Design Guidelines, set out by the MECP
- on-site stormwater management facilities may require Environmental Compliance Approval from the MECP. One completed MECP Application form is to be submitted to the Township signed by the Developer and the Developer's Consulting Engineer, in accordance with MECP requirements.

3.21.6 Site Grading Design

The site grading plan shall show, as a minimum, the following information:

- The drainage of the site is to be self-contained.
- Site grading shall be compatible with elevations of adjoining / abutting lands.
- **All** grassed embankments shall have a maximum slope of 3:1.
- The grade of grassed or other landscaped areas shall have a maximum slope of 7% and a minimum slope of 2%.
- Swales on grassed areas shall have a minimum slope of 2% and a maximum slope such that the flow velocity for contained does not exceed 1.25 m. / second.
- The maximum suggested length for any drainage swale is 75 m.
- The minimum depth for any drainage swale shall be 150 mm. @ 3:1
- The maximum depth for any drainage swale shall be 750 mm @ 5:1
- The maximum side slope on any drainage swale shall be 3:1.
- **All** driveways shall have positive drainage from the property line to the roadway.
- Centreline grades at 15 m intervals along **all** existing roads bounding the property and existing grades.
- A legend indicating which are existing and which are to be proposed elevations.
- Contours at maximum 0.5 m intervals to indicate the existing elevations of the site. Contours are to extend to a minimum distance of 15 m beyond the property limits to indicate the grading and drainage patterns of the adjacent lands.
- Cross sections as required to clarify the proposed grading, particularly in relation to adjacent lands.

- Proposed elevations on paved areas, around proposed buildings, along swales, along roadways, parking areas, driveways, catch basin rim elevations, and **all** other elevations necessary to establish the grading and drainage patterns for the development. Arrows to be used to indicate direction of the surface drainage.
- Road cross sections indicating the pavement and granular base design.
- Roadway dimensions and curb radii.
- Concrete curbs and Curb depressions, with dimensions.
- Embankments, retaining walls, stairs, sidewalks / walkways, and ramps, etc.

3.21.7 Roadway Design

- **All** roadways, driveways and internal fire routes shall be required to satisfy Fire Access Route Design as per OBC 3.2.5.6 and designed in accordance with the most recent engineering requirements of the Township.
- Minimum pavement design for **all** roadways, driveways, and internal fire routes (as required) shall be:
    - subgrade compacted to 95% Standard Proctor Density
    - 450 mm. compacted depth of Granular “B”
    - 150 mm. compacted depth of Granular “A”
    - 50 mm. compacted depth of HL4 Asphalt base course
    - 40 mm. compacted depth of HL3 Asphalt surface course
- Minimum width of a roadway for two-way traffic with no on-street parking shall be 9.0 m from E/P to E/P.
- **All** roadways serving multiple-family projects shall be designed to facilitate passage of emergency and service vehicles. Curb returns having an 8.0 m. radius and inside bends having at least a 12.0 m radius are required. On No Exit roads, provision shall be provided for vehicle turning – turning bulb preferred.
- The grade for any roadway shall be 0.5% min. and 6% max.
- The minimum grade for any driveway shall be 2% within the right-of-way and 2% on private property. The maximum grade shall be 7.0%. The maximum grade shall be used only when necessary due to site conditions.

- The following minimum sight distances maintained (in both directions) for driveway entrances shall be:

Posted Speed Limit km/h	**Minimum Sight Distance** metres
50	135
60	170
70	200
80	230

3.21.8 Landscaping Requirements

- A Landscaping Plan shall be prepared by a qualified Landscape Architect if required by the Township. The Developer may request jointly obtaining a Landscape Architect with the Township (costs shall be borne by the Developer).
- The Landscape Plan shall show **all** landscaping details as required by the Site Plan Agreement. A schedule of plant species and sizes is to be identified on the Landscape Plan.
- **All** maintenance holes, catch basins, hydrants, valves, streetlights, and other servicing features that appear above grade shall also be shown on the Landscape Plan.

3.21.9 Site Lighting

Parking lot and entrance way illuminance shall be L.E.D. and designed as outlined in the **American National Standard Practise for Roadway Lighting ANSI/IES** and **RP-8-14 (2014)** or latest edition is to be used as a guideline.

All on-site exterior lighting shall be directed downward and internal to the site and shall in and be in accordance with “Dark Sky Friendly” lighting design. Designs shall show that fixtures have no up-light focus. Fixtures shall be designed in such a way that there is a minimum horizontal and “zero” vertical lighting focus. No light from the site shall cast onto adjoining properties and in no way impinge on adjacent properties unless otherwise approved.

The photometrics of fixtures shall be submitted for review with preliminary design submissions of development plans and lighting poles and fixtures shall appear in a Note on the drawings.

3.21.10 Construction Notice

A minimum of forty-eight (48) hours prior to commencing construction within the municipal right of way, the contractor shall contact the Township.

3.21.11 Driveways and Parking Areas / Lots

If granular surfaces are allowed, the Construction Notes shall include the following:

"The granular parking area shall be maintained with a stable surface, which is treated so as to prevent the raising of dust or loose particles."

- **All** driveways and internal fire routes shall be required to satisfy Fire Access Route Design as per OBC 3.2.5.6 and designed in accordance with the most recent engineering requirements of the Township.
- **Minimum** pavement design for **all** driveways and internal fire routes (as required) shall be:
  - subgrade compacted to 95% Standard Proctor Density
  - 300 mm. compacted depth of Granular "B"
  - 150 mm. compacted depth of Granular "A"
  - 50 mm. compacted depth of HL8 Asphalt base course
  - 40 mm. compacted depth of HL3 Asphalt surface course

Refer to Dwg. 3.21-01 for Entrance Details

- All Industrial / Commercial / Institutional and Multi-Residential (Apartments) driveway entrances shall have:
  - Minimum Driveway Width of 9.0 m
  - Maximum Driveway Width of 12.0 m
- Driveway entrances shall be designed to accommodate the anticipated vehicular traffic without causing undue interference with the traffic flow on the road. The minimum width of a driveway depression for commercial, apartment or industrial driveways shall be 12.0 metres for a 9.0m driveway width.

- Where driveway entrances are constructed at / over open ditches, a 450 mm diameter Corrugated Steel Pipe (CSP) culvert with a bearing capacity of a minimum of 320 kpa shall be installed. The culvert shall be of sufficient length to span the entrance width and provide additional length and sufficient cover shall be provided to ensure degradation of the entrance does not occur.
- Driveway entrances shall be situated such that there is a minimum of 3.0 m offset from any side yard property line and a minimum setback of 3.0 m from all utility boxes, utility poles or other 'street furniture'.
- Upon Final Inspection and Approval of the Site Plan works, the owner of the property for which the Site Plan was developed shall be responsible or the maintenance and replacement of the driveway entrance culvert(s).
- **All** parking areas shall be paved with asphalt or similar hard surface, unless otherwise prescribed by Township staff in writing. No granular parking areas shall be allowed within an Urban Settlement Area.
- Parking Stall Sizing shall be: Standard: 3.0m in width by 6.0m in length

  Barrier Free: 4.6m in width by 5.5m in length
  with a 1.75m wide delineated side aisle

3.21.12 Traffic Analysis

Consideration shall be given to the impact a site plan may have on the existing traffic and the introduction of new traffic from the site on the adjacent road system. The Township, MTO or the County of Simcoe may request that a traffic impact study be undertaken.

3.21.13 Erosion and Sediment Control

All erosion and sediment shall be minimised and controlled in accordance with the latest requirements of the Township of Oro-Medonte and such that **no** silt shall be permitted to leave the site or into / onto any waterway, wetland or environmentally significant land that crosses or is adjacent to the site. Silt Fence shall be erected, at a minimum unless otherwise Noted or directed, along the property limits. Mud pads shall be required at construction access points to limit the amount of silt and dirt onto the roadway.

3.21.14 Utility Co-ordination

It shall be the responsibility of the Developers Consulting Engineer to follow up with the utility to ensure there is sufficient infrastructure in place to service the site.

The Developer shall also be responsible to undertake utility locates prior to construction. Conflicts with proposed works, damage during construction to utilities or any public infrastructure is the responsibility of the Developer / Applicant and the cost of **all** repairs shall be borne by the Developer.

3.21.15 Road Occupancy Permit

A Permit for Installation / Relocation of Public Utilities shall be obtained and the Township or County of Simcoe or Ministry of Transportation. The Township is to be notified forty-eight (48) hours in advance of the commencement of any construction within the Township's municipal right of way. These works include, but are not limited to, curb cuts, culvert installation, service connection and utility installation. **All** works are to be done at the Developer's expense.

The Developer shall apply for a Driveway Entrance Permit (if an existing permitted entrance does not exist) and install the culvert to Township Standards or better.

If it is determined by the Township that the Developer's Contractor is to install an Entrance Culvert, then a Road Occupancy Permit is required by the Developer on behalf of their Contractor.

The Developer shall restore **all** disturbed areas within the municipal right of way to original or better conditions in accordance with the Road Occupancy Permit or otherwise approved on the Site Plan and to the satisfaction of the Township.

It shall be the responsibility of the Developer to ensure that **all** street furniture is not damaged during construction and, at the Developer's cost, **all** such infrastructure is moved (if required) and adjusted to the proposed grade upon completion.

No planting, berming, landscaping shall be permitted within the Right-of-Way **unless** otherwise approved.

It shall be the Developer's responsibility to ensure that **all** mud or material, which is tracked onto the road, is removed immediately. Should the roads not be kept free and clear of mud and debris it shall be cleaned, without notice by Township forces at the owner's expense.

NOTE: The I.C.I. Site Servicing and Grading Design Checklist is found at the end of this Section

3.21.16 As-Constructed Drawings

After **all** construction is complete, the design drawings shall be amended to incorporate the changes and alterations made during construction in order that the drawings as amended represent the services and conditions As-Constructed. One set of As-Constructed drawings shall be submitted to the Township within one year of final completion and prior to the final reduction or return of securities.

3.21.17 Final Inspection

Upon completion of **all** construction the Developer shall request the Township to carry out a final inspection of the works. **All** deficiencies found during this final inspection shall be immediately corrected by the Developer.

This final inspection shall be carried out for the benefit of the Township and shall in no way relieve the Developer of their obligations under the Ontario Building Code Act, Condominium Act and / or the Site Plan Agreement.

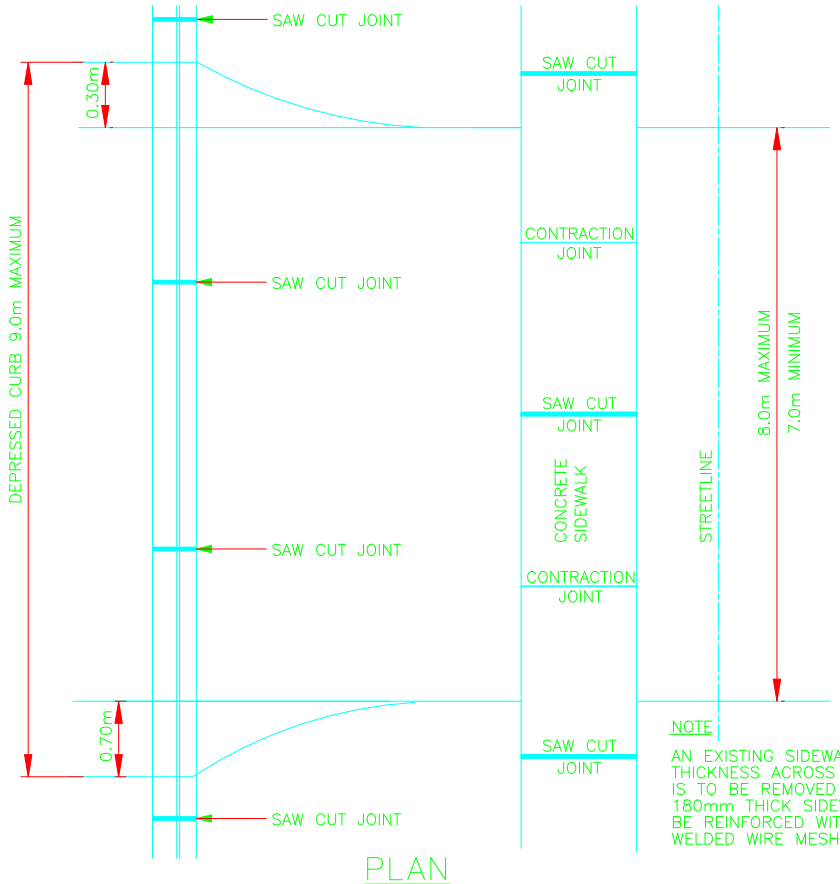
3.21.18 Certification

The Developer's Consulting Engineer shall monitor construction of **all** site grading and servicing works.

All sod, landscaping and asphalt works, and rooftop and flow control devices installed shall be inspected by the Engineer for the certificate to be valid.

The Developer’s Consulting Engineer shall confirm that the stormwater storage volumes and structures are in place and shall function without adverse effect to adjacent structures and lands.

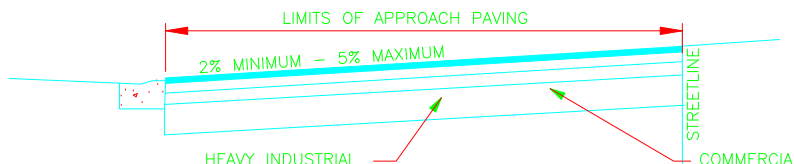
Upon completion of construction and Final Inspection the Developer’s Consulting Engineer shall provide written certification to the Township that **all** works comply with the approved Site Plan, Stormwater Management Report, and the Site Plan Agreement. The wording is to be followed by the Professional Engineers stamp and signature.



NOTE

AN EXISTING SIDEWALK OF LESS THAN 180mm THICKNESS ACROSS THE PROPOSED DRIVEWAY IS TO BE REMOVED AND REPLACED WITH A 180mm THICK SIDEWALK. NEW SIDEWALK TO BE REINFORCED WITH 150mm x 150mm 6/6 WELDED WIRE MESH.

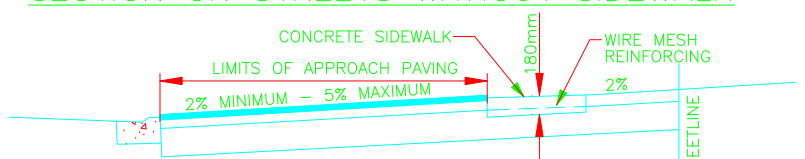
PLAN



HEAVY INDUSTRIAL
40mm HL3 ASPHALT SURFACE COURSE
75mm HL8 ASPHALT BASE COURSE
150mm GRANULAR 'A'
300mm GRANULAR 'B'

COMMERCIAL, LIGHT INDUSTRIAL, APARTMENTS
40mm HL3 ASPHALT SURFACE COURSE
50mm HL8 ASPHALT BASE COURSE
150mm GRANULAR 'A'
300mm GRANULAR 'B'

SECTION ON STREETS WITHOUT SIDEWALK



HEAVY INDUSTRIAL
40mm HL3 ASPHALT SURFACE COURSE
75mm HL8 ASPHALT BASE COURSE
150mm GRANULAR 'A'
300mm GRANULAR 'B'

COMMERCIAL, LIGHT INDUSTRIAL, APARTMENTS
SEE DRIVEWAY DESIGN ABOVE

SECTION ON STREETS WITH SIDEWALK

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS OR METERS UNLESS OTHERWISE SPECIFIED.

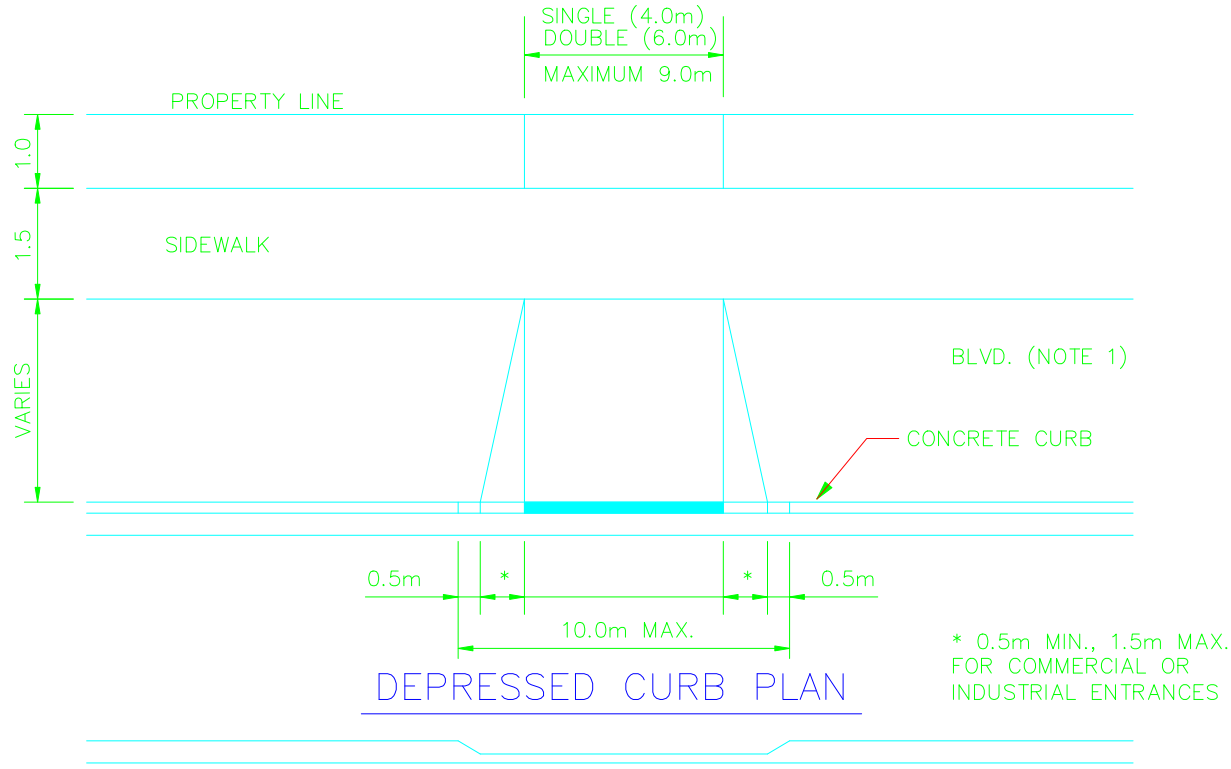
NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO–MEDONTE

APR'D:	DATE: 03 / 2016
DRAWN:	SCALE: NTS

DRIVEWAY APPROACH PAVING – COMMERCIAL, INDUSTRIAL AND APARTMENTS

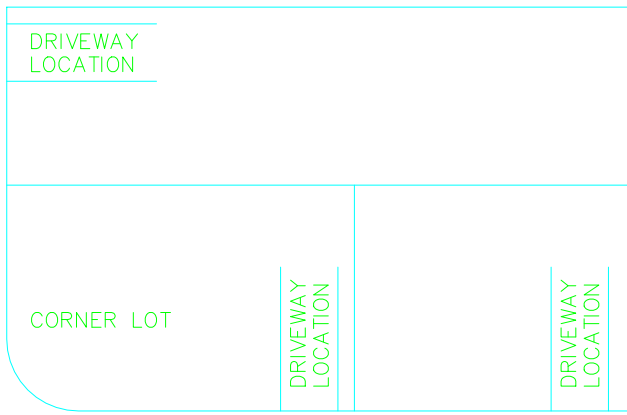
STD. No. 3.21–01



DEPRESSED CURB PLAN

* 0.5m MIN., 1.5m MAX. FOR COMMERCIAL OR INDUSTRIAL ENTRANCES

ELEVATION



CORNER LOT LOCATIONS

NOTES:

1. DRIVEWAY SHALL NOT BE MORE THAN 50% OF LOT FRONTAGE.
2. CROSSFALL OF SIDEWALK 2.0% UNLESS OTHERWISE APPROVED.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NO.	REVISION	APR'D	DATE

TOWNSHIP OF ORO-MEDONTE	APR'D:	DATE: 03 / 2016
	DRAWN:	SCALE: NTS
DRIVEWAY APPROACH PAVING – COMMERCIAL, INDUSTRIAL AND APARTMENTS	STD. No. 3.21-02	

TOWNSHIP OF ORO-MEDONTE

I.C.I. SITE SERVICING, STORMWATER MANAGEMENT, EROSION & SEDIMENT CONTROL and GRADING PLANS CHECKLIST

Project / Developer's Name:_____

Developer's Engineer:_____

Engineer's Contact Info:_____

Project Address:_____

SPA File No:_____ Date:____/_____/_____/

Engineering Contact:_____ Planning Contact:_____

ALL Site Plan Designs Reviewed by the Subdivision Engineer of Record **or**
Assumed I.C.I. Subdivision / Stand Alone Site Plan submitted by a Professional Engineer

SITE SERVICING PLAN(s)

	Description	**Yes**	**No**	**N/A**
	Site Servicing Plan Stamped and Signed by P.Eng			
	Date of Submission / Submission #			
	North Arrow and Key Plan			
	Legend and Metric Scale			
	Geodetic Benchmark Information			
	Site Statistics and Property Dimensioning			
	Municipal / Utilities Easements and Maintenance Access Locations			
	Engineered Fill Location(s) Indicated			
	Road and Road Side Detail – Ditch Lines / Centre Line Grades / Required Widenings			
	Road and Road Allowance Restoration Notes			
	Driveway Culvert Lengths and Diameter / Culvert Inverts and Grades			
	Driveway Curb Cut Length / Driveway Width / Curb Radii / Setback(s) from All Utilities			
	Driveway Locations and Traffic Flow Details Identified			
	Fire Routes / Fire Hydrants / Siamese Connections / Stand Pipes and Storage Tanks Located			
	Site Signage and Light Standards Located			
	Truck and Large Vehicle Delivery Routes, Vehicle Loading, Turning and Parking			
	Personal Vehicle Parking / Accessible Parking Stalls Indicated			
	Water System – Private Well – Location and 15.0m Offset Radius			
	Water Service – Municipal inc.: Pipe size, length, slope, flow direction and material			
	Sanitary System – Private – Septic Tank / Pump Chamber / Tile Bed / Loading Area			
	Sanitary Service – Pipe size, length, slope, flow direction, material and invert elevations			
	Storm Sewers – Pipe size, length, slope, flow direction, material and invert elevations			
	Frost Protection on Shallow Services Required			
	Building(s) Location inc.: Dimensions / Lot Line Setbacks / Grade Elevations / # of Units			
	Storage Areas and Enclosures for Garbage and Waste			
	Sidewalks / Walkways / Ramps / Entrance Locations and Elevations (risers as req'd)			

	STORMWATER MANAGEMENT, EROSION & SEDIMENT CONTROL and GRADING PLAN(s)			
	Description	**Yes**	**No**	**N/A**
	Storm Water Management and Grading Plan - Stamped and Signed by P.Eng			
	Property Dimensioning			
	Existing Property Features - Watercourses / Utility or Municipal Easements			
	Sufficient Elevation and Grading Detail on Adjacent Property (3.0m min.)			
	Match Existing Grades at Property Line			
	Silt and Sediment Control Measures Type i.e. Fence / Entrance Mat / Sediment Basins / etc.			
	Silt and Sediment Control Measures Located			
	Building(s) Location inc.: Lot Line Setback Distances / Building Corner Grade Elevations			
	FFE and TFW elevations (TFW 0.15m above grade) indicated			
	Sidewalks / Walkways / Ramps and Entrance Locations and Elevations (risers as req'd)			
	Location and Elevation of Retaining Walls (Top of Wall and @ Grade)			
	Roof-top Control Data i.e. Flow Rate / Depth / Volume / Drain Location / etc.			
	Typical Swale Cross Section Detail - Depth / Minimum / Maximum Sidewall Slopes			
	Elevations and % Grades - Sheet Flow Areas and Parking Lots			
	Overland Flow Routes and Swale Locations and % Grade Indicated			
	Overland Flow Route Sized Properly			
	Correct Controlled Discharge Rate			
	Internal Stormwater Sewer System Indicated			
	Storm Drainage Self-contained (as req'd)			
	SWM Controls, Ponding Elevations, Volumes, Limits etc. Indicated			
	Level of SWM control (2, 5, 10, year etc.) Indicated			
	Allowance for External (In-flowing) Drainage			
	Reports Submitted with Site Plan Plans of Design (as required)	**Yes**	**No**	**N/A**
	Storm Water Management Report - Stamped and Signed by P.Eng			
	Geotechnical Report - Stamped and Signed by P.Eng			
	Functional Servicing Report - Stamped and Signed by P.Eng			
	Traffic Impact Analysis and Report - Stamped and Signed by P.Eng			
	Engineering Cost Estimate - Stamped and Signed by P.Eng			
	Photometric Design Plan - Stamped and Signed by P.Eng			
	Landscaping Plan			
	Landscaping Cost Estimate			
	Environmental Impact Study			
	Natural Heritage Report			
	Archeological Report			
	Other:			
	Other:			