



MUNICIPAL SERVICING STANDARDS

TOWNSHIP OF SOUTHGATE

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MANUAL OF MUNICIPAL SERVICING STANDARDS
THE CORPORATION OF THE TOWNSHIP OF SOUTHGATE

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MANUAL OF MUNICIPAL SERVICING STANDARDS

THE CORPORATION OF THE TOWNSHIP OF SOUTHGATE

PROCEDURE AND DESIGN CRITERIA

A. GENERAL REQUIREMENTS

The Township of Southgate has adopted the following procedure for development of private lands requiring the design, construction and approval of Municipal Services. This policy applies to developers that require site plan approval from the Township under Section 40 of the Planning Act, or for a subdivision approval under Section 50 of the Planning Act. A subdivision approval can include severance or consent agreement where municipal services are extended to service a lot or lot(s) on an existing road allowance, or a draft plan of subdivision where a subdivision agreement is signed to provide full municipal services on new road allowances created through the draft plan process.

1. Prior to the detailed engineering design of a project being undertaken, the Developer will provide various reports which discuss the requirements for the project. The reports shall include but will not necessarily be limited to the following:

- a) Planning Report

All proposed plans of subdivision applications must be accompanied by a Planning Report. This report will briefly describe, site orientation, site issues and inter-relationship of site issues. The report provides a starting point for analysis of the development proposal. This report is not to replace any detailed or specific reports identified during any submission consultation.

- b) Environmental Impact Study (EIS)

With the growing concern for the preservation of natural heritage features and ecological functions and the protection of groundwater resources, there is a need to assess new development and municipal infrastructure projects for environmental impacts both comprehensively and on a project specific basis.

An Environmental Impact Study, if required, shall be prepared by a qualified professional prior to development in order to investigate potential environmental impacts of the proposed undertaking. An Environmental Impact Study will determine whether development may proceed and, if so, will identify actions which could be taken in order of preference to prevent, minimize, mitigate or compensate the environmental impacts of the development.

Any Environmental Impact Study shall be completed in consultation with the appropriate agencies in accordance with the Township's Official Plan, Grand River Conservation Authority, Ministry of Natural Resources and Forestry policies, and/or Federal Department of Fisheries and Oceans and/or any other applicable government agency policies or legislation.

- c) Source Water Protection/Geotechnical Investigation/Soils Report/Hydrogeological Investigation

All proposed plans of subdivisions must be accompanied by a Geotechnical Investigation, Hydrogeological Investigation and a Source Water Protection Review. These investigations shall be required to be carried out by a competent consulting

engineer in order to assess conditions with respect to the proposed infrastructure, building construction and source water protection for the municipal water supply.

The Source Water Protection review shall conform to the requirements of the Clean Water Act, 2006 (as amended from time to time), the applicable Source Protection Plan (as amended from time to time) and all requirements regarding Source Water Protection included in the Township of Southgate and County of Grey Official Plans (as amended from time to time).

For the construction of new roads or underground utilities, a geotechnical investigation will be required. The purpose of the investigation will be to determine the type of soil, its engineering properties, bearing capacity, soil permeability, location of groundwater, underside of footing elevations for all basements of structures (0.6m of separation is required between the underside of all footings and the seasonally high groundwater elevation), and to verify whether contamination is present. Soil investigation work is to take place after determining the proposed sewer or watermain alignment, so that the required boreholes and test pits follow the same alignment.

Soil test borings will be placed at suitable spacing to provide adequate representation of the soil conditions. Additional boreholes may be required to establish the water table for storm water management ponds and to design the foundations of outfall structures. In fill areas or areas close to water courses, piles may be required to achieve satisfactory bearing strength to support any proposed infrastructure. Bedrock profiles will be required to be submitted where applicable.

Groundwater monitoring may be required if deemed applicable. Predevelopment groundwater monitoring can be carried out by advancing boreholes including monitoring wells on the site. Several seasons of data may be required to finalize recommendations related to groundwater. Upon commencing site development, monitoring wells may have to be relocated to areas such as parks, walkways or street boulevards if longer term monitoring is required. Typically, general information from base mapping etc. will not be sufficient.

The soil report will make recommendations for the design of the road base, pipe bedding, construction methods, and soil percolation rates to determine the feasibility of stormwater management infiltration works.

d) Servicing Design Brief or Functional Servicing Report

The intent of the servicing design brief report is to evaluate the effects of a proposed change in land use or development on the Township's municipal servicing infrastructure and watercourses. The report should also address the adverse impacts, if any, of providing this servicing on any environmentally sensitive features (e.g., Areas of Natural and Scientific Interest, Environmental Sensitive Areas and hydrologically sensitive areas, etc.).

The report shall include a preliminary plan for sanitary sewer servicing, and another separate plan for preliminary storm sewer servicing. Each plan is to include pipe inverts, to illustrate how the system will properly drain and match into existing conditions.

The report shall also outline the design assumptions, overall impact on the trunk and local municipal service capacities, such as: location and capacity of municipal water supply, storm drainage outlet and sanitary sewer outlet, water treatment plants, water distribution systems and pressure zones, pump stations, wastewater treatment plants, trunk sewers and stormwater management facilities, etc. due to the proposed change in land use or development, functionality of proposed and existing services,

calculations, supporting documentation and references to previous studies, for each component of the development.

Note; This report typically will address the requirements of other reports listed in the section. If so, these other reports do not need to be submitted under a separate cover.

e) Preliminary Grading Plan

All proposed plans of subdivisions must be accompanied by a Preliminary Grading Plan. This plan shall include proposed grades and elevations at key locations to show how the proposed subdivision will meet lot grading and roadway grading requirements. Existing condition elevations are to be shown where matching proposed grades. Cross-sections shall show how the site will be graded.

The design and calculation of overland flow routes are to be included to understand impacts on the proposed and surrounding lands.

f) Water Distribution Report

The Water Distribution report(plan) is to be submitted and shall address water distribution systems, pressure zones, water consumption - estimated consumption, current capacities of trunk systems, phasing, net impact due to the proposed change in land use or development, need for expansion and upgrades

g) Stormwater Management (SWM) Report

Refer to Section D Stormwater Management.

h) Transportation Impact Study (TIS)

Consideration should be given to the impact of new traffic from the proposed subdivision on the adjacent road system. The Township, County of Grey or Ministry of Transportation may request that a Transportation Impact Study (TIS) or report be undertaken should it be deemed necessary.

i) Environmental Site Assessment (ESA)

An Environmental Site Assessment (ESA) shall be undertaken when a portion of the site is to be dedicated to the Township free of encumbrances and/or when the Township, Grey County or Ministry of Transportation (MTO) requires land dedication for a road widening. When lands are to be dedicated to the Township, a Phase I/II Environmental Site Assessment must be completed in accordance with either CSA Standard Z768-01 or Schedule D of Ontario Regulation 153/04 (as amended from time to time) under the Environmental Protection Act. Depending on the findings of the Phase I ESA, a Phase II ESA and possible record of site condition (RSC) may be required on the portion of the land that is to be dedicated to the Township, County or MTO in accordance with Ontario Regulation 153/04 (as amended from time to time). The Township Building Department may also require a RSC when a property is changing the land use through a Site Plan application, Building Permit, or completing a zone change. Under Ontario Regulation 153/04 (as amended from time to time), a RSC will be required if the proposed development will change the site to a more sensitive land use.

j) Archaeological Assessment

An Archaeological Assessment of the proposed development may be required from a licensed Archaeologist to conduct an assessment of the site, to ensure preservation

or resource removal and documentation of any significant archaeological resources found on site.

k) Heritage Impact Assessments and Conservation Plan

As part of a complete application for the proposed development, the Subdivider may be required to submit a Heritage Impact Assessment and / or Conservation Plan, in accordance with the requirements of Heritage Planning staff and "*Info Sheet #5 Heritage Impact Assessment and Conservation Plans*" of the Ministry of Culture, Tourism and Sport Heritage Tool Kit, to the satisfaction of the Township and County planning staff.

l) Reference to the Township's Municipal Servicing Standards in affect at the time of the report.

m) Any special requirements with respect to the services to be provided or changes to the Township's normal servicing requirements.

n) Easements which are known to be required by the Township and other such legal and property matters as the Township may be aware of at the time.

2. All developments requiring Municipal Servicing shall be undertaken and/or supervised by a Professional Engineer (Engineer) registered with the Professional Engineers of Ontario, or a Consulting Engineering firm authorized to practice in the Province of Ontario. All final drawings and relevant reports submitted to the Township shall bear the seal of the registered professional Engineer responsible for the design of the project. Drawings are at a scale which is adequate to show sufficient detail of the proposed works.

The Engineer shall submit, in triplicate, copies of plans, specifications and pertinent design calculations for the proposed Municipal Services and development details in accordance with the requirements of the Township.

Where appropriate, the plans to be submitted shall include the following:

- a) A copy of the plan for registration in the case of a subdivision or such other legal survey plan(s) as may be available; (only one copy of the legal plan is required).
- b) General plan(s) of the project showing all municipal services;
- c) Area grading plan showing all proposed road and lot drainage;
- d) A storm sewer drainage and storm water management plan including the entire area to be drained;
- e) A sanitary sewer drainage plan including the entire area to be serviced;
- f) Plan and profile of all proposed streets and services;
- g) Plans showing miscellaneous details, if required;
- h) Landscape plan;
- i) Sediment and erosion control plan;
- j) Utility servicing plan/Composite utility plan;
- k) Such other plans as may be required for Site Plan/Subdivision Agreements.

3. The design calculations shall include:
 - a) Storm sewer design sheet.
 - b) Stormwater Management Report
 - c) Sanitary sewer design sheet.
 - d) Design notes on pipe strengths and bedding requirements.
 - e) Geotechnical report including road base and asphalt design details, groundwater levels and subdrain requirements.
 - f) Detailed cost breakdown of all Municipal Services to be provided.
4. The plans, specifications and other documentation submitted will be reviewed by the Township. Written comments, along with markups as required, information submitted will be returned to the Consulting Engineer noting any required revisions. All design and drawings are to be in metric units.
5. When the plans, specifications and other design calculations are considered satisfactory the Township will sign, as the municipality and/or applicant, all applications for submission to the appropriate regulatory agencies.
6. No construction work shall begin on any project until the Township is satisfied that approvals have been received from the regulatory agencies, the Subdivision Agreement has been executed and/or the pre-construction requirements of the subdivision/development agreement have been compiled with.
7. Construction of services and the acceptance thereof, whether preliminary or final, shall be completed on the basis of four distinct stages of construction and where the subdivision or development is phased, within the whole of each phase as approved by the Township. The stages are as follows:
 - a) Stage I services for purposes of this Agreement consist of all underground works including
 - i) all storm and sanitary sewers and foundation drain collection system;
 - ii) watermain;
 - iii) conduits or pipes for the electrical distribution system, communications and street lighting under roads;
 - iv) all other servicing including all water, storm and sanitary sewer service connections to the limit of the street allowance for each proposed building lot or block; and
 - v) storm water management facilities
 - vi) sewage pumping stations
 - b) Stage II services include all works up to and including
 - i) curbs;
 - ii) gutters;

- iii) base asphalt;
 - iv) placement of all required street signs and traffic control signs;
 - v) erection of a sign at least twelve (12) feet by eight (8) feet to be approved by the Township Engineer at each entrance to the subdivision from a public road, which shall depict the plan of subdivision and shall indicate the locations of all sidewalks, restricted parking zones, mailboxes, and fencing including the type of fencing;
 - vi) erection of a sign at least three (3) feet by three (3) feet to be approved by the Township Engineer at each point of entry to the subdivision stating that the services including the streets have not been assumed by the Township, and that anyone using the services or streets does so at their own risk; and
 - vii) completion of parkland with grading, topsoil, approved vegetation including sod or seed.
- c) Stage III services involve the completion of:
- i) the electrical distribution system, communications, street lighting and gas which shall be completed prior to occupancy of any residence; and,
 - ii) all required fencing.
- d) Stage IV services include:
- i) final course of asphalt (to be placed a minimum of one year following placement of base asphalt);
 - ii) sidewalks;
 - iii) street trees; and
 - iv) all other services required by the design.
8. The Engineer or Consulting Engineering Firm responsible for the works shall be required to provide full-time resident inspection during construction. The Engineer shall also be responsible for the submission of AutoCAD and Adobe Acrobat PDF file drawings to make a complete set of "As Recorded" drawings, following the completion of the works. Drawings are to be A1 size.
- If items described in the tender drawings were constructed in variance to the designs illustrated in the approved proposed construction drawings, then the "As Recorded" submissions should be revised and/or edited to accurately reflect how the work in question was actually built. "As Recorded" drawings should also include: locations and inverts of sanitary and storm services; locations and elevations of water services.
9. The Engineer or Consulting Engineering firm responsible for the project will assist the Township in carrying out any appropriate inspections for Preliminary or Final Acceptances.
10. No operation of, or connection to, existing municipal services is permitted without prior approval from the Township Works Department.
11. For items not specifically covered by the Municipal Standards, the minimum criteria to be used will be referenced in the Ontario Provincial Standard Drawings (O.P.S.D.), Ontario Provincial Standard Specifications (O.P.S.S.), Ministry of the Environment, Conservation and Parks (MECP), Ministry of Transportation (M.T.O.), or other recognized authority, and when conflicts arise, the Township's decision will be binding.

B. PLAN AND DRAWING SPECIFICATIONS

The plans and drawings shall be prepared as follows:

B.1. GENERAL PLAN

- a) Minimum scale of 1:1000.
- b) Indicate a north arrow and construction north arrow.
- c) Show a title block.
- d) All datum should be referred to a metric geodetic municipal benchmark.
- e) Show all the existing and proposed lots, blocks, easements, road allowances and street names.
- f) Show all existing and proposed curbs and sidewalks.
- g) Show the direction of flow for all existing and proposed sewers and ditches.
- h) Show all existing and proposed sewer sizes, maintenance holes, catch basins, and stormwater detention areas.
- i) Show all existing and proposed watermain sizes including valves and hydrants.
- j) Show all existing and proposed services and utilities.
- k) Show all existing structures, vegetation, natural features on, or adjacent to the subject property.
- l) Show proposed phasing.
- m) Show all abutting properties and land usage.
- n) Show a table for a list of revisions.

B.2. PLAN AND PROFILE DRAWINGS

The plan and profile drawings shall be prepared in accordance with the Standard Drawings, to the satisfaction of the Municipality, and as follows:

- a) All plans and profiles must be drawn at a minimum scale of 1:500 horizontally and a 1:50 vertically.
- b) Indicate a north arrow.
- c) Show a title block and key plan.
- d) All elevations should be referred to a metric geodetic municipal benchmark.
- e) Show all the existing and proposed lots, blocks, easements, road allowances and street names.
- f) Show all existing and proposed curbs and sidewalks.
- g) All existing basement elevations must be shown on the profile (where applicable).
- h) Show all existing and proposed sewer and watermain lengths, types and class of pipe, type of pipe bedding, grades and direction of flow, roadways, and include all services on both plan and profile drawings.
- i) Show all existing structures, vegetation, natural features on, or adjacent to the subject property.

- j) Show dimensions and curb radii.
- k) Where the plans are amended or revised after they have been approved by the Township Engineer, the date of amendment or revision shall be noted in the table for the list of revisions on the plan, and resubmitted to the Township Engineer.

B.3. LOT GRADING PLANS

See Section H.

C. SANITARY

C.1. SANITARY SEWERS

Sanitary sewers with service connections to each lot or block shall be provided in accordance with the Ministry of the Environment and Climate Change Design Guidelines for Sewage Works (2008), as amended from time to time, and the following Township of Southgate design criteria.

All sanitary sewers shall be designed so that the hydraulic gradeline under peak flow condition is equal to or below the obvert of the pipe. Velocities shall be sufficient for self-cleansing of the mains.

Capacity:	Manning's Formula (full flow)
Population:	Based on Official Plan and Zoning By-Law maximum densities. Residential - Maximum Densities from Official Plan or Zoning By-Law or other criteria as determined from capacities of existing trunk services and facilities.
Domestic (Residential) Flows:	350 L/cap/d. (litres per capita per day)
Non-Residential Flows:	To be determined by the applicant.
Extraneous Flows:	0.15 L/ha.s. (litres per hectare per second)
Peaking Factor:	a) Commercial peaking factor of 1.0 b) Residential (Harmon Formula) $M = 1 + \frac{14}{4 + \text{Pop.}^{0.5}} \quad \begin{matrix} \text{(Maximum = 4.0)} \\ \text{(Pop = Population/1,000)} \end{matrix}$ c) Industrial: As per Ministry of Environment Design Guidelines for Sewage Works, 2008
Minimum Velocity:	0.6 m/s based on actual flow
Maximum Velocity:	3 m/s
Pipe Roughness:	Manning's "n" value 0.013 for concrete and PVC pipes.
Minimum Size:	200 mm (trunk or collector) 100 mm or match existing (residential services) 150 mm (industrial, commercial or multiple residential services) Decreases in pipe size from upstream to downstream will not be permitted.
Pipe Bedding:	As indicated in Table 1.
Pipe Materials:	Refer to Table 2.
Minimum Depth of Cover:	2.4 m to obvert.
Maintenance Hole Spacing:	100 m for pipes up to 1200 mm diameter

Maintenance Hole Diameter:	<p>Minimum of 1200 mm diameter or as per manufacturer's specifications/recommendations. Pre-benched structures to be used where possible.</p>									
Maintenance Hole Pipe Connections:	<p>Approved "Kor-N-Seal" pipe adaptors shall be used for the connection of all pipes at maintenance holes.</p>									
Maintenance Hole Drop Structure:	<p>Required where the inlet and outlet inverts differ by more than 0.6 m.</p>									
Invert Drops Across Maintenance Holes:	<p>Determined by hydraulic calculations for all junction and transition maintenance holes.</p> <p style="margin-left: 40px;">For all others:</p> <table border="0" style="margin-left: 80px;"> <tr> <td>0° Turn</td> <td>20 mm</td> </tr> <tr> <td>10° - 45° Turn</td> <td>50 mm</td> </tr> <tr> <td>46° - 90° Turn</td> <td>80 mm</td> </tr> </table>	0° Turn	20 mm	10° - 45° Turn	50 mm	46° - 90° Turn	80 mm			
0° Turn	20 mm									
10° - 45° Turn	50 mm									
46° - 90° Turn	80 mm									
Maintenance Hole Adjustment:	<p>Precast concrete adjustment units to be used.</p> <p>Minimum 150 mm adjustment allowance. Maximum 300 mm adjustment allowance.</p> <p>No brick, block or steel lift rings permitted.</p>									
Maintenance Hole Water Tight Frames and Covers:	<p>Where there is a possibility for flooding, water tight lids and maintenance hole inserts (as manufactured by MANPAN®) shall be installed.</p>									
Maintenance Hole Safety Grates:	<p>For maintenance hole depths between 5.0 and 10.0m, a safety grate must be installed at the mid-point. For maintenance hole depths between 10.0 and 15.0 m, a safety grate must be installed at the third points. Refer to OPSD 404.020 (latest revision).</p>									
Maintenance Hole Waterproofing/Sealing:	<p>All maintenance hole joints, adjustment ring assemblies shall be sealed water tight with the Riser-Wrap® water infiltration system as manufactured by Pipeline Seal and Insulator Inc. or Mel-Rol waterproofing membrane installed with all necessary accessory products all in accordance with the manufacturer's recommendations.</p>									
Service Connections:	<table border="0" style="margin-left: 20px;"> <tr> <td>Minimum Diameter</td> <td>-</td> <td>100 mm for residential services and 150mm for commercial and industrial or match existing</td> </tr> <tr> <td>Minimum Grade</td> <td>-</td> <td>2%</td> </tr> <tr> <td>Maximum Grade</td> <td>-</td> <td>8%</td> </tr> </table> <p>All connections to be made with a factory-made tee or wye or approved equivalent unless connecting to an existing main, where a stainless-steel strap and saddle may be permitted.</p> <p>One service/residential unit for singles, semis, row or block townhouses. Services are not to be placed in the driveway where possible. See Standard DrawingS1 for service layout.</p>	Minimum Diameter	-	100 mm for residential services and 150mm for commercial and industrial or match existing	Minimum Grade	-	2%	Maximum Grade	-	8%
Minimum Diameter	-	100 mm for residential services and 150mm for commercial and industrial or match existing								
Minimum Grade	-	2%								
Maximum Grade	-	8%								

For industrial services a maintenance hole shall be installed adjacent to limit of the road right-of-way (ROW) but entirely within the ROW.

Typically, service connections are NOT to have clean-outs. However, in certain circumstances (i.e., long services, constrained) services may need to be outfitted with clean-outs at property line, this will be at the discretion of the Township.

Closed Circuit T.V. (CCTV) Inspections:

Closed circuit T.V. (CCTV) inspections of the main sewers and services connections up to the property line will be required at the following three (3) milestones:

- Prior to Preliminary Acceptance (after base asphalt and curb is placed)
- Prior to surface asphalt.
- Prior to Final Acceptance of development

Additional closed circuit T.V. (CCTV) inspections of services maybe required prior to occupancy of buildings.

Testing:

Maintenance Holes shall be tested in accordance with O.P.S.S. 407 (latest revision)

Field testing of sanitary sewers shall be tested in accordance with O.P.S.S. 410 (latest revision)

C.2. SANITARY SEWAGE PUMPING STATIONS

Sanitary sewage pumping stations shall be designed in accordance with the latest edition of the Ministry of Environment and Climate Change design guidelines for sewage works. The design shall be completed by a Professional Engineer licensed in the Province of Ontario.

Station Design: (based on Peak Flow)	100 L/s (or Less)	-	Two pumps (wet well) (Duty and Standby)
	Greater than 100 L/s	-	Three pumps (dry well) (Jockey, Duty and Standby)

Pumps:

Submersible, premium efficiency, rated manufactured by Flygt/Xylem complete with seal monitoring systems for the model of pump selected.

All pump installation accessories (anchor bolts, guiderail holders, chain hooks, lifting chain, etc.) shall be 316 stainless steel.

Removal guiderails shall be galvanized steel (as per pump supplier's recommendations). Pump removal equipment (davits lifting arms etc.) shall be supplied by the pump supplier.

Discharge/suction elbow supplied by the manufacturer for wet well and dry well installations respectively.

Dry wells shall be equipped with sewage sump pumps with a minimum discharge diameter of 75 mm.

Piping:

For conveying sewage, sump pump discharge and potable water shall be flanged Schedule 40S, 316L stainless steel, originating from a Canadian or an American mill. Mill reports shall be provided.

100 mm in diameter and larger shall be flanged. Flange backing rings shall be hot dipped galvanized steel.

Flanged connections shall be assembled with 316 stainless steel bolts, nuts, washers, etc. and all threads treated with copper based anti-seize compound.

Pump discharge (riser pipes) shall enter the discharge header via a 45-degree wye connection through the side.

Discharge header shall include:

- A valve near the wall of the chamber where the header exits the station
- 75 mm diameter drain complete with valve
- 150 mm diameter station by-pass/forcemain flushing connection complete with valve.

Flow Metering:

Magnetic flow meter shall be located in either the dry well or in a separate chamber outside the wet well or dry well.

Piping and valves for a meter bypass shall be provided.

Sufficient number (minimum of 4) of bidirectional knife gate valves shall be installed to isolate the flow meter and the meter bypass.

Meter shall be rated as explosion proof (Class 1, Division 1, Group D) and for continuous/prolonged submersion (NEMA 6P) in water/sewage.

Valves:

Check valves shall be Valmatic Surge Buster check valves with fusion bonded epoxy coating inside and out, 316 stainless steel cover bolts, disc accelerator, backflow actuator and EPDM reinforced disc.

Isolation valves for pump discharges and flow meters shall be stainless steel bi-directional knife gate valves and manufactured by Dezurik KCB or Stafsjo.

Valves shall be wafer style/semi-lug design, ANSI class 150, full port, two-piece stainless-steel body with a stainless-steel super structure and standard gland packing. The 316 stainless steel, fully machined blade will have rounded edges and be fully guided to prevent blade movement causing stuffing box seal failure.

The gland box shall be fully machined with radiused ends to match the round edges on blade.

There will be a fully encapsulated seat of EPDM material which is field replaceable.

The valve will be non-rising stem with a double lead acme screw thread which together with needle axial bearings assures ease of operation.

All valves shall be operational from outside the wet well for wet well only configurations.

Provide suitable operators for all isolation valves in wet wells and dry wells.

Dual check valves and a plug valve shall be installed on the sump pump discharge piping.

Controls:

All stations shall include the installation of variable frequency drives manufactured by ABB Inc.

Motor control centre (MCC) is to be manufactured by Eaton or Allan-Bradley.

All system programmable logic control (PLC) panels shall be manufactured by Allan-Bradley and shall be SCADA programmed using language that is the same as that used in other Township sewage facilities at the time of installation.

The human machine interface shall have a colour touch screen that is 375 mm (15") wide.

Program source code shall be provided to the Township.

Ladders and Platforms:

Wet Wells shall be equipped with aluminium platforms inside the wet well for servicing equipment.

Platforms shall be equipped with safety anodized aluminium guardrail with 150 mm high kick plates. Safety chains for the guardrail shall be stainless steel.

Dry Wells shall be equipped with aluminium or fiberglass stairs complete with anodized aluminium or fiberglass handrail to allow easy access to the wet well for operating staff.

All ladders shall be 316L stainless steel with a minimum 20 mm diameter anti-slip rungs with 50 mm wide by 10 mm thick (minimum) side rails.

All anchoring systems for platforms and ladders (drop-ins, bolts, nuts, washers, etc.) shall be 316 stainless steel with minimum bolt diameter of 13 mm.

Hatches:

Shall be supplied with manufacturer structural calculations stamped by a registered Professional Engineer in the Province of Ontario.

All wet wells and flow metering chambers shall be equipped with aluminium access hatches rated for "H20" Loading.

All hatches shall be

- 750 mm x 900mm for personnel access
- Pump access hatches shall be sized based on pump dimensions

Channel frames shall be a minimum ¼" aluminium with full anchor flange around the perimeter and have a minimum cross-sectional area of 7.5 square inches for proper water drainage

Covers shall be equipped with Type 316 stainless steel hinges having a minimum 3/8" diameter stainless steel pins that pivot so the cover does not protrude into the channel frame.

Compression springs shall be fully enclosed in telescopic tubes with the outer tube being the upper to prevent accumulation of moisture, grit and debris inside the tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed ¼" gusset support plate.

The required number and size of compression spring operators to provide smooth, easy, controlled operation through the entire arc of opening and to act as a check in retarding downward motion when being closed shall be provided. The operation shall not be affected by temperature.

Covers shall also be complete with:

- Type 316 stainless steel hardware for installation in a highly corrosive environment.
- a stainless-steel hold-open arm which automatically locks the cover in the open position and a conveniently located handle to release the covers for closing.
- A recessed padlock hasp covered by a hinged lid that is flush with the surface.
- A lift handle that is designed to be flush with the walking surface when not in use. Complete with 40 mm (1½") drain coupling located in the right front corner of the channel frame.
- all hardware for installation in a highly corrosive environment, Type 316 stainless steel.

Hinges shall be specifically designed for horizontal installation and shall be through bolted to the cover with tamperproof stainless steel lock bolts and shall be through bolted to the frame with stainless steel bolts and lock nuts, flush with the covers' surface.

All hatches shall be provided with hinged safety access grates, equipped with retractable lifting handle, rated for and reinforced for a live load of 14.4 kN/m², equipped with lock mechanism which holds the grate at 90 degrees vertical.

Aluminium safety grating shall be powder coated safety orange applied by electrostatic spray process. Coating shall be a thermosetting epoxy powder coat finish minimum 2 mm thick and baked at 180 degrees C until cured.

Venting:	<p>Wet well vents shall be 11 gauge, 304L stainless steel complete with stainless steel 24 mesh screen.</p> <p>Vent screens shall be removable with stainless steel fasteners.</p>
Control Building:	<p>Offset from the wet well location or Above the dry well.</p> <p>Shall be constructed of concrete masonry block with either brick or face block as the architectural finish of the exterior of the facility, approved by the municipality.</p> <p>If designed with a pitched roof, the roofing material shall be pre-painted galvanized steel as manufactured by Indal Metals, Vic West Steel or Agway Metals Inc. with panel core thickness minimum of 26 gauge. Panels shall be long enough so that horizontal splices are not required. The nominal width of the panels shall be a minimum of 600 mm.</p>
Louvers:	<p>Architectural louvers for the building shall be pre-painted aluminium and be designed to attenuate noise to 70 dB at 7.0 m.</p> <p>Motorized dampers for the louvers shall be aluminium.</p>
Standby Power:	<p>Stations shall include the supply and installation of standby power diesel or natural gas generators sized to operate the entire electrical system of the station continuously plus 25% spare capacity for future loads.</p> <p>Fuel tank (as applicable) shall be double walled, integral with the generator complete with tank with a capacity to operate the generator under full load for 72 hours.</p> <p>Silencer shall be hospital grade with an acoustical design of the generator enclosure/building minimum of 70 dB at 7.0 m. Acoustic evaluation and design shall be completed by a Professional Engineer licensed in Ontario. The generator may be housed in the station control building or in an acoustically designed walk-in enclosure supplied by the generator manufacturer.</p> <p>Acceptable generator suppliers include:</p> <ul style="list-style-type: none"> - Toromont/Caterpillar - Cummins Eastern Canada, Kohler (Paramount Power Systems) - T&T Power - Wajax Power Systems - GAL Power. <p>Installation shall comply with all applicable regulations including but not limited to all requirements of the Technical Standards and Safety Authority (TSSA).</p>

Fencing: Black vinyl covered galvanized wire (50 mm mesh No. 6 gauge) with 1.2 oz/ft² (366 g/m²) of galvanizing on wire and barbed wire overhang pointing outward.

Overall height shall be 2400 mm including the barbed wire projection

Access Road: Paved and suitable for expected truck/maintenance vehicle access, complete with necessary snow storage.

Commissioning: Township staff shall be trained on all equipment at the station and shall be provided with an overall functional operating and maintenance manual along with manufacturer's operating and manuals for all equipment installed at the station

C.3. SANITARY FORCEMAINS

Capacity: Hazen-Williams Formula (full flow)

Pipe Roughness: Hazen-Williams "C" value 120

Colour/Material: White or Purple PVC SDR 26 (minimum pressure rating of 160 PSI

Pipe strength, pressure rating and dimension ratio shall be determined through the completion of a transient analysis.

Minimum Velocity: 0.6 m/s

Maximum Velocity: 3.0 m/s

Vacuum Relief Valves: Every 500 m of forcemain length and as recommended by transient analysis, within precast concrete chambers complete with one forcemain flushing connection

Piping inside flushing and relief valve chambers shall be Schedule 40S stainless steel complete with isolation valves.

Manufactured by ARI Valves, suitable for use with wastewater

Depth of Cover: 2.0 m with tracer wire as specified for watermain

D. STORM DRAINAGE

D.1. STORM SEWERS

Storm drainage systems including lot grading, catchbasins and piped outlets shall be designed with consideration being given to Major and Minor systems. Minor systems are to be conveyed to the receiver (stormwater management facility or watercourse) via sewers. Major flows are to be conveyed via overland routes.

The storm drainage system shall adhere to the Ministry of the Environment Guidelines and following the Township of Southgate design criteria:

Rainfall Intensity:	MTO Dundalk Specific IDF, current data.
Design Storm:	Minor System: 1/5 Year storm local sewers 1/10 high value commercial development downtown business and trunk collectors. Major System: Regional Storm expressed as "Hurricane Hazel" or 1/100 year (whichever generates greater runoff values). Rural System: 1/25 Year storm for road culverts. 1/10 Year storm for driveway culverts.
Rainfall Distribution:	3-hour Chicago.
Runoff Coefficients:	The drainage area shall include all lands which will outlet through one common system. The design shall take into consideration the eventual use of all the lands within the drainage area and assign the appropriate coefficient to the lands based on the designation in the Official Plan.
Inlet Time:	Major System: Bransby Williams 10 minute minimum Minor System: Bransby Williams 10 minute minimum
Pipe Roughness:	Manning's "n" value, 0.013 for concrete, PVC and smooth wall high density polyethylene pipes. Manning's "n" value, 0.024 for corrugated steel pipes.
Pipe Capacity:	Sewers - Manning's Formula (full flow) Culverts - MTO Drainage Manual, Section 'D'
Pipe Materials:	See Table 2.
Pipe Bedding:	See Table 1.
Minimum Velocity:	0.75 m/s
Maximum Velocity:	4.5 m/s
Maintenance Hole Spacing:	100 m for pipes up to 1200 mm dia. 150 m for pipes greater than 1200 mm dia.

Maintenance Hole Diameter:	Minimum of 1200 mm dia. or as per manufacturer's specifications/ recommendations.
Structure Pipe Connections:	Brick, block and non-shrink grout shall be used for the connection of concrete at structures. Approved "Kor-N-Seal" pipe adaptors shall be used for the connection of PVC pipes at structures.
Structure Adjustment:	Precast concrete adjustment units shall be used. Minimum 150 mm adjustment allowance. Maximum 300 mm adjustment allowance. No brick, block or steel lift rings permitted.
Catchbasin Spacing:	75 m maximum.
Catchbasin Leads:	1.0% Minimum Slope
Rear Yard Drainage:	Surface inlets (catchbasin or inlet basin) are required every 2 units (townhouse or singles) along rear lot line swales. Singles will require full catchbasins for all structures. Townhouses require a catchbasin at the lead from the road but inlet basins can be used thereafter. Sewer from the road the rear yard (i.e. on sideyard) is to be a minimum of 300 mm diameter concrete pipe offset 0.5 m from the lot line situated on a 3 m easement divided equally on the side lot line. Sewers across the rear lot line to be offset 1 m from the lot line on a 3 m easement entirely on one lot. Sewers along the rear lot lines of townhouses are to be a minimum of 200 mm in diameter. Where the number of upstream inlets basins exceeds 2, the pipe size is to be increased to a minimum of 250 mm in diameter. These sewers along the rear can be PVC or HDPE. Sewers along the rear lot lines of singles are to be a minimum of 250 mm in diameter. Where the number of upstream catchbasins exceeds 1, the pipe size is to be increased to a minimum of 300 mm in diameter. These sewers along the rear can be PVC or HDPE.
In-Line Drains:	Where storm sewers are extended along rear yard swales behind multiple unit blocks, in-line drains are to be installed for every two units.
Twin Inlet Catchbasins:	Required at all sag points.
Blind Connections:	Not permitted to storm sewers under 900 mm diameter.
Sumps:	450 mm diameter pipes and under require 600 mm sump in catchbasins and maintenance holes.
Benching:	Required for pipes over 450 mm diameter.

Minimum Cover:	1.2 metres
Minimum Size:	200 mm where only services are connected 300 mm (trunk) Single CB leads 250 mm Twin Inlet CB leads 300 mm 375 mm culvert

All lots to have service connection for foundation drain sump pump discharge. Gravity connections at building not permitted. See Standard Drawing S2.

Service Connections:	Minimum size	- 100 mm
		- 150 mm
		(2 shared townhouse units)
	Minimum Grade	- 1%
	Minimum depth @ Property Line	- 1.2 metres

Services to be located 1.5 m minimum from side lot line, for singles locate on low side of lot. One service/residential unit for singles, and two units per shared service on semis, row or block townhouses. See Standard Drawing S1 for service layout.

All connections to be made with an approved prefabricated tee or "Kor-N-Tee".

Roof Drains: All roof drains shall discharge to surface.

Storm Sewer Outlets: Suitable bank and stream bottom erosion protection must be provided i.e., headwalls, rip rap, CSP end section, etc.

Subdrain: A minimum of 6 m of 100 mm diameter geotextile wrapped subdrain is required upstream of all storm structures and in both directions at sags in the road profile. Additional subdrain as recommended by geotechnical consultant.

Testing: Maintenance Holes shall be tested in accordance with O.P.S.S. 407 (latest revision)

Field testing of storm sewers shall be tested in accordance with O.P.S.S.410 (latest revision)

D.2. STORM WATER MANAGEMENT

Quality Control: In accordance with *"Stormwater Management Planning and Design Manual"*, March 2003 by the Ministry of Environment and Climate Change.

Quantity Control: Control of post-development runoff flows to pre-development levels for rainfall events with return periods between 5 and 100 years. Over-control may be required to satisfy downstream constraints.

All hazard lands, wetlands, Environmentally Sensitive Areas (ESAs), Areas of Natural or Scientific Interests (ANSIs) and floodlines are to be identified on drawings.

Facility configuration and landscaping to incorporate design recommendations outlined in the document entitled *"Design Principles of Stormwater Management Facilities"*, August 1996. A copy of the document is available upon request.

Sediment/Erosion Control: Detailed plan to be submitted for approval.

All Stormwater Management Facilities shall be subject to Class Environmental Assessment requirements and/or requirements for same under the Planning Act.

Note: Other approving agencies may have additional requirements.

E. WATER

E.1. WATER SUPPLY SYSTEM

Central water supply systems shall be designed in accordance with current Ministry of the Environment and Climate Change Design Guidelines for Drinking Water Systems (2008), as amended from time to time, and all applicable Regulations. All materials used for the municipal drinking water system shall meet all applicable American Water Works Association (AWWA) and National Sanitation Foundation (NSF) standards. All fittings associated with the water supply system shall meet NSF 372 requirements for lead content.

The Functional Servicing report shall address the requirements for water supply to service the Development. Should the existing supply system not have sufficient capacity to provide for new development, the development will be delayed until additional water supply is secured.

Fire flow protection and storage provisions shall be reviewed with the Township of Southgate for each development during the initial stages of Draft Plan Approval as part of the Functional Servicing Report. Any expansions/upgrades to the existing water system required to support the development, including additional supply, storage facilities and/or trunk mains will be considered at that time.

Note: Developments outside the areas designated by Council as requiring municipal water supply systems may be approved on the basis of individual wells and sewage disposal systems. The specific requirements for central water systems in rural areas shall be reviewed with Council on submission of the Preliminary Draft Plan.

E.2. WATERMAINS

Watermains with services to each lot or block shall be provided in accordance with the Ministry of the Environment and Climate Change Design Guidelines for Drinking Water Systems and the following Township of Southgate Works Department design criteria based on ductile iron ANSI A21.51 AWWA C151 or PVC C900 Class 235 (DR18) CSA B137.3 pipe.

Capacity:	Hazen-Williams formula in accordance with current Ministry of the Environment and Climate Change design criteria.
Population:	See Section "C" - Sanitary Sewers.
Design Flow:	Greater of Maximum Daily Demand plus Fire Flow or peak demand flow.
Average Day:	450 L/cap.d. (litres per capita per day)
Peaking Factor:	In accordance with current Ministry of the Environment and Climate Change design criteria.
Minimum Size:	150 mm diameter mains
Minimum Depth of Cover:	2.0 metres for mains and services.
Location:	In accordance with the Township of Southgate typical road cross-sections. (See Standard Drawing R1 and R2.)
Material:	See Table 2.
Pipe Bedding:	As indicated in Table 1.

Tracer Wire:	<p>All watermain and services shall be installed with tracer wire.</p> <p>#12 AWG Copper Clad Steel. High Strength with minimum 450 lb. break load and minimum 30 mil HDPE insulation thickness suitable for direct burial and colour coded blue.</p> <p>Direct bury wire connectors shall include 3-way lockable connectors and mainline to lateral lug connectors specifically manufactured for use in underground trace wire installations. Connectors shall be dielectric silicon filled to seal out moisture and corrosion. Non-locking friction fit, twist or taped connectors are prohibited.</p> <p>Above ground tracer wire access boxes shall be attached to underside of bottom flange of fire hydrants. (Std. Dwg. No. W3)</p>
Fittings:	<p>Ductile Iron, mechanical joint, AWWA C110 approved, pressure rating 1035 kPa.</p> <p>PVC bends and tees, to be used with mechanical joint restraints.</p>
Valves:	<p>One less valve than number of streets at an intersection with valve located at extension of the property line of the intersecting street.</p> <p>Maximum 200 m spacing on straight runs.</p> <p>Maximum 250 m spacing on trunk lines.</p> <p>Chambers will be required for all valves over 300 mm dia. (OPSD 1101.01)</p>
Valve Type:	See Table 2.
Valve Boxes:	See Table 2.
Hydrants:	<p>See Table 2.</p> <p>All hydrants to be painted <u>RED</u> with red Storz cap.</p> <p>Anchor tees to be used with hydrant installation.</p>
Hydrant Spacing:	150 m maximum.
Services:	<p>25 mm diameter services</p> <p>All services to be Type "K" copper pipe unless otherwise approved by the Township of Southgate Public Works Department. Cross-Linked Polyethylene ("Municipex" by Rehau and "Blue904" by IPEX) may be considered for services over 20 m in length.</p> <p>75 mm PVC sleeves are required where curb stops are located in driveways. Note: curb stops are not to be placed in driveways where possible.</p> <p>Temporary plastic blow-off pipes are required for all unconnected services. See Table 2.</p>

Anodes: DZP-24, 10.9 kg shall be installed on all connections to existing iron watermain.
DZP-12, 5.4 kg shall be installed on all iron fittings, valves etc.

Mechanical Joint Restraints:

- Uni-Flange Series 1300 manufactured by Ford Meter Box Company, Inc.
- Megalug Series 1100 for ductile iron pipe
- Megalug Series 2000 PV for PVC C900 pipe
- Stargrip Series 3000 for ductile iron pipe
- PVC Stargrip Series 4000 for PVC C900 pipe

Water Sampling Stations: Sampling stations shall be Eclipse #88 on a pedestal as manufactured by the Kupferle Foundry Company on the same side of the ROW as the Watermain. The number and location of water sampling locations shall be reviewed and approved by the Township.

Additional details are shown on the Township of Southgate Standard Drawings.

The Developer's contractor shall not operate any valve or hydrant of the existing water distribution system. Operation of valves and hydrants on the municipal system shall only be undertaken by certified municipal staff.

Grounding of hydro services to the municipal water system is prohibited.

E.3. WATERMAIN TESTING PROCEDURES:

E.3.0 Temporary watermain connection shall be as follows:

- 3.0.1 No new watermain shall be connected to an existing watermain until all testing procedures have been completed and approved by the Township of Southgate Public Works Department.
- 3.0.2 The new watermain shall be kept isolated from the existing waterworks system using a physical separation until satisfactory bacteriological testing has been completed and accepted by the municipality. Water required to fill the new main for hydrostatic pressure testing, disinfection, and flushing shall be supplied through a temporary connection between the existing water system and the new main (refer to Std. Dwg. W4 and W5). The temporary connection shall include an appropriate and approved cross-connection control device (reduced pressure zone backflow preventor or a double check valve assembly). Public Works Department may require written certification of the backflow preventer operation in accordance with CAN/Canadian Standards Association-B64 Series Manual.
- 3.0.3 At the beginning of each new watermain installation, a minimum of one (1) swab shall be installed. Swabbing of the new watermain shall be completed prior to hydrostatic testing.

E.3.1 Hydrostatic Testing

(Reference OPSS 441 and AWWA Standards appropriate for pipe materials):

- 3.1.1 Hydrostatic testing shall be conducted under the supervision of the Township of Southgate Public Works Department upon completion of the watermain including services and backfilling.
- 3.1.2 A test section shall be either a section between valves or the completed watermain.
- 3.1.3 Test pressure shall be 1035 kPa.
- 3.1.4 The test section shall be filled slowly with water and all air shall be removed from the pipeline. A twenty-four (24) hour absorption period may be allowed before starting the test. The test section shall be subjected to the specified continuous test pressure for two (2) hours.
- 3.1.5 The leakage is the amount of water added to the test section to maintain the specified test pressure for the test duration. The measured leakage shall be compared with the allowable leakage as calculated for the test section. The allowable leakage is 0.082 litres per millimetre of pipe diameter per kilometre of watermain per for the two (2) hour test period.
- 3.1.6 If the measured leakage exceeds the allowable leakage, all leaks shall be located and repaired and the test section shall be retested until a satisfactory result is obtained.
- 3.1.7 **Watermain Pressure Test Form shall be completed for all installations. Form is as shown in this section.**

E.3.2 Flushing and Disinfecting Watermains (Reference latest revisions of OPSS 441, AWWA Standard C651 (Disinfecting Watermain) and C655 (Field Dechlorination) and the most up to date Ministry of the Environment and Climate Change Watermain Disinfection Procedure:

- 3.2.1 Flushing and disinfecting operations shall be conducted under the supervision of the Township of Southgate Public Works Department. Public Works shall be notified at least two (2) business days in advance of the proposed date on which flushing and disinfecting operations are to commence.
- 3.2.2 Sodium hypochlorite solution shall be introduced so that the chlorine is distributed throughout the section being disinfected. The chlorine shall be applied so that the free chlorine concentration is 50 mg/L minimum throughout the section. The system shall be left charged with the chlorine solution for twenty-four (24) hours.
- 3.2.3 Sampling and testing for chlorine residual will be carried out by the Township of Southgate Public Works Department. The free chlorine residual will be tested in the section after twenty-four (24) hours. If tests indicate a free chlorine residual of 25 mg/L minimum, the section shall be flushed completely and recharged with water normal to the operation of the system. If the test does not meet the requirements, the chlorination procedure shall be repeated until satisfactory results are obtained.
- 3.2.4 Watermain shall be flushed in a sequence approved by the Township of Southgate Public Works Department. The Public Works may permit or require the flushing to be carried out in stages as sections of the system are completed. Flushed sections shall be protected from contamination.

- 3.2.5 The Contractor shall provide acceptable equipment and chemical additives to dechlorinate the water that must be wasted. Sulfur based dechlorination chemicals shall not be used. Dechlorination chemicals shall be ascorbic acid or sodium ascorbate. Chlorinated water discharged to the sanitary sewer shall be discharged at such a low flow rate or dechlorinated prior to discharge so that there is no possibility of chlorine residual remaining in the wastewater when it reaches the wastewater treatment facility. Total residual chlorine in water discharged into storm sewers, drainage ditches or watercourses shall not exceed 0.01 mg/L.
- 3.2.6 Recharge the watermain with Municipal water and flush via a 20 mm maximum diameter pipe for 24 hours.
- 3.2.7 After final flushing, and before the watermain is approved for connection of the new main to the existing water system, two consecutive sets of water samples, taken at least 24 hours apart, shall be collected from every 350 metres of new watermain plus one sample from the end of each line and from each branch. Certified staff from the Public Works Department shall collect the bacteriological samples.
- 3.2.8 All water samples will be collected by the Township of Southgate Public Works Department and analyzed by a certified laboratory. Two (2) - 200 mL bacteriological sample (bottles supplied by the Township ONLY) must be obtained at each location. The sample form is to be filled out requesting E. coli and Total Coliforms analysis and is to include the sampler's license number. Each sample collected must include a "Total and Free Chlorine residual" reading.
- 3.2.9 The Township will pay Laboratory expenses for the initial first set of sampling required for bacteriological results. If the disinfection fails to produce satisfactory samples, disinfection and testing shall be repeated at the contractor's expense including water usage until satisfactory samples have been obtained.
- 3.2.10 The Township of Southgate minimum requirements for acceptability of bacteriological tests are:

E-coli	0 CFU/ 100mL
Total Coliforms	0 CFU/ 100mL
Heterotrophic Plate Count (HPC)	<500 CFU/mL

E.3.3 Commissioning of New Main

- 3.3.1 When all of the tests including the bacteriological samples are satisfactory, approval from the Public Works Department for the main to be connected to the existing water system must be obtained.
- 3.3.2 All new piping and appurtenances placed in the connection of the new main and existing waterworks system must be disinfected with a minimum 1 to 5% solution of sodium hypochlorite or equivalent method.
- 3.3.3 The system shall not be put into operation until clearance has been given by the Township of Southgate Public Works Department.



Township of Southgate

Watermain Pressure Test Form (To Be Completed for All New Installations)

Project: _____ Contract No: _____

Area: _____ Date: _____

Contractor: _____

Required Test Pressure: _____

Pipe Material: _____

Diameter (mm): _____

Length Tested: _____

$$\text{Allowable Leakage in litres} = 0.082 \times \text{Dia. (mm)} \times \text{Length (m)} \text{ FOR 2 HOURS}$$

(OPSS 701.07.22.03) 1000

Minimum time test required (hours): _____

Maximum volume loss allowed for (hours): _____ (litres): _____

Actual period of time the main was under pressure (hours): _____

Actual measured volume loss (litres): _____

Test Results: Satisfactory Unsatisfactory

Comments:

$$\text{Chlorine Required in litres} = 0.039 \times \text{Dia. (m)}^2 \times \text{Length (m)} \times \frac{1}{\% \text{ Concentration of Chlorine (decimal)}}$$

(OPSS441)

Public Work's
Signature

Contractor's
Signature

Inspector's
Signature

F. ROADWAYS

The following Township of Southgate Road Design Criteria for residential roads applies to local and minor collector streets:

1. Standard Road Section:

The residential roadway section is shown on Standard Drawing R1, R2 & R3. This section designates standard locations for all Municipal Services and other utilities.

2. Geometric Standards:

Streets with a 20 m, 22 m and 26 m Right-Of-Ways will have a minimum pavement width of 8.0 m, 9.5 and 14.0 m respectively. This width does not include the concrete gutter. The minimum pavement radii for intersections shall be 10.0 m and 16.8 m on a cul-de-sac without an island. The minimum property radius on a cul-de-sac shall be 20.0 m. Cul-de-sac's with islands are not permitted. Temporary culs-de-sac are to be 12 m pavement radius with 1.2 m gravel shoulder.

The following standards are to be followed; however, specific conditions may warrant some change. Any change will require approval from the Township of Southgate.

Minimum Grade:	To maintain 0.50% minimum on gutter grade.
Maximum Grade:	8.0 %
Vertical Curves:	Vertical curves to effect gradual change between tangent grades are to be used in accordance with the MTO Geometric Design Standards.
Horizontal Curves:	Use in accordance MTO Geometric Design Standards.
Cross Fall:	2%
Asphalt Depth:	90 mm Minimum (50 mm HL4 & 40 mm HL3 compacted) on Local Residential. Refer to STD R1; 110 mm Minimum (70 mm HL4 & 40 mm HL3 compacted) on Collector & Arterial. Refer to STD R2 and R3; 75 mm Minimum (Two Lifts of HL4) on Rural Local Street; 50 mm HL4 on temporary cul-de-sac or temporary access roads
Granular Depth:	Depending on soil conditions and a geotechnical report, but no less than: 150 mm Granular "A" 450 mm Granular "B"

3. Curb and Gutter:

Concrete Curb and Gutter shall be constructed on both sides of all streets in accordance with Table 1 and Std Dwg R1, R2 & R3. Driveway cuts shall not be made until after building foundation is constructed. All cuts shall be mechanically cut in accordance with specifications approved by the Township of Southgate.

The use of temporary (throw-away) curb, constructed of low MPa concrete, is permissible and is to be replaced prior to placement of surface asphalt.

4. Sidewalks:

Concrete sidewalks that are 1.5 m wide shall be provided on both sides of residential collector and arterial streets and one side on residential local streets. Ramps shall be provided at all intersections with curb. Minimum 100 mm Granular "A" base and 125mm concrete thickness and 200mm thickness at all driveways. Tactile Warning Plates shall be provided where ever sidewalk ramps are provided at roadway and in accordance with the latest version of the Accessibility for Ontarians with Disabilities Act. Expansion joint material is to be bituminous impregnated fibreboard.

5. Walkways:

Pedestrian walkways shall be concrete, 1.8 m wide with 1.5 m minimum height black vinyl coated galvanized chain link fence on each side within property limits. Minimum R.O.W width is to be 6.0 m. If the walkway is also to be used for maintenance vehicle access, Township STD L3 and L4 is to be used.

If walkway is only for pedestrian use, bollards are to be installed 1.1 m either side of centre of sidewalk, at both ends of the walkway as per Township STD L6.

Minimum R.O.W. to be increased to a minimum of 9.0 m where underground municipal servicing exceeds one service type and a walkway exist through a corridor.

6. Boulevards:

All boulevards shall be graded, topsoiled with a minimum depth of 200 mm, and sodded from the property line to the back of curb.

7. Traffic Control and Street Name Signs:

Traffic control signs will be provided at locations designated by the Township and shall be in accordance with the "Manual of Uniform Traffic Control Devices" published by the MTO. Street name signs should be 16 cm high with a green background and white lettering (both sides), reflectorized and mounted on galvanized steel 60 mm dia. x 3.2 m posts in accordance with the Township of Southgate specifications.

8. Daylighting Triangle:

Minimum 9.0 m by 9.0 m daylighting triangle required on all intersection corners for arterial and collector streets. Minimum 7.5 m by 7.5 m daylighting triangle required on all intersection corners for local streets. Additional size may be required for special circumstances. Daylighting triangles are to be part of municipal right of way.

9. Easements:

Minimum 6.0 m easements required for single municipal services; minimum 9.0 m easements required for two municipal services. Where more than two services are to be accommodated by an easement consult with the Township for specific easement requirements.

For rear yard storm sewers 300 mm diameter or less, and catchbasins, minimum easement width to be 3.0 m. Along rear yards easement to be entirely on one property with pipe 1 m off property line. Along sideyards easement to be evenly split on both properties with pipe offset 0.5 m from property line. For storm sewers larger than 300 mm diameter consult with Township for specific easement requirements.

10. Cycling Facilities:

The design of the transportation system for the project is to consider the need and feasibility

of cycling facilities (i.e., bike lanes and trails). This issue is to be reviewed with the Township early in the project design to confirm requirements. Design of cycling facilities is to be completed in accordance with the Ontario Traffic Manual, Book 18: "Cycling Facilities" and requirements of the Township.

The Township of Southgate Standard Drawings which apply to road construction are included and/or referenced in this Manual.

G. RURAL SERVICING STANDARDS

G.1. ROADS

The Urban Servicing Standards apply to Rural Developments with the exception of the Road Design and Typical Road Cross Section (Standard Dwg. R4).

It is also the intent that the Rural Standard would be used for estate type lots. This type of development would typically be serviced by individual sewage disposal systems and wells.

G.2. WATER SUPPLY

For developments proceeding with a Rural Standard and private services, a hydrogeological report will be required to confirm the suitability of the site to support development on individual wells and septic systems (also refer to Section E1). Private wells shall be designed in accordance with current Ministry of the Environment and Climate Change Design Guidelines for Drinking Water Systems (2008) and Provincial Regulations. Source Water Protection Plans shall be taken into consideration.

G.3. WASTEWATER TREATMENT

The requirements for wastewater disposal in rural development shall be discussed in the pre-servicing report. Prior to the Township approving the Draft Plan and the issuance of Conditions of Draft Approval by the approval authority, the method for disposing of wastewater will be determined for the Development either by means of a communal sewage or individual sewage systems.

Communal sewage collection and treatment systems shall be designed in accordance with current Ministry of the Environment and Climate Change Design Guidelines for Sewage Works (2008) and Regulations and Township of Southgate standards. Individual sewage systems shall be designed in accordance with the Ontario Building Code Act and Regulation No. 332/12 as amended.

A Report outlining the soils capabilities of the site for sewage disposal shall be submitted with the Draft Plan. Additional soils testing required by the Township or the Ministry of the Environment and Climate Change will be completed as part of the design and any special requirements for construction or restricted areas shall be identified prior to Draft Plan Approval. Source Water Protection Plans shall be taken into consideration.

H. LOT GRADING

Prior to any lot grading, or alteration of land grading, or importing of fill an Application for Fill Permitting or Site Alteration shall be issued by the Township in accordance with Township By-law 2017-049.

Lot grading plans shall be prepared in accordance with the Standard Drawing G1, to the satisfaction of the Township, and as follows:

1. Lot Grading Plans must be drawn at a minimum scale of 1:500.
2. Indicate a north arrow.
3. Show a title block.
4. All elevations should be referenced to a metric geodetic municipal benchmark.
5. Show all existing and proposed lot numbers and blocks.
6. Show all proposed rear lot catch basins, pipes, top of grate elevations and inverts, and easements.
7. Show a table for a list of revisions.
8. Show existing contours.
9. Show existing and proposed elevations at lot corners.
10. Show adjacent topography and drainage patterns.
11. Show all existing structures, vegetation, natural features on, or adjacent to the subject property.
12. Indicate specified house grade, top of foundation elevations, steps in foundation, underside of basement floor elevations, underside of footing elevations, low openings and garage floor elevations including proposed driveway grade.
13. Show proposed road grades and elevations on all streets with arrows indicating direction of slope.
14. Show proposed elevations along boundary of all blocks abutting single family and semi-detached lots in the subdivision.
15. The approval of a drainage plan is related to drainage only. It is the responsibility of the developer to ensure that the drainage plan compliments the land and suits the houses to be constructed.
16. Show all temporary erosion control measures to be in place during the construction period and permanent erosion control works to be left in place after construction.
17. The maximum side slopes on swales should be 3 horizontal to 1 vertical. All swales must have a minimum depth of 150 mm. Swales within the development are to be centered on property lines. Swales abutting other properties are to be constructed entirely within development lands.
18. The maximum slope of all embankments should be 3:1. Where grades greater than 3:1 are proposed a retaining wall should be constructed. All 3:1 or steeper slopes are to be indicated on the plan, clearly defining the limits of the slope.

19. The proposed direction of overland flow shall be indicated on the plans by arrows. High points and all changes in grade are to be clearly noted on the plan, with spot elevations.
20. The Township Engineer may require details of all terracing and slope treatment and in depth cross-sections to be provided, with the lot grading plan.
21. All Regional Flood and Fill Lines, verified by the Conservation Authority, must be indicated on lot grading plans where developments are adjacent to existing or established watercourses.
22. Topsoil shall be stripped in all cut and fill areas and stockpiled for reuse during final lot grading operations.
23. All fill and surplus soils shall be managed by a Qualified Person, in accordance with By-Law 2017-049 and Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act Ontario Regulation 406/19.
24. Multiple unit blocks are subject to approval through the site plan approval process, individual site plan agreements are required for each block.

The Drainage Plan shall indicate the proposed grading of all the lands to be developed and how all the lands adjacent to the subdivision which drain through the property are to be accommodated.

I. UTILITIES AND LIGHTING

All hydro, telephone and other utilities shall be underground and placed in accordance with current local utility company regulations and standards. Provide Composite Utility Plan to the Township for review.

Satisfactory evidence that the Developer has entered into an agreement providing for the installation of underground hydro and street lighting must be submitted to the Township of Southgate prior to the execution of a Subdivision Agreement.

All developments shall be provided with street lighting in accordance with the current requirements of the local utility companies and the Township of Southgate.

All materials and installation shall meet or exceed current O.P.S.S. standards and the requirements of the local utility supplier. The materials and supplier shall be reviewed with the Township prior to approval and samples shall be supplied if requested.

All utility installations within the Municipal right-of-ways are required to obtain a Municipal Consent Approval from the Township. Prior to issuance of Municipal Consent, the following is required:

- Composite Utility Plan (CUP) is to be prepared and submitted to the Township for review and approval. The CUP is to reflect all utilities to be installed within the municipal right-of-ways.
- All utility agencies must review and approve the CUP with respect to their specific utility in the context of the CUP (i.e., Sign-offs).
- Submission to Township to include CUP, original utility plans and agency Sign-offs.

Discussion with utilities will occur regarding placement of utilities in the boulevard, specifically natural gas routing around hydro transformer locations. Refer to Standard Drawing U1.

1. Street Lighting Design

Lighting designs (light levels, uniformity ratios, etc.) shall be based on the latest version of American National Standards Institute/Illuminating Engineering Society of North America's American National Standard Practice for Roadway Lighting; (ANSI/IESNA RP-8 latest revision).

Roadway lighting must provide uniform lighting at a level that is adequate and comfortable for vehicular and pedestrian movement on the roads and sidewalks. All roadway lighting systems shall be designed by an Engineer experienced in roadway lighting. Designs shall be carried out using the luminance method as described in RP-8 (latest revision) (unless noted otherwise) by a qualified engineer, while incorporating the Township standards and specifications as given below. Design calculations with photo metric layouts shall be prepared by utilizing one of the following approved lighting and design programs: AGI 32 and Autolux.

As per the current roadway lighting policy, all proposed lighting shall be reviewed and approved by the Township. Lighting design submissions to the Township must include:

- a) Photometric distribution diagram
- b) design criteria used
- c) design calculations
- d) contract drawings and specifications
- e) manufacturers literature

All roadway lighting design and construction must satisfy Electrical Safety Authority (ESA) requirements, and is subject to ESA inspection and approval. All materials used for roadway lighting must meet Canadian Standards Association (CSA) specifications.

2. Material Specifications

All roadway lighting equipment used must meet the Township's roadway lighting standards and specifications. It shall be the responsibility of the street lighting contractor to ensure they have the latest revisions of the Township's Street lighting specifications and list of approved suppliers prior to ordering any materials. All street lighting components are to be manufactured in accordance with the Township's requirements as amended from time to time.

Unless otherwise indicated, all electrical materials shall be new and of uniform pattern throughout the work and ESA shall approve all materials, components or completed assemblies of components.

2.1 Street Light Poles:

Street light poles shall be concrete. Height of poles shall be determined by lighting system designers. For "cobra head" combinations, the pole shall be Class B centrifugally cast round concrete pole and have a mold finish. For decorative combinations, the pole shall be centrifugally cast concrete. Developers shall submit manufacturer's literature for the proposed standard and decorative poles to the municipality for approval. All poles must meet CSA specifications and are subject to Electrical Safety Authority (ESA) inspection and approval.

2.2 Luminaires:

All luminaires shall be light emitting diode (LED) lamps and shall come complete with a bird stop. Luminaires are to be 3000k temperature and must meet CSA and electrical code requirements and are subject to ESA inspection and approval. The luminaires shall be manufactured by Phillips, General Electric (GE) or Cree. The style and design of the fixtures shall be submitted to the municipality for approval.

2.3 Brackets:

All street light brackets must meet CSA specifications and are subject to ESA inspection and approval. Standard street light brackets for use with "cobra head" luminaires shall be manufactured in accordance with the latest revisions of ANSI C136.1. Brackets shall be a 1.8 m or 2.4 m tapered elliptical aluminum bracket as needed for the lighting design. Decorative street light brackets shall be manufactured in accordance with the latest revisions of ANSI C136.1 with the changes necessary to apply to arms for decorative fixtures. Decorative brackets shall be 1.5m or 1.8m nominal curved bracket. The style and design of the bracket shall be submitted to the municipality for approval.

2.4 Photo-Electric Controllers:

Photo-electric controllers shall be suitable for use with LED fixtures. Controllers shall be electronic twist lock with the following features:

- A filtered (human eye spectral response) silicon light sensor with infrared blocking filter;
- MOV surge protection;
- Rated for 120 volts;
- Load rating: 1000 watts, 1800vA ballast;
- Turn on level at 1.5 FC and turn off at 1.5 times turn on;
- Operating temperature range from -40°C to 70°C

Photo-electric controllers must be manufactured using non-hazardous materials.

All photo-electrical controllers must meet CSA specifications and are subject to ESA inspection and approval.

2.5 Loadcentres & Pedestals:

The Township requires the ESA mandated disconnect for street lighting systems. The disconnect shall be provided by means of a service entrance rated loadcentre (pedestal type for underground systems and pole-mounted units for overhead systems) with stainless steel weather proof enclosure (minimum NEMA 4X rated) and complete with:

- 60 amp, 22 kAIC, 120 V / 240 V double-pole line side main breaker, and
- 40 amp, 120 V single-pole load side breakers (quantity: up to 6)

Pedestals shall not be metered.

2.6 Street Lighting Cable Duct:

Street light cable duct shall be 50 mm (2") Type II PVC, direct buried duct meeting CAN/CSA-C22.2 NO.227.1 (latest revision). All ducts must meet CSA specifications and are subject to ESA inspection and approval.

2.7 Street Light Wiring from the Handpole to the Luminaire:

Street light wiring from the handhole to the luminaire shall be 2 - #12 copper NMWU plus 1 - #12 copper ground, CSA approved.

2.8 Street Lighting Distribution Cable from Loadcentre to Street Light Poles:

The street light cable from the loadcentre to the pole and from pole to pole shall consist of the following:

- 2 - #6 copper, RWU-90-CSA complete with 1 - #6 jacketed green ground (for 120V);
- 3 - #6 copper, RWU-90-CSA complete with 1 - #6 jacketed green ground (for 240V)

Cable shall be CSA approved.

2.9 Street Light Power Cable from Transformer to Loadcentre:

The street light supply cable feed from the transformer to the street light loadcentre shall be 3 - #2 copper RWU-90-CSA with 1 - #2 ground. Cable shall be CSA approved.

2.10 Grounding Rods and Plates:

Ground rods shall be solid steel, 19 mm diameter, 3 m long, copper clad for the full length and shall be according to CSA C22.2 No. 41.

Ground plates shall present not less than 0.2 m² of surface to exterior soil and be not less than 6 mm thick as per the Electrical Code. The plates shall be made of hot dip galvanized solid steel. Steel shall be according to CAN/CSA G40.20/G40.21, Grade 230G and shall be galvanized according to CAN/CSA G164.

The number of grounding rods and grounding plates shall be determined by the lighting system design engineer.

3. Electrical Drawings:

The electrical layout drawings are a schematic representation of the requirements. All equipment shall be installed in locations detailed in the contract.

4. IES Illumination and Luminance Design Criteria:

The illuminance method of roadway lighting calculations determines the amount or quality of light incident on the roadway surface and the luminance method of roadway lighting calculations determines how 'bright' the road is by determining the amount of light reflected from the pavement in the direction of the driver. Design criteria shall be in accordance with the requirements of ANSI/IES RP-8 (latest revision).

5. Lighting for Intersections:

The luminance method is difficult to use with the design of lighting for intersections due to the basic assumptions inherent in luminance design and the methods used in its calculation. Therefore, illuminance criteria and calculations are recommended for use in the design of intersections. Intersections should be illuminated to a level equal to the sum of the recommended average illumination levels for each of the intersecting roads. Refer to Table 8 in ANSI/IES RP-8-14 as amended.

At a minimum, all lane changes (additions or subtractions), left or right turn lanes, median islands, etc. should be adequately illuminated and are recommended to be included in the illumination design calculations.

Typical lighting layouts for intersections are given in ANSI/IES RP-8 (latest revision) and in the Transportation Association of Canada's (TAC) "Intersections Lighting", (latest revision).

6. Dark Sky Compliance:

Without forgoing the above, all lighting is to be dark sky compliant, shielded where necessary and shall minimize the amount of light pollution to the extent feasible at the discretion of the Township, or illumination bylaw as applicable. This can be accomplished by:

- Only being on and placed where needed for safety, security or useability;
- Not brighter than necessary, with blue light emissions minimized;
- Using energy efficient lighting such as LED's;
- Fully shielded and pointing downward.

7. Light Trespass:

The basic light trespass requirements as per the current acceptable practice, the vertical illuminance values should be limited to a maximum of 3.0 lux at a height of 1.5m above finished grade along the property line.

8. Road/Entrance Crossings:

The street lighting ducts shall be heavy wall PVC or polyethylene duct with a minimum cover of 1200 mm under roadways and all commercial and industrial driveways. The ducts shall be installed in accordance with the requirements of the Township of Southgate. Where a road crossing is required on a project that does not include road reconstruction, it shall be installed via a trench less method.

9. Walkways. Pathways and Trails:

Requirements for the lighting of walkways, pathways and trails for a specific project are to be confirmed in consultation with the Township. Quality and quantity of light is to meet Illumination Engineering Society (IES) standards for the specific application. Lighting design is to ensure light trespass onto adjacent properties or into adjacent areas that are to be kept dark at night time achieve basic light trespass requirements as per the current acceptable practice. Note: This section is not applicable to sidewalks within road right-of-ways, which are to be addressed as part

of the street lighting design.

10. Electric Vehicle Charging Stations (EVCS):

Any EVCS installed are to be designed and completed by a Licensed Electrical Contractor in compliance with the Ontario Electrical Safety Code (OESC) using only either ESA approved equipment, or those certified for use in Canada by a nationally recognized certifier (i.e., CSA, cUL, cETL)

Any EVCSs that will be Municipally owned are to be a minimum Level 2 (240 volt) and installation is to be approved by the Hydro utility. Provision of Level 3 EVCS should further be considered if sufficient servicing is available.

Wherever a EVCS is provided, reserved EVCS signs are to be provided in accordance with the *Reserved Parking for Electric Vehicles Charging Act, 2019* and *Section 27.1(1) of Reg 615*.

11. Installation:

11.1 General:

The contractor shall ensure that the construction and installation of the street lighting system will be completed in a good and workmanlike manner and in accordance with Township standards.

Street lights shall be located on the boulevard in accordance with the Township's standard cross sections and as shown on the CUP, trenching plans and typical road sections while maintaining proper clearances from fire hydrants, driveways, transformer and switching units and trees or any other services.

The street lighting power supply is to be supplied to each street light loadcentre in accordance with ESA requirements.

The entire street light installation is subject to inspection and approval by the ESA. The contractor is responsible for applying and obtaining said inspection. Hydro One shall make the connections inside the transformer once the following steps have been fulfilled:

- Approval has been given by the ESA, and a Connection Authorization has been received by Hydro One. The Township requires a copy of the ESA authorization.
- The contractor has arranged for a Megger testing of the system, and a copy of the successful test report has been submitted to the Township. The developer has sent a request for connection letter to Hydro One.

Hydro One shall notify the Township and the Developer once the street light system connection at the transformer has been completed. The Township shall then energize the street light system at the loadcentre and inspect the system operation. Any deficiencies shall be reported by the Township to the contractor for rectification.

11.2 Cable:

Street light cables shall be installed in conformity with Township standards. The cable shall be installed in 50 mm (2") Type II PVC, direct buried duct with a minimum of 600 mm cover. As per the Electrical Code, a 6" wide red plastic warning tape is to be installed with black lettering stating "ELECTRIC LINE BURIED BELOW". This warning tape is required to be installed midway between the topmost conductor and final grade above all conductors within the trench.

Where the street light poles are not in place at the time of the cable installation, the end of the cable shall be coiled and staked at the intended pole location in a similar manner to

the secondary service cables except that at least 3 m of cable shall be left above grade. Where the cable is to continue on to another light, the cable shall be looped and not cut and at least 6 m in total shall be left above grade.

Cables are to be inserted into the poles via the cable access ports and the ground wire shall be connected to the internal ground lug at the hand hole by means of a #6 AWG compression connector lug.

All connections to ground and to the luminaire conductors are to be made at the hand hole and taped or otherwise insulated after installation.

All connections inside the transformer shall be made by Hydro One.

11.3 Street Light Cable Duct:

In general, the ducts shall be placed in accordance with applicable Ontario Provincial Standard Specifications (OPSS) and Drawings (OPSD) for underground electrical distribution systems. In general, the street light duct shall be placed in the common trench on the same level as the secondary and/or communication cables, and on the road side of the trench, with a minimum of 600 mm cover.

When street light ducts are placed under driveways, the top 300 mm of the backfill shall be compacted to 100% Standard Proctor Density with granular "A".

Street light duct placed under roadways shall be installed in accordance with OPSD 2100.06.

A ¼" Polypropylene fish rope is to be pulled into each duct.

11.4 Poles:

Installation of street light poles are to be in accordance with applicable OPSD Series 2200 (Foundation) drawings and the manufacturer's requirements.

In general, poles are to be installed in augured or vactored (high pressure water evacuation method) holes to the depths given in the above referenced drawings. The bottom of the hole must be cleaned of loose material before placing the pole.

The Contractor shall take care to ensure that no damage occurs to the electrical or street lighting system or other utilities during the installation of street light poles.

11.5 Luminaires, Brackets and Photo Controllers:

Installation of street light luminaires and brackets shall be in accordance with the manufacturer's requirements. In general, luminaires and brackets are to be installed and wired prior to the pole being erected.

The photo-electric controller shall be positioned to face north.

The contractor shall take care to ensure that no damage occurs to the pole, luminaire, bracket or wiring during their assembly and erection.

11.6 Grounding:

A minimum of two (2) rods must be installed adjacent to the street light loadcentre pedestal/pole, at least 0.3m below final grade and connected to the bonded neutral block of the service entrance and must be spaced no less than 3 m apart in accordance with the Electrical Code requirements.

Alternatively, a ground plate must be installed adjacent to the street light loadcentre pedestal/pole at least 0.6 m below final grade level and connected to the bonded neutral block of the service entrance.

A ground rod/plate shall also be installed at the last street light pole of every circuit and bonded to the pole's internal ground. The number of ground rods/plates for each street lighting circuit shall be determined by the design engineer.

Either system is acceptable providing the installation conforms to the Electrical Code requirements.

J. LANDSCAPING

1. Boulevards:

All boulevards shall have between 200 mm and 300 mm depth of topsoil plus sod.

2. Parks:

All parks shall have between 200 mm and 300 mm depth of topsoil, seed and mulch.

Seed mix shall be as follows:

Type	Amount
Nu Blue Kentucky Bluegrass	25%
Baren Kentucky Bluegrass	25%
Herald Creeping Red Fescue	15%
Wilma Chewing Fescue	10%
Pinnacle Turf Type Per Rye	25%

- Seed shall be applied at a rate of 1.5-1.7 Kg/100 square metres.
- All topsoil shall be in conformance with OPSS 570.

3. Trees:

- a) Trees shall be planted in front of every lot on the Municipal Right-Of-Way at a location 300 mm from the street Property Line.
- b) On corner lots a tree shall be planted every 15 m on the adjacent sideyard on the flanking street.
- c) Trees are to be planted so as not to interfere with other street functions or services when the tree matures. Where it is not possible to conform with the foregoing, the trees shall be planted at locations approved by the Municipality.
- d) Planting of trees shall be as detailed on Std. Dwg. L-1 and L-2. They shall be watered at time of planting and every two weeks thereafter up to the expiration of the guarantee period. The guarantee period shall be one year from the date of planting and the period for planting shall be Spring and Fall only.
- e) All trees shall be No. 1 nursery stock, 2.5 m minimum height with a minimum caliper of 60 mm measured 300 mm above ground level.

All areas for planting shall be stabilized with sod or seed as required, prior to planting of trees.

4. Species:

Alternate species shall be provided on all streets. A species list shall be provided and approved for each street, prior to any planting.

The species that are approved for planting on Municipal property shall include the following:

Scientific Name	Common Name
Acer Nigrum	Black Maple
Acer rubrum	Red Maple
Acer Saccharum	Sugar Maple
Aesculus Hippocastanum	Common Horse Chestnut
Gleditsia Triacanthos Var. Inermis "Halica" Honeylocust	Honey Locust
Gleditsia Triacanthos Var. Inermis Sunburst Locust	Sunburst Locust
Pyrus Calleryana	Redspire Pear
Tilia Cordata	Glenleven Linden
Acer x freemanii 'Jeffersred'	Autumn Blaze Maple
Celtis occidentalis	Common Hackberry
Quercus macrocarpa	Bur Oak
Quercus rubra	Red Oak
Tilia americana 'Redmond'	Redmond Basswood
Ulmus americana 'Princeton'	Princeton Elm

5. Park and Recreational Areas:

The Township may request that the Park or Recreational Areas dedicated for the development be provided with a suitable entrance, sanitary and water services, parking lot and be graded and seeded so that they are suitable for recreational use.

The area to be dedicated for park use shall be reviewed with the Township on submission of the Preliminary Draft Plan. Requirements for entrances, grading and seeding will be finalized at time of engineering drawing review. The Township may also request that a different area than that proposed by the Developer be set aside for a park due to the physical features of site.

6. Fencing:

Fencing shall be installed where there are varying land uses on adjacent properties. Fencing shall be installed as required in public parks, open spaces, natural heritage features, school properties, utility corridors, along flankages and/or rear yards abutting collector or arterial roads, and higher density development and/or as deemed appropriate by the Township. Where fencing is required between residential and non-residential properties, fencing shall be placed 0.1m on the non-residential side of the property line. Fencing is not required where noise barrier walls are to be installed or as separation between public properties like parks, storm water management ponds, ROWs and open space areas. All fencing must conform to Township and/or OPSS standards and OPSS drawings.

Temporary fencing and construction fencing is required, as directed by the Township. Fencing to be conveyed to Township through plan of subdivision, site plan, severance or other means will require certification from an Ontario Land Surveyor to verify that the fencing is located as per approved drawings and standards.

Gates are not permitted to provide access from private properties to public open space, properties such as woodlots, parks, Storm Water Management ponds, channels or utility corridors from individual residential properties or development blocks. Gating to restrict public vehicle access is required, where emergency and maintenance services require infrequent access. P-Gates or bollards may be required by the Township to manage public safety, provide site servicing and the maintenance of public property.

6.1 Design

a) Construction Fencing

i) Tree Protection Fencing:

Should be 1.2 m high page wire fencing with caution signs to be placed 1.0m beyond at the drip line of the trees to be protected. (Std. Dwg. F-1). In some situations, the Township may require tree protection hoarding due to sensitive nature areas of the existing vegetation to be protected during construction (Std. Dwg. F-2)

ii) Sediment and Erosion Fencing:

Must be installed on the construction side of the posts, prior to and maintained during construction. (Refer to OPSD219.130 and OPSD219.131)

b) Permanent Fencing

i) Black Vinyl Chain Link Fencing:

- Required along rear or side yards adjacent to public open space, including open space, walkways, parkland, stormwater management blocks, utility corridors and servicing blocks
- Fencing is to be 1.5 metre high, located 0.1 metres on Township property (Std. Dwg. F-3)
- Along rear or side yards adjacent to utility corridors fencing is to be 1.5 metre high, located on property line (Std. Dwg. F-3). Owner must consult with utility companies prior to installation to receive locates of underground utilities.
- Adjacent to school properties the fencing requirements of properties abutting school board lands requires consultation with the local school board.
- Adjacent to other institutional, commercial or industrial properties.
- Fencing may be required for entrances or natural features abutting the municipal ROW.
- All chain link fencing to be installed as per OPSD 972.130 / 972.132 and OPSS 772.
- Gates are not permitted in required fencing.

ii) Galvanized Chain Link Fencing:

- Galvanized chain link fencing is required for and only permitted for sports field applications as per the Township's standard drawings and installed as per OPSD and OPSS.

c) Privacy Fencing

- Must be installed adjacent to residential flankages and/ or rear yards which abut collector and arterial roads, and be 1.8 metre high wood board-on-board privacy fence. Fencing is to be on property line (Std. Dwg. F-4).
- Privacy fencing is required between residential and industrial/commercial/ institutional properties.
- Where privacy fencing is required between private properties, fencing is to be 1.8 m high wood board-on-board privacy fence, located on the property line (Std. Dwg. F-4).
- Fencing is not required where acoustic barriers are to be installed.
- Fence returns with gates are required.

d) Highway (Page Wire) Fencing

- Must be installed with 150mm (6 in.) diameter wood posts with page wire fencing (OPSD 971.101)
- Page wire fencing may be required as temporary and/or protective fencing to protect park blocks, adjacent agriculture lands, woodlot, open space, future development blocks or corridors at the Town's discretion.
- Required between private lands and natural heritage features; between private lands and agricultural lands.
- May also be required between public lands and natural heritage features; public lands and agricultural lands. This to be determined on a site specific basis at the Township's discretion.
- Gates are not permitted in required fencing unless specifically approved by the Township.

e) Post and Cable

At road crossings adjacent to utility corridors, post and cable fencing or other barrier is required to the satisfaction of the utility company and the Township (Std. Dwg. F-5). The Town may require installation at other locations.

Note: The Standard Drawings included as attachments to this Perimeter Fencing Standards are the following:

- Std. Dwg. F-1 – Tree Protection Fencing
- Std. Dwg. F-2 – Tree Protection Hoarding
- Std. Dwg. F-3 – Chain Link Fencing
- Std. Dwg. F-4 – Wood Privacy Fencing
- Std. Dwg. F-5 – Post and Cable Fencing

K. SPECIFICATIONS

All Municipal Services shall be constructed in accordance with specifications approved by the Township of Southgate.

L. REVISIONS TO SERVICING STANDARDS

Holders of this Manual may receive copies of all revisions from the Township of Southgate. Since the Design Criteria and Standard Drawings could be revised, the Consulting Engineer should ensure that the Manual is up-to-date before commencing design work on a specific project.

STANDARD DRAWINGS

Where the Ontario Provincial Standard Drawing No. has been indicated, this Standard shall apply. Where a Township of Southgate Standard Drawing No. has been indicated in addition to the Ontario Provincial Standard Drawing No., the latter shall be read in conjunction with the Township of Southgate Standard. Should there be an inconsistency between the Standards; the Township of Southgate Standard shall take precedence.

The Township of Southgate reserves the right to update its Standards from time to time and any person using them should ensure they have a copy of the current listing prior to proceeding with a project.

In all cases, the latest revisions of the Standard Drawings as of the date the design is completed shall be used. For the Township of Southgate Standards, the Standard number includes the month and year of the latest revision of the Standard.

Table 1: Standard Drawings		
Title	Ontario Provincial Standard Drawing (Latest Revision)	Township of Southgate Standard
Pipe Bedding – Granular “A” Cover Material-Granular “A” or sand	802.010.802.013 802.030.803.033	-
M.H. Frame and Cover a) Standard – Sanitary b) Standard – Storm c) Watertight – Sanitary	401.010 (Type “A”) 401.010 (Type “B”) 401.030	-
Catchbasin Frame and Grate	400.110	-
Rear Yard Catchbasin Frame and Grate	400.120	
Ditch Inlet Catchbasin Honeycomb Grate	403.010	Special where required
M.H.Steps	405.010 (Hollow Circular Aluminum)	-
Safety Platform Aluminum	404.020	-
Sewer Service Connections	1006.010	S4
M.H. (precast)	Section 700 & 1000	-
Catchbasins M.H. (precast)	Section 700	-
M.H. Benching	701.021	-
Water Service	1104.010, 1104.020	-
25mm Blow Off Installation	-	W1
Valve and Box	1101.020	W2
Hydrant Setting	1105.010	W3
Connection of New Watermain to existing Watermain		W4, W5
Spacer for Water Meter		W6
Thrust Blocks	1103.010, 1103.020	-
20m Right-of-Way	-	R1
22m Right-of-Way	-	R2
26m Right-of-Way	-	R3
Typical Rural Section (20m Right-Of-Way)	-	R4
Concrete Sidewalk (125mm Concrete) (100 mm Granular “A” minimum)	310.010	-
Sidewalk Ramps	310.030, 310.033, 310.039	-
Barrier Curb and Gutter	600.040	-
Asphalt Gutter	601.010	-
Tree Protection Fencing	220.010	F1
Tree Protection Hoarding	220.010	F2
Wood Privacy Fencing	-	F3
Chain-Link Fencing	972.030	-
Lot Grading Detail	-	G1
Typical Servicing Layout Singles & Semi Detached	-	S1
Typical Servicing Layout Semi Detached & Multi Units	-	S2
Sump Pump / Storm Connection	-	S3
Sanitary Service Connection Typical Depth	-	S4
Sanitary Service Connection Sewer > 4m Deep		S5

Table 1 (Continued): Standard Drawings		
Title	Ontario Provincial Standard Drawing (Latest Revision)	Township of Southgate Standard
Transformer Location & Easement Size with Gas 0.3m Off Property	-	U1
Transformer Location & Easement Size with Joint Utility Trench	-	U2
Boulevard Tree Detail	-	L1
Boulevard Tree Detail	-	L2
Trail Barrier Gate	-	L3
Stainless Steel Security Barrel/Pin	-	L4
Maintenance Access Gate	-	L5
Permanent and Removable Bollard	-	L6

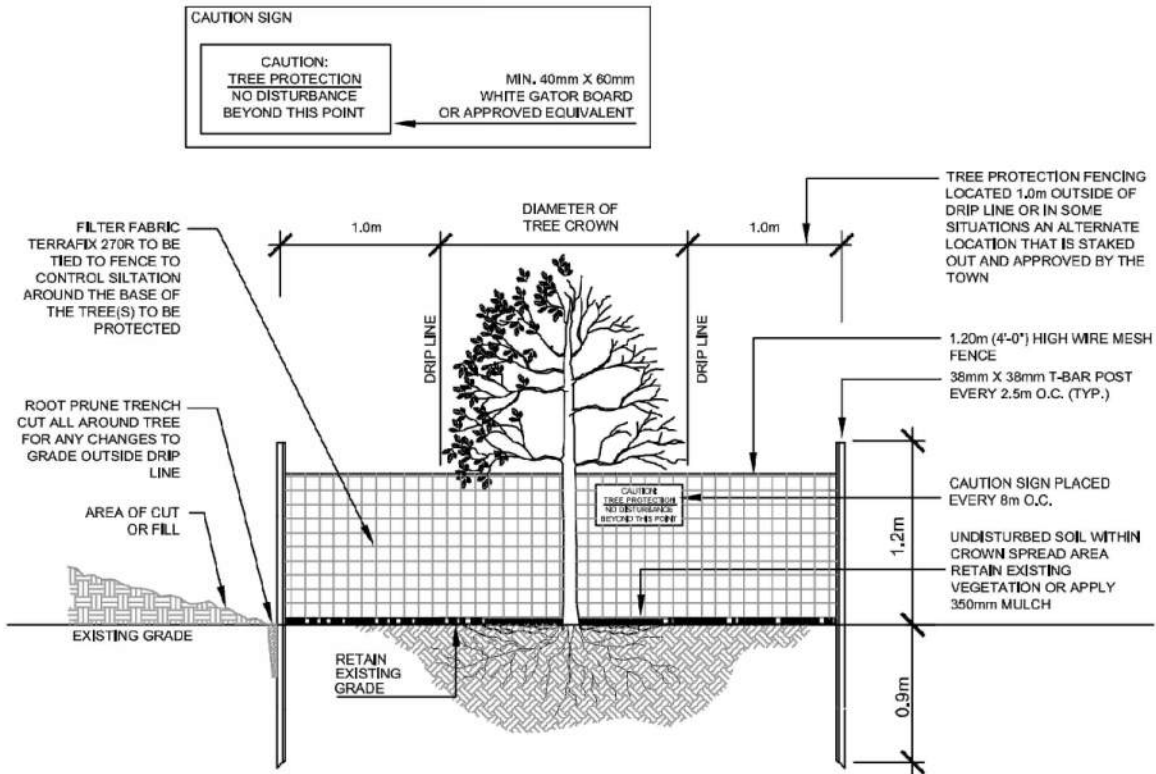
*M.H. = maintenance hole

APPROVED MATERIALS AND PRODUCTS

Table 2: Approved Materials and Product List		
Service	Item	Approved Products
SANITARY	Sewer Pipe	PVC DR 35 Concrete CSA#A257.1/A257.2 (latest revision)
	Service Pipe	PVC DR 28
	Connections	Kor-N-Seal for manholes, Prefab tees for PVC pipe or Kor-N-Tee for concrete pipe services
STORM	Sewer Pipe	375 mm diameter or less: <u>PVC DR 35</u> - IPEX "Ultra Rib" - Loc Pipe "Loc PVC" <u>Concrete</u> CSA A257.1 (latest revision) (non-reinforced), and A257.2 (latest revision) (reinforced). <u>HDPE</u> Big 'O' Boss Polytite - Royal Rib "Korflo" 450 mm diameter or greater: <u>Concrete</u> CSA A257.1 (latest revision) (non-reinforced) and A257.2 (latest revision) (reinforced) Leads to rear yard catchbasins are to be concrete. All culverts shall be galvanized CSP, (minimum 1.6 mm thickness) or HDPE Boss 2000, 320 kPa stiffness c/w Ultra Stab 75 Joint
	Service Pipe	PVC DR 28
	Connections	Kor-N-Seal for manholes Prefab tee for HDPE and PVC pipe or Kor-N-Tee (services for Concrete pipe only)
WATER	Watermain	Ductile Iron ANSI A21.51 (latest revision) AWWA C151 (latest revision) with Tyton Joints Cement Lined with Copper Straps C900 PVC Class 235 (DR 18), B 137.3 (latest revision) and Tracer Wire Bionax PVCO C909 PVC (Associated fittings and restraints shall be approved by the (Township) and Tracer Wire

Table 2: Approved Materials and Product List		
Service	Item	Approved Products
	Valves	<p>Mueller Resilient Wedge Gate Valve AWWA C509 (latest revision), mechanical joint with:</p> <ul style="list-style-type: none"> - fusion-bonded epoxy coating, AWWA C550 (latest revision) - bronze stem - open counter clockwise <p>Clow Resilient Wedge Valve AWWA C509 (latest revision), F-6100 mechanical joint with:</p> <ul style="list-style-type: none"> - fusion-bonded epoxy coating, AWWA C550 (latest revision) - bronze stem - open counter clockwise <p>American AVK Co., Series 25 Resilient Seated Gate Valve AWWA C509 (latest revision), mechanical joint with:</p> <ul style="list-style-type: none"> - fusion-bonded epoxy resin coating, AWWA C550 (latest revision) - standard stainless steel stem - open counter clockwise
	Hydrants	Canada Valve Century Compression Type Valve Seats, or Clow Canada Brigadier Heritage Style Hydrant with McAvity M59M shape, both with "Storz" pumper connection.
	Corporation Main Stop	<p>Cambridge Brass, Ball Style, Series 301NL (No Lead), AWWA X CB Compression Assembly,</p> <p>Mueller Canada, Mueller 300, Ball Type, No Lead, B-25008, AWWA x Mueller "CC" Compression assembly</p> <p>Ford Meter Box Company, Ball Style, FB-1000-NL, No Lead, AWWA x "CC" Compression assembly</p>
	Curb Stop	<p>Cambridge Brass, Ball Style, Series 202NL (No Lead), CB Compression x CB Compression assembly.</p> <p>Mueller Canada, Mueller 300, Ball Type, No Lead, Mueller "CC" x Mueller "CC" compression assembly</p> <p>Ford Metter Box Company, Ball Style, B44 Series, No Lead, "CC" compression assembly</p>
	Saddle	<p>Cambridge Brass, Series 8403, Type 304 Stainless Steel, Double Bolt, AWWA Thread</p> <p>Robar 2616DB, Type 304 Stainless Steel, Double Bolt, AWWA Thread,</p> <p>Ford Meter Box Company, FS323, Type 304 Stainless Steel, Double Bolt, AWWA Thread</p> <ul style="list-style-type: none"> • Band width for services 25mm in diameter or less shall be a minimum of 150mm • Band width for services greater than 25mm in

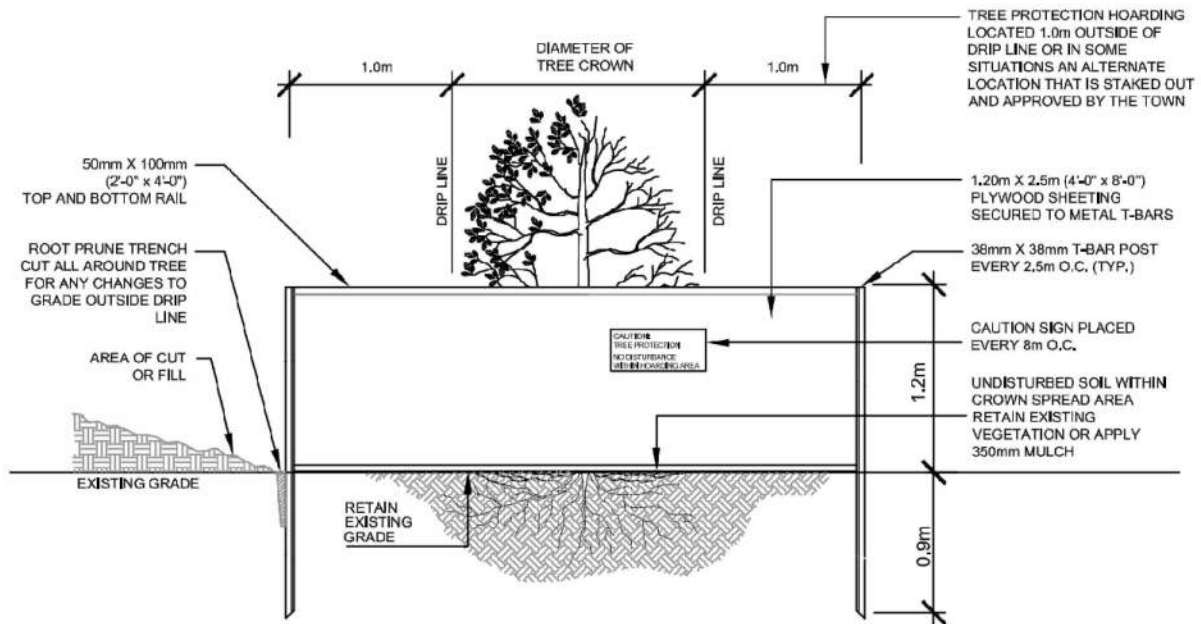
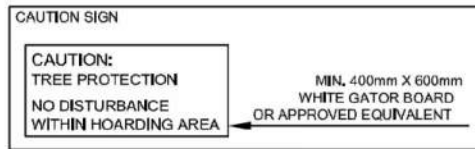
Table 2: Approved Materials and Product List		
Service	Item	Approved Products
		diameter shall be a minimum of 200mm Rods and pins shall be stainless steel.
	Mechanical Joint Restraints	<ul style="list-style-type: none"> - Uni-Flange Series 1300 manufactured by Ford Meter Box Company, Inc. - Megalug Series 1100 for ductile iron pipe - Megalug Series 2000 PV for PVC C900 pipe - Stargrip Series 3000 for ductile iron pipe - PVC Stargrip Series 4000 for PVC C900 pipe - Sigma ONE-LOK Series SLCE for PVC pipe
	Tracer Wire	Refer to Section E2. Attached to underside of bottom flange of fire hydrant (Std. Dwg. No. W3)
	Water Service Material	<p>Copper Seamless Type "K" for services less than or equal to 20.0 m in length</p> <p>Cross-Linked Polyethylene ("Municipex" by Rehau and "Blue904" by Ipex) for services greater than 20m in length</p>



NOTES:

1. TREE PROTECTION FENCING AND ASSOCIATED FILTER FABRIC IS TO BE MAINTAINED IN GOOD WORKING ORDER THROUGHOUT CONSTRUCTION PERIOD UNTIL APPROVAL TO REMOVE THE FENCING IS OBTAINED BY THE TOWNSHIP OF SOUTHGATE.
2. EXISTING TREES SHALL BE PROPERLY PROTECTED WITHIN THE DRIP LINE WITH WIRE MESH FENCING AS PER THE APPROVED LANDSCAPE PLAN UNTIL SUBSTANTIAL PERFORMANCE OR REPLACEMENT WITH A PERMANENT FENCE.
3. STEEL T-BAR TO HAVE MIN. 2.5 m O.C. SPACING.
4. MAINTAIN EXISTING GRADE WITHIN DRIP LINE OF ALL TREES TO BE PRESERVED.
5. PRUNE DEAD WOOD ONLY AS DIRECTED BY THE TOWNSHIP. DO NOT PRUNE LEADERS.
6. WATERING AND FERTILIZING PROGRAM SHALL BE MAINTAINED TO THE SATISFACTION OF THE TOWNSHIP.
7. THE COST OF REPLACING DEAD AND SEVERELY DAMAGED TREES, AS DETERMINED BY THE TOWNSHIP, SHALL BE BORNE BY THE DEVELOPER AND/OR GENERAL CONTRACTOR. THE SPECIES AND SIZE(S) MUST BE APPROVED BY THE TOWNSHIP.
8. ENSURE POSITIVE DRAINAGE AWAY FROM THE FENCED AREA.
9. NO STORAGE OR MATERIALS OR GRADE CHANGES ARE TO OCCUR WITHIN THE FENCED AREA.

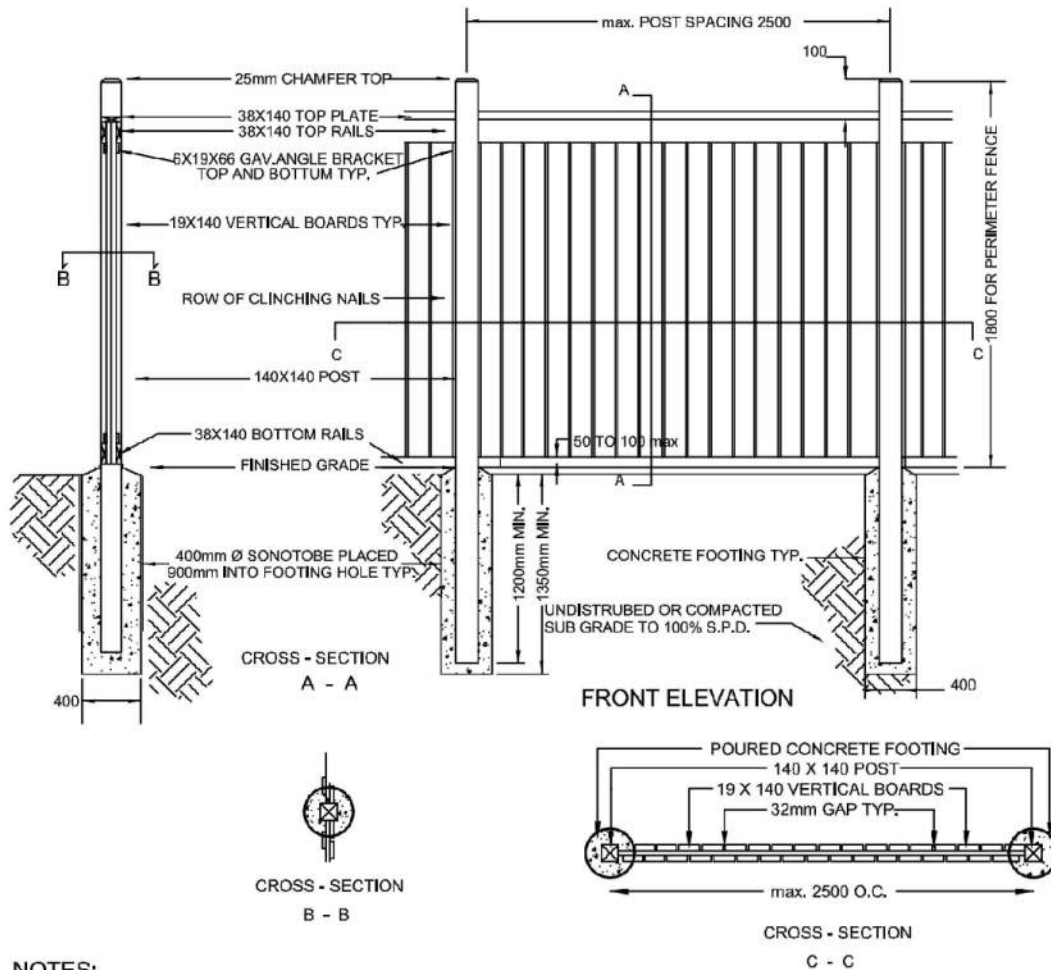
TOWNSHIP OF SOUTHGATE	DATE SEPTEMBER 2021	REV. 0
	TREE PROTECTION FENCING	



NOTES:

1. TREE PROTECTION HOARDING IS TO BE MAINTAINED IN GOOD WORKING ORDER THROUGHOUT CONSTRUCTION PERIOD UNTIL APPROVAL TO REMOVE HOARDING IS OBTAINED BY THE TOWNSHIP OF SOUTHGATE.
2. EXISTING TREES SHALL BE PROPERLY PROTECTED WITHIN THE DRIP LINE WITH HOARDING AS PER THE APPROVED LANDSCAPE PLAN UNTIL SUBSTANTIAL PERFORMANCE OR REPLACEMENT WITH A PERMANENT FENCE.
3. STEEL T-BAR TO HAVE MIN. 2.5 m O.C. SPACING.
4. MAINTAIN EXISTING GRADE WITHIN DRIP LINE OF ALL TREES TO BE PRESERVED.
5. PRUNE DEAD WOOD ONLY AS DIRECTED BY THE TOWNSHIP. DO NOT PRUNE LEADERS.
6. WATERING AND FERTILIZING PROGRAM SHALL BE MAINTAINED TO THE SATISFACTION OF THE TOWN.
7. THE COST OF REPLACING DEAD AND SEVERELY DAMAGED TREES, AS DETERMINED BY THE TOWN, SHALL BE BORNE BY THE DEVELOPER AND/OR GENERAL CONTRACTOR. THE SPECIES AND SIZE(S) MUST BE APPROVED BY THE TOWN.
8. ENSURE POSITIVE DRAINAGE AWAY FROM THE HOARDING AREA.
9. NO STORAGE OF MATERIALS OR GRADE CHANGES ARE TO OCCUR WITHIN THE HOARDING AREA.

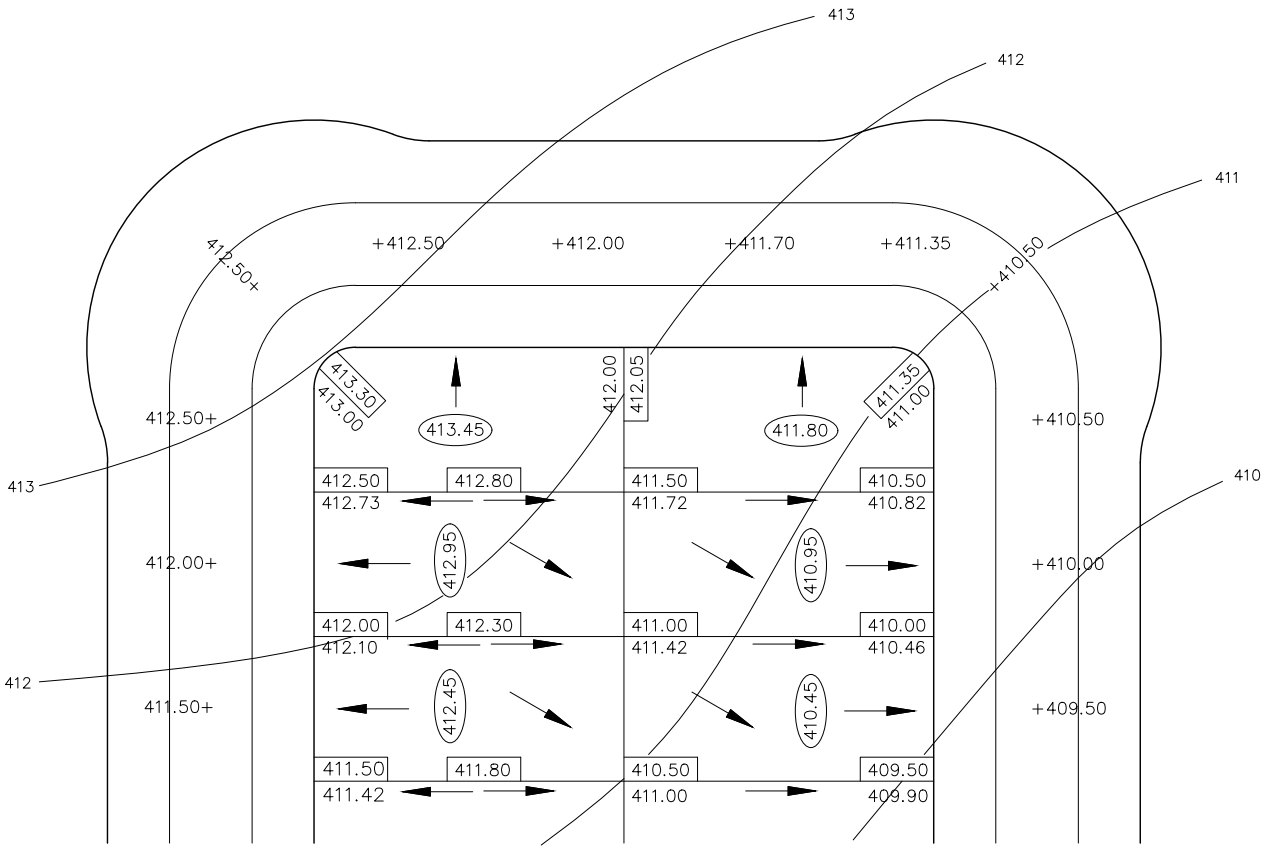
TOWNSHIP OF SOUTHGATE	DATE SEPTEMBER 2021	REV. 0
TREE PROTECTION HOARDING	STD. F2	



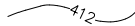



NOTES:

1. ALL MATERIALS, COMPONENTS AND WORKMANSHIP TO CONFORM TO BUILDING CODE AND LOCAL BY-LAWS.
2. ALL WOOD TO BE PRESSURE TREATED S.P.F OR SELECT WESTERN CEDAR. ALL MEMBERS SHALL BE FREE OF WANE AND BARK POCKETS. ALL TORN GRAIN SHALL BE ELIMINATED BY SANDING AND PLANING. MEMBERS EXHIBITING MODERATE TO HEAVY KNOTS SHALL BE WELL-DISTRIBUTED THROUGHOUT THE INSTALLATION. PANEL MEMBERS SHALL BE SELECT KNOTTY (NLGA 204A). POST SHALL BE SELECT STRUCTURAL POST AND TIMBER (NGLA 131A)
3. ALL WOOD TO BEAR GRADING STAMP OF C.L.S. CERTIFIED AGENCY.
4. MOISTURE CONTENT OF WOOD SHALL NOT EXCEED 19% AT THE TIME OF CONSTRUCTION.
5. TREAT BOTTOM SKIRT BOARDS WITH C.C.A. PRESERVATIVE TO A RETENTION OF 4.0 KG/C.M.
6. CLEAR STAIN FOR WOOD FENCE SHALL CONSIST OF A BASE OF BLENDED RESINS AND OILS IN A WATER SUSPENSION. SUSPENDED SOLIDS WHICH ARE NOT LESS THAN 21% AND NOT GREATER THAN 31% BY VOLUME. VOC's (VOLATILE ORGANIC COMPOUNDS) WHICH ARE NOT IN EXCESS OF 350 g/L IN ACCORDANCE WITH ASTM-2369.
7. STAIN APPLICATION - APPLY TWO COATS ON CLEAN DRY WOOD AT A TEMPERATURE OF 5-21 DEGREES C.
8. NAILS SHALL BE GALVANIZED ARDOX CONFORMING TO CSA STANDARDS BILL.
9. LAG SCREWS AND BOLTS SHALL BE GALVANIZED AND SHALL CONFORM TO ASTM A307.
10. ALL GALVANIZING TO BE HOT DIPPED IN CONFORMANCE TO CSA STANDARD G164.
11. COUNTERSINK ALL LAG SCREWS AND BOLTS AND DRIVE ALL NAIL HEADS BELOW SURFACE OF WOOD. USE SUFFICIENT SIZE AND QUANTITY OF NAILS TO ENSURE A STABLE AND SECURE STRUCTURE.
12. MAINTAIN FINISHED GRADE PARALLEL WITH BOTTOM FENCE MEMBER.
13. STEP FENCE PANELS MAXIMUM OF 150mm AT POSTS AS REQUIRED BY GRADE CONDITIONS.
14. ALL LUMBER SIZES ARE ACTUAL SIZES RATHER THAN NOMINAL SIZES.
15. CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 30 MPA @ 28 DAYS WITH 5-7% AIR ENTRAINMENT.
16. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED

TOWNSHIP OF SOUTHGATE	DATE SEPTEMBER 2021	REV. 0
WOOD PRIVACY FENCING	STD. F3	



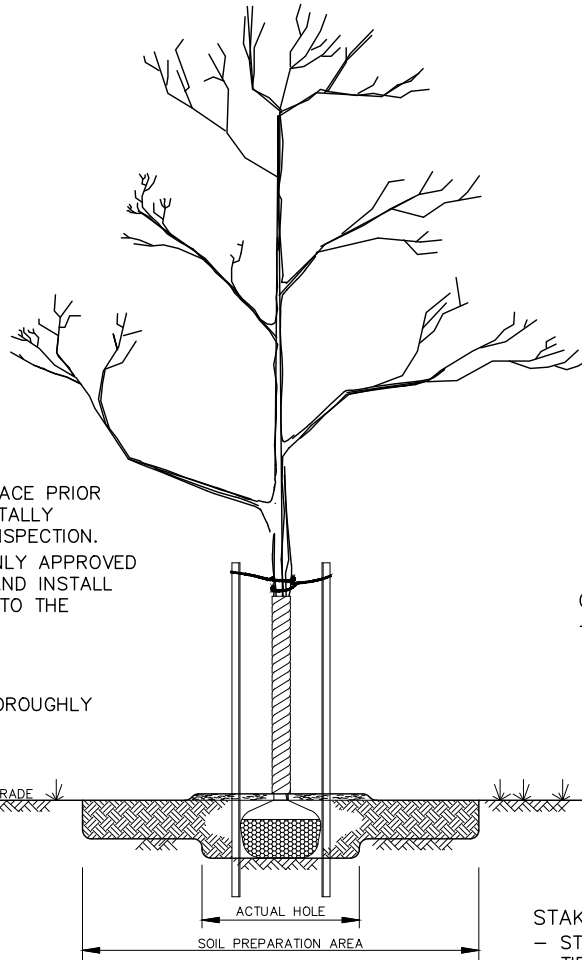
LEGEND

- 412.73 EXISTING LOT CORNER ELEV.
-  412 EXISTING CONTOURS @ 1m OR LESS
- +410.50 PROPOSED C ROAD ELEV. @ 20m STA.
-  411.45 PROPOSED LOT CORNER ELEV.
-  PROPOSED SURFACE DRAINAGE & DIRECTION
-  411.95 PROPOSED GRADE @ BUILDING

REQUIREMENTS

- DRIVEWAY GRADES 1% – 6%
- WALKWAY GRADES 2% – 6%
- LOT GRADES 2% – 6%
- BUILDING GRADE 450mm HIGHER THAN HIGHEST FRONT LOT CORNER
- ALL SIDE & REAR YARD SWALES TO BE ON LOT LINES, MIN. GRADE 2%, MIN. DEPTH 150mm, MAX. SLOPE 3:1
- MAX. DISTANCE WITHOUT CATCHBASIN TO BE 75m.

TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
LOT GRADING PLAN GENERAL		STD. G1



TRUNK PROTECTION:

- TRUNK WRAPPING IN PLACE PRIOR TO PLANTING TO BE TOTALLY REMOVED FOR TRUNK INSPECTION.
- WHEN REQUIRED USE ONLY APPROVED TREE WRAP MATERIAL AND INSTALL FROM THE GROUND UP TO THE LOWEST BRANCHES.

WATERING:

- ENSURE TREES ARE THOROUGHLY WATERED AT PLANTING.

MULCHING:

- MULCH WITH SHREDDED BARK OR COMPOSTED HARDWOOD CHIPS TO A MAXIMUM DEPTH OF 75mm, OVER AN AREA OF THE ROOTBALL. KEEP MULCH 150mm AWAY FROM TRUNK.
- FOR OTHER TYPES OF MULCHING, REFER TO SPECIFICATIONS.

PLANTING AREA:

- ACTUAL HOLE TO BE 300mm WIDER AROUND PERIMETER OF ROOTBALL.
- SOIL PREPARATION AREA TO BE 5X ROOTBALL DIAMETER.
- SCARIFY SOIL PREPARATION TO A DEPTH OF 300mm FOR AERATION.

IMPORTANT:

SOME OR ALL NOTES MAY NOT APPLY TO THE SPECIAL REQUIREMENTS OF A SPECIES OR A PLANTING ENVIRONMENT.

SOIL AMENDMENT:

- EXISTING TOPSOIL TO BE AMENDED WITH TRIPLE-MIX WHERE REQUIRED.

PLANTING SOIL:

- HOLE TO BE BACKFILLED AND CONCURRENTLY TAMPED AND WATERED TO ELIMINATE AIR POCKETS.

PLANTING DEPTH:

- IN HEAVY CLAY OR POORLY DRAINED SOIL, ALL WOODY PLANTS TO BE PLACED SO THAT THE ROOT COLLAR IS POSITIONED 75-100mm HIGHER THAN SURROUNDING GRADE.

CROWN PRUNING:

- PRUNE AT PLANTING TO CAREFULLY REMOVE DEAD, BROKEN, DAMAGED & INTERFERING BRANCHES, DOUBLE LEADERS & NARROW ANGLE BRANCH UNIONS. THIN HEAD WHEN & WHERE APPLICABLE.

STAKES AND TIES:

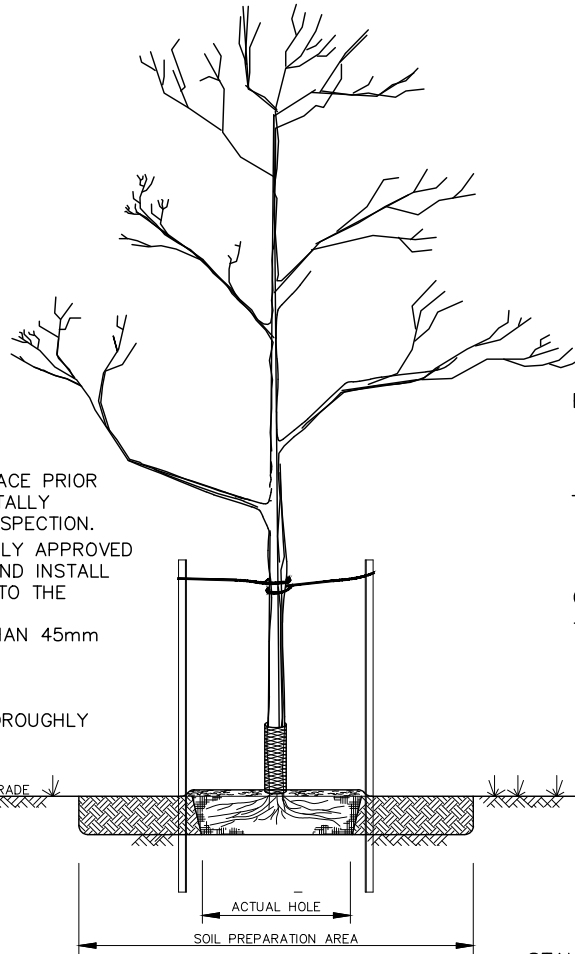
- STAKE IMMEDIATELY.
- TIE USING BIODEGRADABLE MATERIAL SUCH AS FOLDED BURLAP, ETC.
- STAKES TO BE PLACED TO PREVENT DAMAGE TO ADJACENT BRANCHES.
- USE 50mm x 50mm x 2m WOOD STAKES OR METAL T-BARS DRIVEN SECURELY INTO GROUND. ALIGN STAKES WITH PREVAILING WINDS.
- APPLY RODENT PROTECTION WHERE REQUIRED.

ROOTBALL, BURLAP, TWINE:

- CUT AND REMOVE ALL WIRE, ROPE, BURLAP AND TWINE FROM AROUND TRUNK AND THE TOP 1/3 OF THE ROOTBALL.

BACKGROUND INFORMATION PROVIDED FROM LANDSCAPE ONTARIO.

TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
DECIDUOUS TREE PLANTING DETAIL	STD. L1	



TRUNK PROTECTION:

- TRUNK WRAPPING IN PLACE PRIOR TO PLANTING TO BE TOTALLY REMOVED FOR TRUNK INSPECTION.
- WHEN REQUIRED USE ONLY APPROVED TREE WRAP MATERIAL AND INSTALL FROM THE GROUND UP TO THE LOWEST BRANCHES.
- WRAP TREES LARGER THAN 45mm CALIBER.

WATERING:

- ENSURE TREES ARE THOROUGHLY WATERED AT PLANTING.

SOIL AMENDMENT:

- EXISTING TOPSOIL TO BE AMENDED WITH TRIPLE-MIX WHERE REQUIRED.

PLANTING SOIL:

- HOLE TO BE BACKFILLED AND CONCURRENTLY TAMPED AND WATERED TO ELIMINATE AIR POCKETS.

PLANTING DEPTH:

- PLANT TO BE PLACED SO THAT THE ROOT COLLAR IS POSITIONED AT THE SAME LEVEL AS IN THE NURSERY FIELD.
- CARE SHOULD BE TAKEN TO AVOID EXCESSIVE SETTLEMENT OF ROOTS FOLLOWING PLANTING.

CROWN PRUNING:

- PRUNE AT PLANTING TO CAREFULLY REMOVE DEAD, BROKEN, DAMAGED & INTERFERING BRANCHES, DOUBLE LEADERS & NARROW ANGLE BRANCH UNIONS. THIN HEAD WHEN & WHERE APPLICABLE.

MULCHING:

- MULCH WITH SHREDDED BARK OR COMPOSTED HARDWOOD CHIPS TO A MAXIMUM DEPTH OF 75mm, OVER AN AREA OF THE ROOTBALL. KEEP MULCH 150mm AWAY FROM TRUNK.
- FOR OTHER TYPES OF MULCHING, REFER TO SPECIFICATIONS.

PLANTING AREA:

- ACTUAL HOLE TO BE 300mm WIDER AROUND PERIMETER OF ROOT SYSTEM.
- SOIL PREPARATION AREA TO BE 5X ROOT DIAMETER.
- SCARIFY SOIL PREPARATION TO A DEPTH OF 300mm FOR AERATION.

STAKES AND TIES:

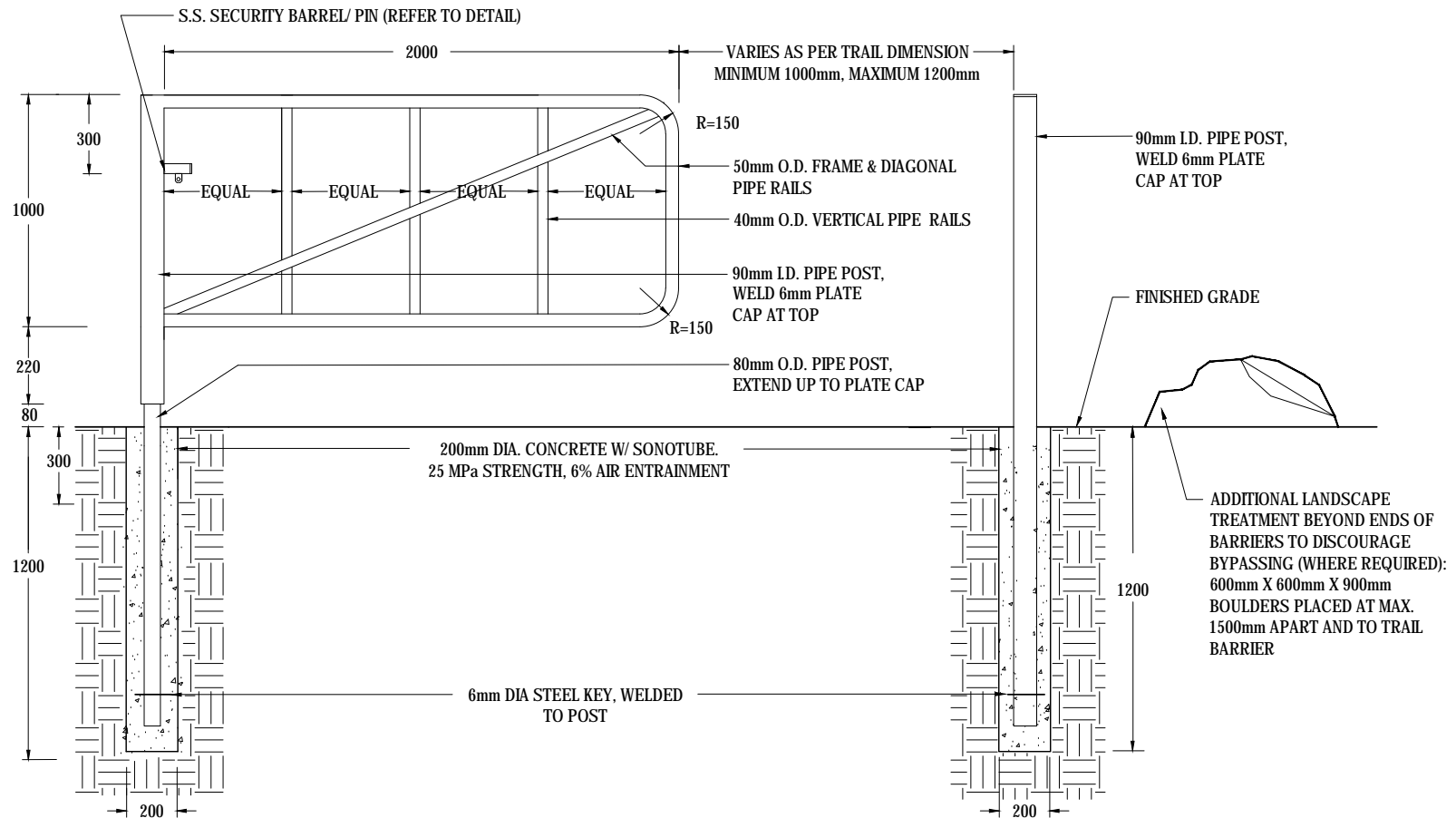
- STAKE BEFORE PLANTING.
- TIE USING BIODEGRADABLE MATERIAL SUCH AS FOLDED BURLAP, ETC.
- STAKE TO BE PLACED TO PREVENT DAMAGE TO ADJACENT BRANCHES.
- USE 50mm x 50mm x 2m WOOD STAKE OR METAL T-BAR DRIVEN SECURELY INTO GROUND. ALIGN STAKE WITH PREVAILING WINDS.
- APPLY RODENT PROTECTION WHERE REQUIRED.

IMPORTANT:

SOME OR ALL NOTES MAY NOT APPLY TO THE SPECIAL REQUIREMENTS OF A SPECIES OR A PLANTING ENVIRONMENT.

BACKGROUND INFORMATION PROVIDED FROM LANDSCAPE ONTARIO.

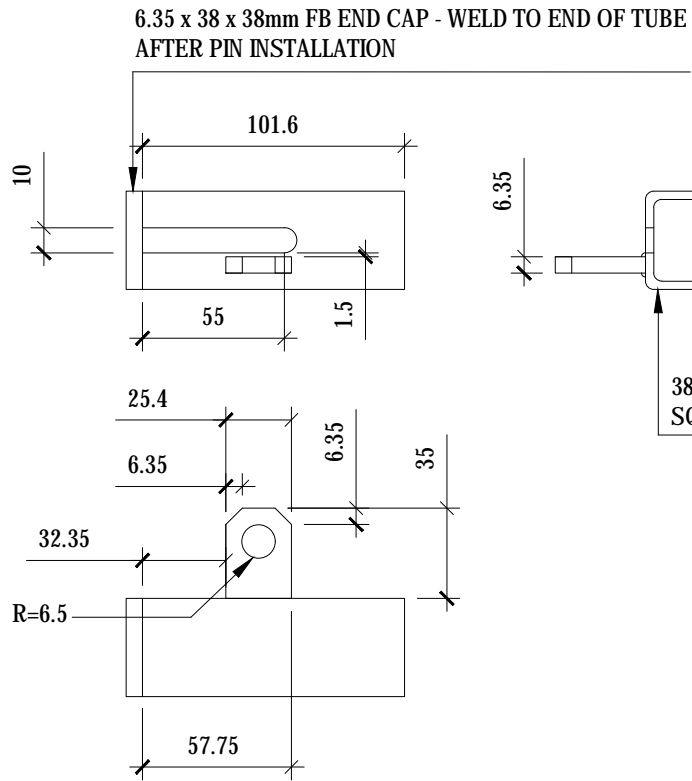
TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
	BARE-ROOT TREE PLANTING DETAIL	



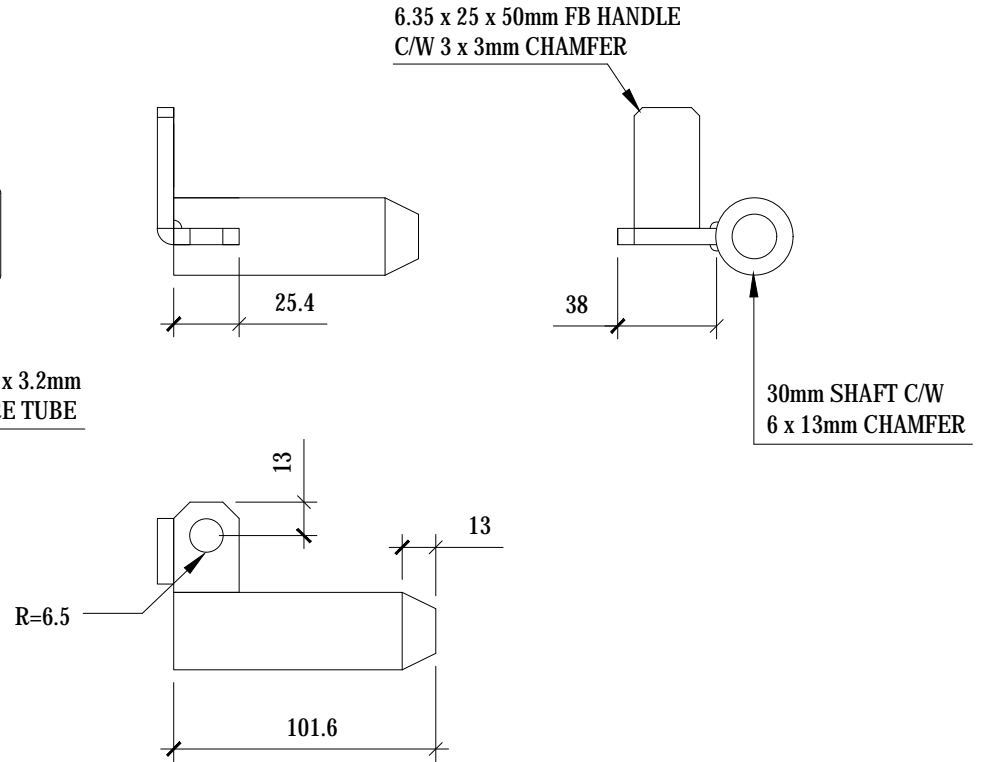
NOTES:

- ALL GATE METAL EXCEPT S.S. SECURITY BARREL/PIN TO BE SCHEDULE 40 STEEL PIPE, HOT DIP GALVANIZED TO MEET CSA-G164-M1981 AFTER FABRICATION. ALL WELDS TO MEET CSA W59-M1989 AND BE GROUND SMOOTH. TOUCH UP ALL MINOR DAMAGED AREAS WITH ZINC BASED PAINT AFTER INSTALLATION. POSITION DRAINAGE HOLES TO MINIMIZE WATER INGRESS; FILL HOLES IF DIRECTED BY TOWNSHIP REPRESENTATIVE.
- EXACT LOCATION OF GATE AND ANY ADDITIONAL LANDSCAPE TREATMENTS TO BE AS DIRECTED ON SITE BY TOWNSHIP REPRESENTATIVE.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH DRAWING L4, STAINLESS STEEL SECURITY BARREL/PIN FOR TRAIL BARRIER GATE.

TOWNSHIP OF SOUTHGATE	DATE JAN, 2016	REV. 0
	TRAIL BARRIER GATE	
STD. L3		



BARREL DETAIL

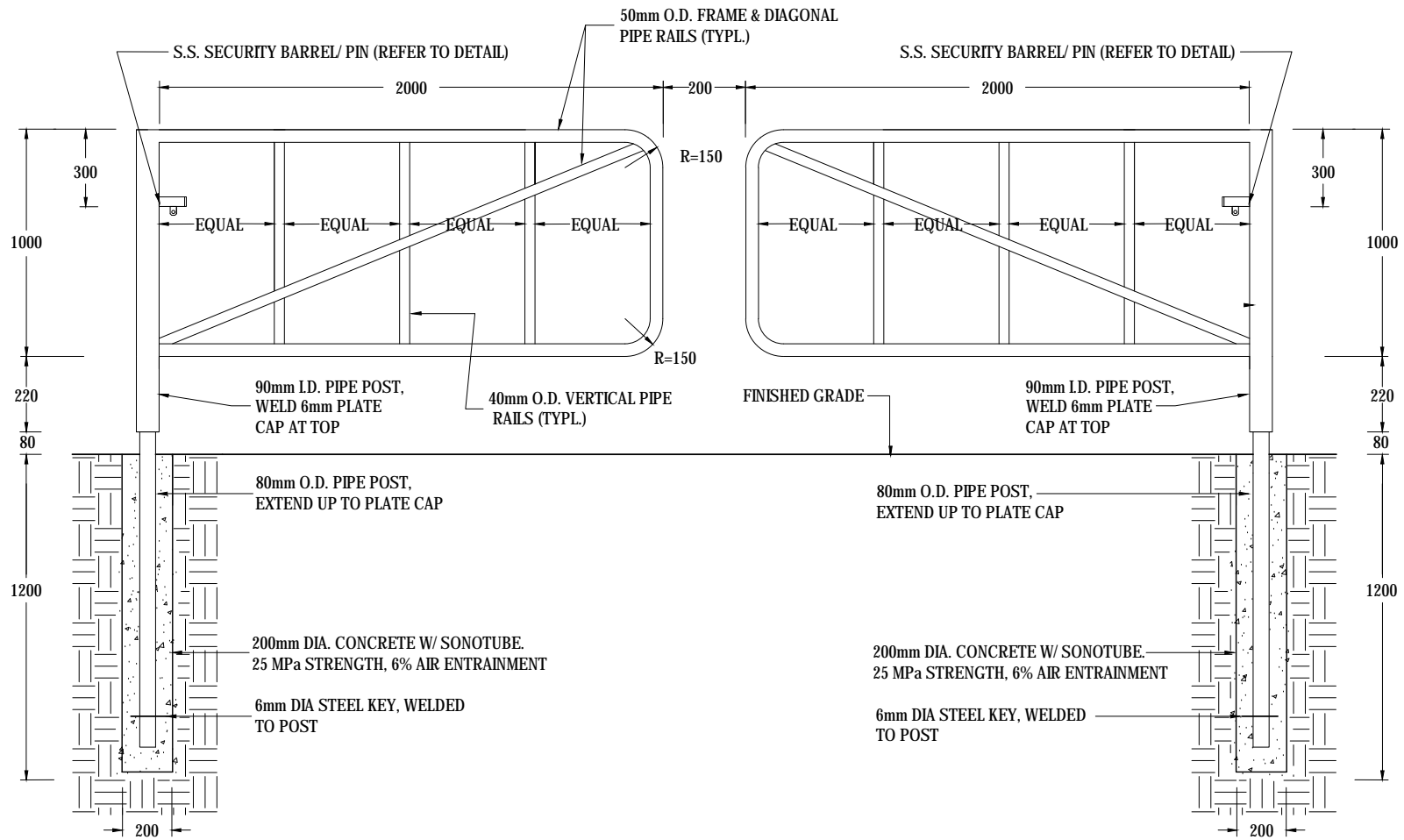


PIN DETAIL

NOTES:

- REMOVE GALVANIZING FROM GATE AT BARREL/PIN WELD AREA AND FULLY COAT WELD SURFACE WITH ZINC BASED PAINT OVERLAPPING ONTO STAINLESS STEEL.

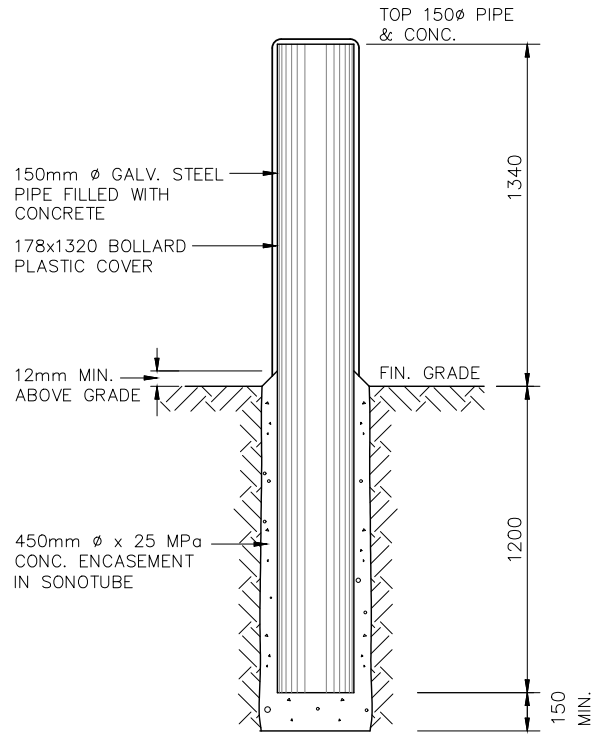
TOWNSHIP OF SOUTHGATE	DATE JAN, 2016	REV. 0
STAINLESS STEEL SECURITY BARREL/PIN FOR TRAIL BARRIER GATE & MAINTENANCE ACCESS GATE	STD. L4	



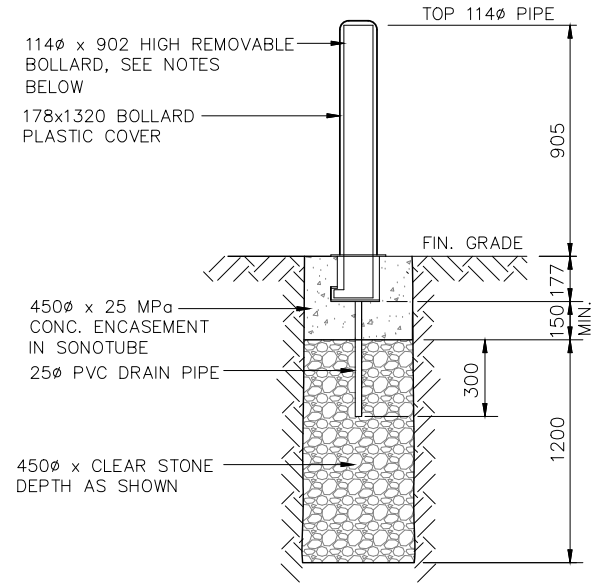
NOTES:

- ALL GATE METAL EXCEPT S.S. SECURITY BARREL/PIN TO BE SCHEDULE 40 STEEL PIPE, HOT DIP GALVANIZED TO MEET CSA-G164-M1981 AFTER FABRICATION. ALL WELDS TO MEET CSA W59-M1989 AND BE GROUND SMOOTH. TOUCH UP ALL MINOR DAMAGED AREAS WITH ZINC BASED PAINT AFTER INSTALLATION. POSITION DRAINAGE HOLES TO MINIMIZE WATER INGRESS; FILL HOLES IF DIRECTED BY TOWNSHIP REPRESENTATIVE.
- EXACT LOCATION OF GATE AND ANY ADDITIONAL LANDSCAPE TREATMENTS TO BE AS DIRECTED ON SITE BY TOWNSHIP REPRESENTATIVE.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH DRAWING L4, STAINLESS STEEL SECURITY BARREL/PIN FOR TRAIL BARRIER GATE.

TOWNSHIP OF SOUTHGATE	DATE JAN, 2016	REV. 0
MAINTENANCE ACCESS GATE	STD. L5	



PERMANENT BOLLARD DETAIL
NOT TO SCALE



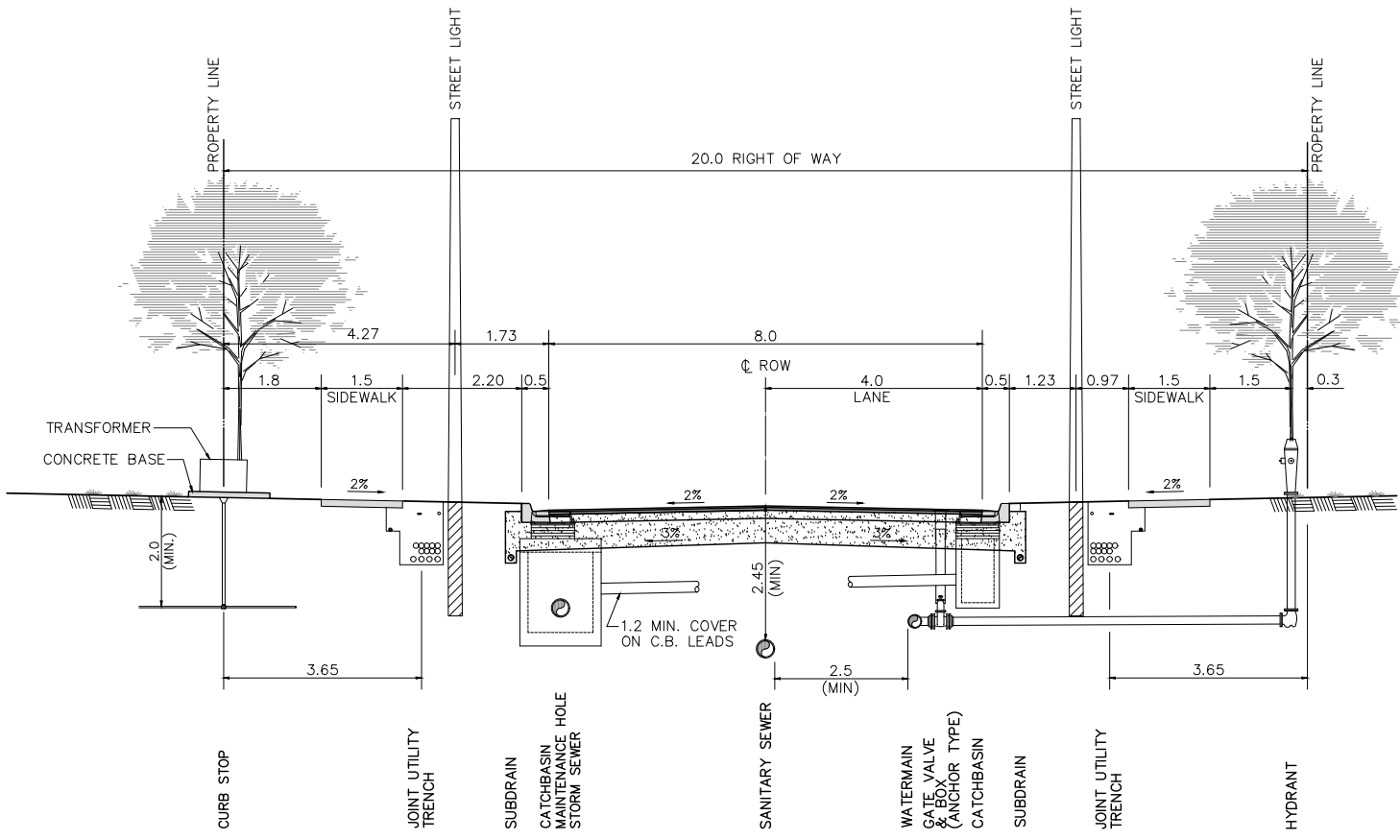
REMOVABLE BOLLARD DETAIL
NOT TO SCALE

NOTES:

1. - REMOVABLE BOLLARD TO BE STAINLESS OR GALV. STEEL AS SUPPLIED BY ONTARIO BOLLARDS, GEORGETOWN, ONTARIO
2. - BOLLARD PLASTIC COVERS AS SUPPLIED BY ONTARIO BOLLARDS, GEORGETOWN, ONTARIO, COLOUR AS SELECTED BY OWNER.

TOWNSHIP OF SOUTHGATE	DATE AUGUST, 2021	REV. 0
	PERMANENT & REMOVABLE BOLLARD	

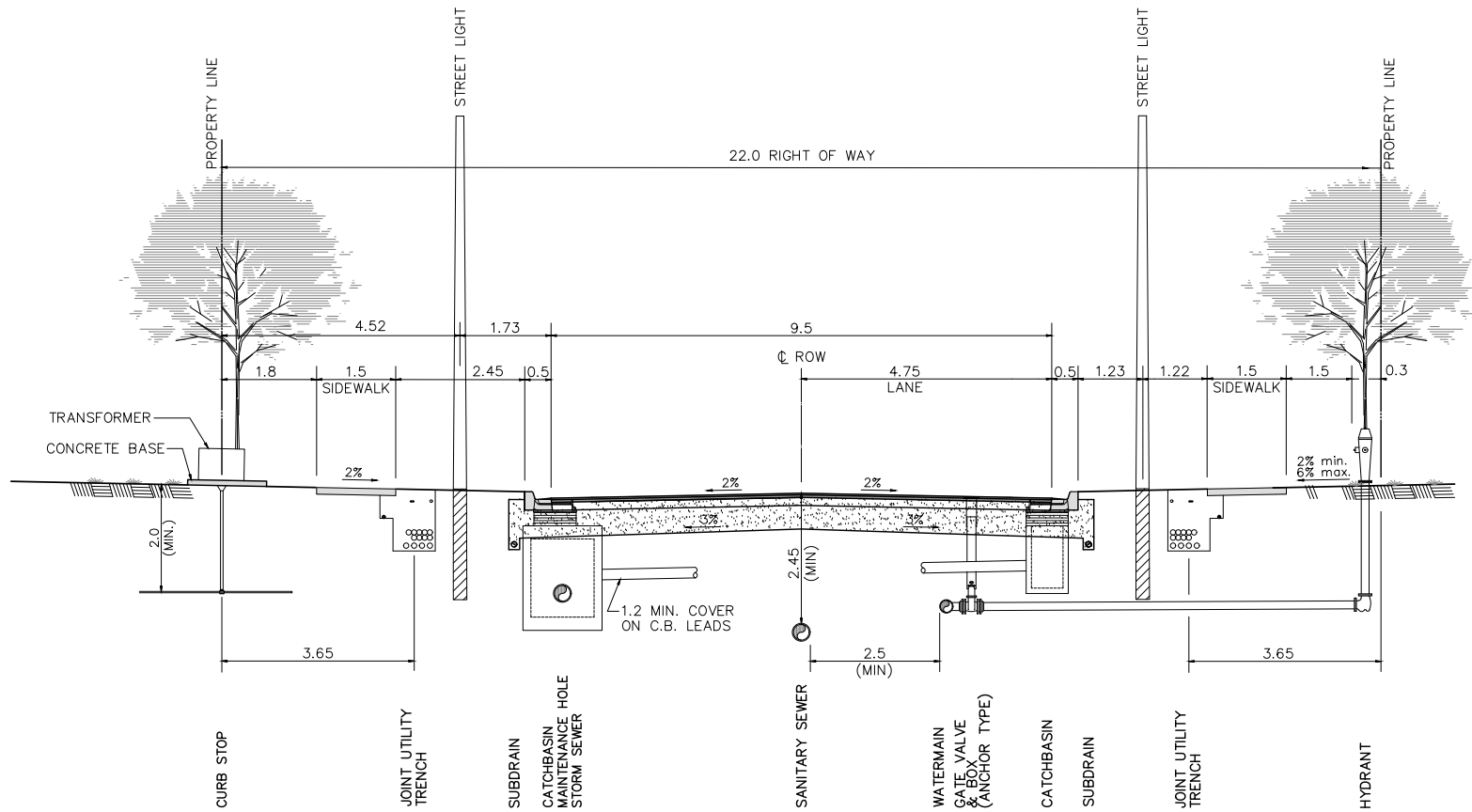
STD. **L6**



NOTES:

1. LOCATE HYDRO TRANSFORMER AS PER STANDARD U1 OR U2
2. TREE PLANTING 0.3m FROM PROPERTY LINE
3. SIDEWALK REQUIRED ON ONE SIDE ONLY
4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

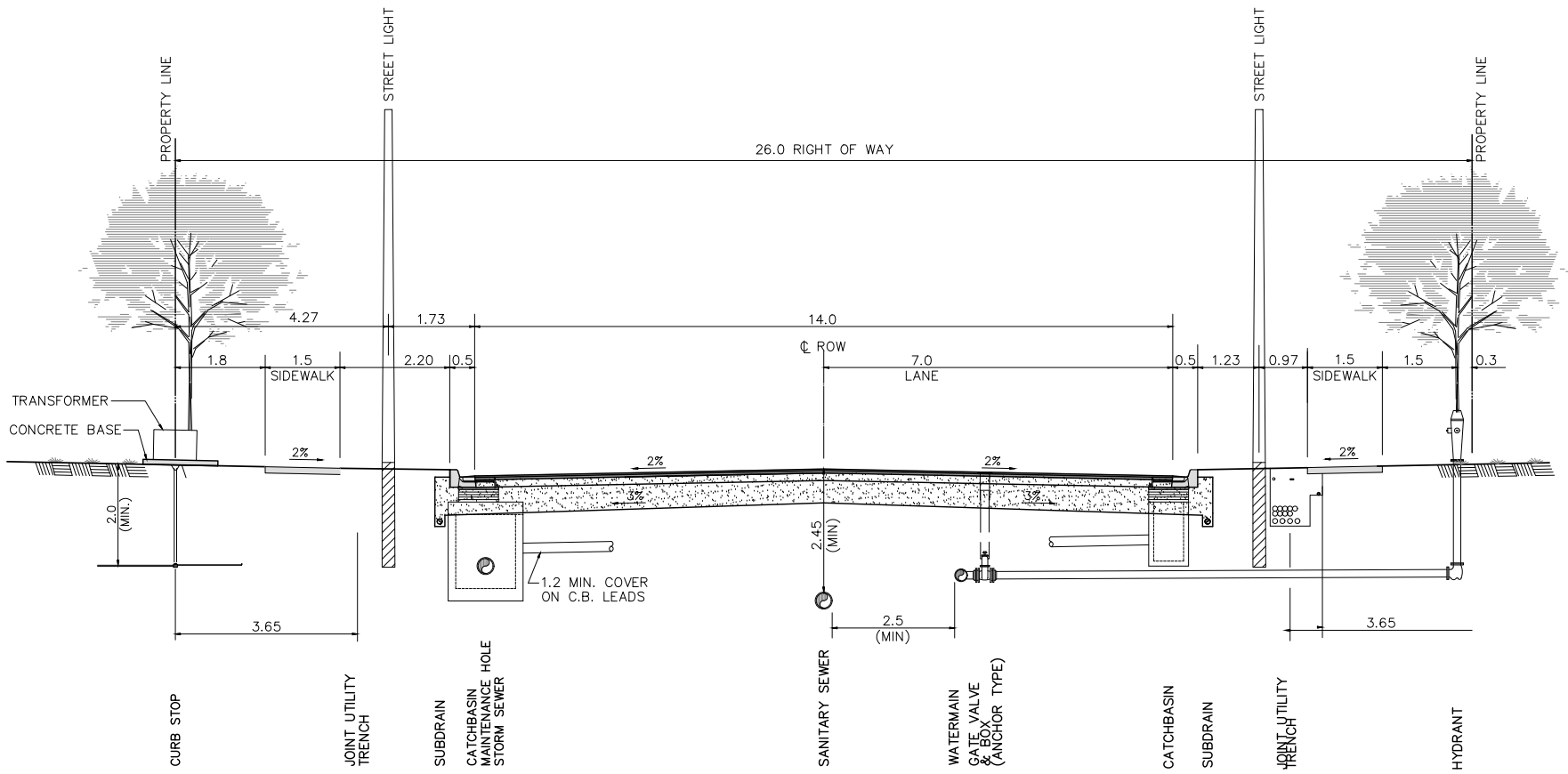
TOWNSHIP OF SOUTHGATE	DATE MAY, 2021	REV. 2
STANDARD CROSS-SECTION LOCAL STREET – 20.0m R.O.W.	STD. R1	



NOTES:

1. LOCATE HYDRO TRANSFORMER AS PER STANDARD U1 OR U2
2. TREE PLANTING 0.3m FROM PROPERTY LINE
3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

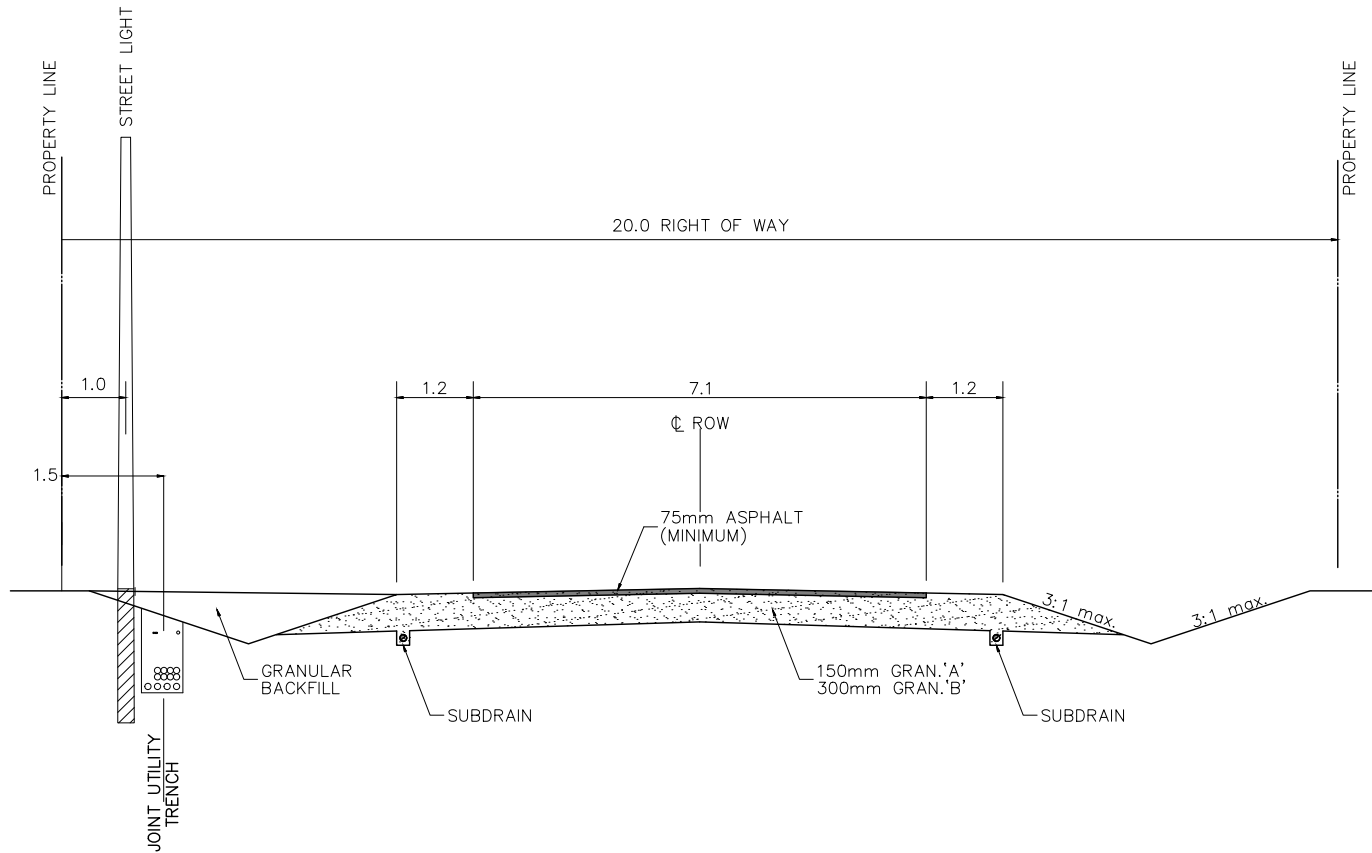
TOWNSHIP OF SOUTHGATE	DATE MAY, 2021	REV. 2
STANDARD CROSS-SECTION COLLECTOR STREET 22.0m R.O.W.		STD. R2



NOTES:

1. LOCATE HYDRO TRANSFORMER AS PER STANDARD U1 OR U2
2. TREE PLANTING 0.3m FROM PROPERTY LINE
3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

TOWNSHIP OF SOUTHGATE	DATE MAY, 2021	REV. 2
STANDARD CROSS-SECTION ARTERIAL/COLLECTOR STREET 26.0m R.O.W.		STD. R3

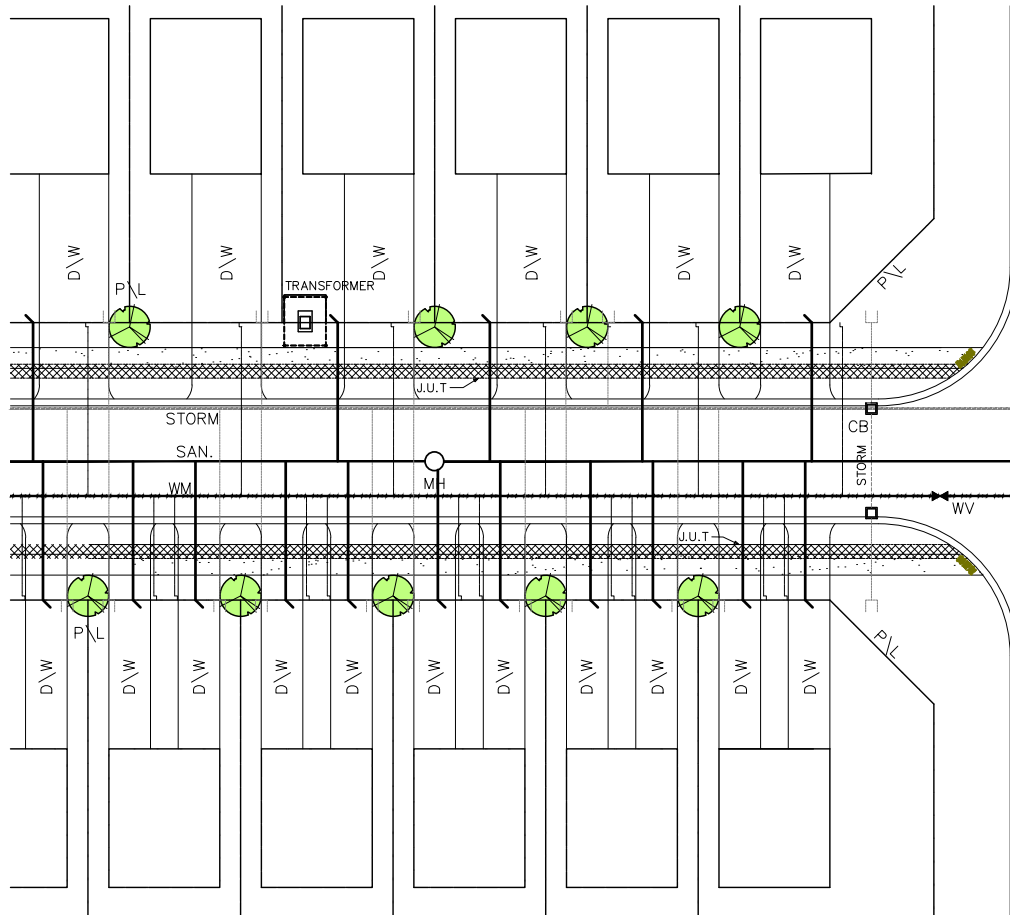


NOTES:

- 1 ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.





TOWNSHIP OF SOUTHGATE	DATE MAY, 2021	REV. 2
STANDARD CROSS-SECTION RURAL SECTION	STD. R4	

SINGLES



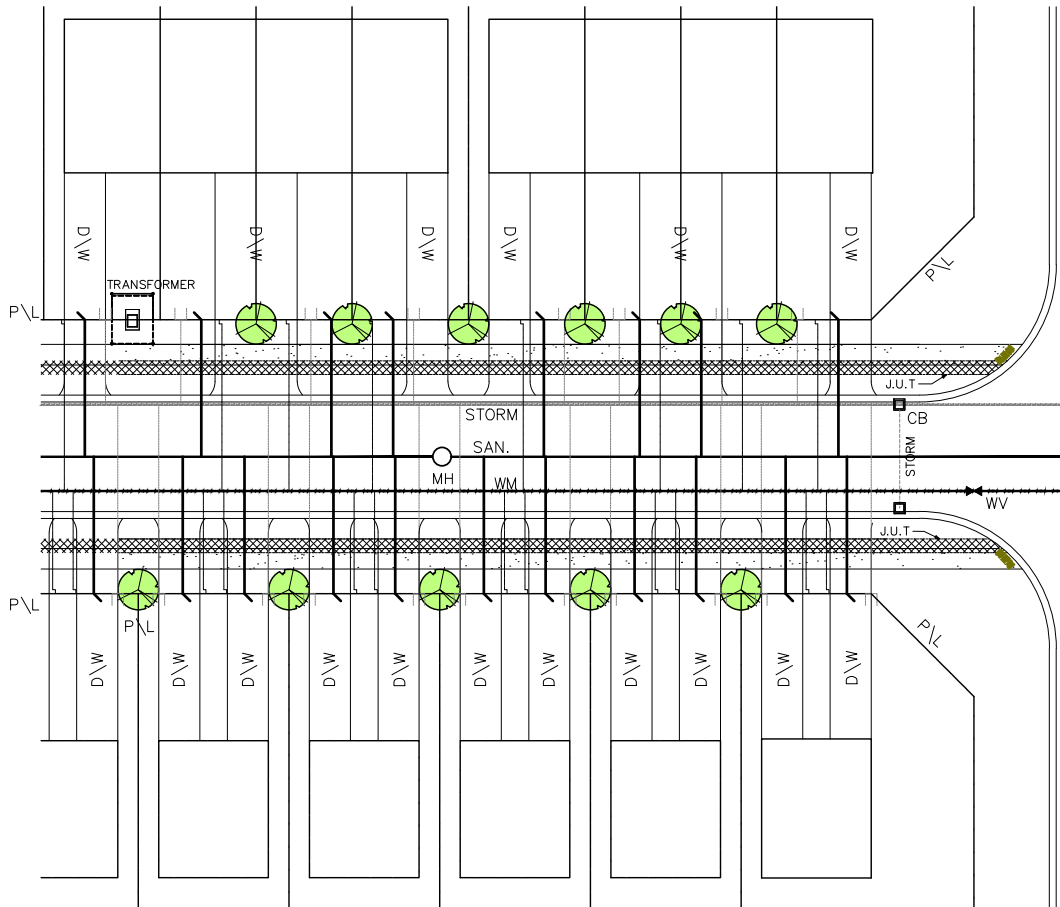
SEMI-DETACHED

NOTES:

1. STORM SEWER SERVICES 1.5m min. FROM SIDE LOT LINE.
2. WATERMAIN VALVES, HYDRANTS & CATCHBASINS NOT TO BE LOCATED IN WALKWAYS OR DRIVEWAYS.
3. ALL SERVICES TO RUN IN A STRAIGHT LINE, PERPENDICULAR TO ϕ OF ROAD FROM MAIN TO PROPERTY LINE.
4.  INDICATES POSSIBLE TREE LOCATION.
5.  INDICATES SANITARY SERVICE.
6.  INDICATES STORM SERVICE.
7.  INDICATES WATER SERVICE..





TOWNSHIP OF SOUTHGATE	DATE MAY, 2021	REV. 1
TYPICAL SERVICING LAYOUT SINGLES & SEMI DETACHED	STD. S1	

MULTI UNITS

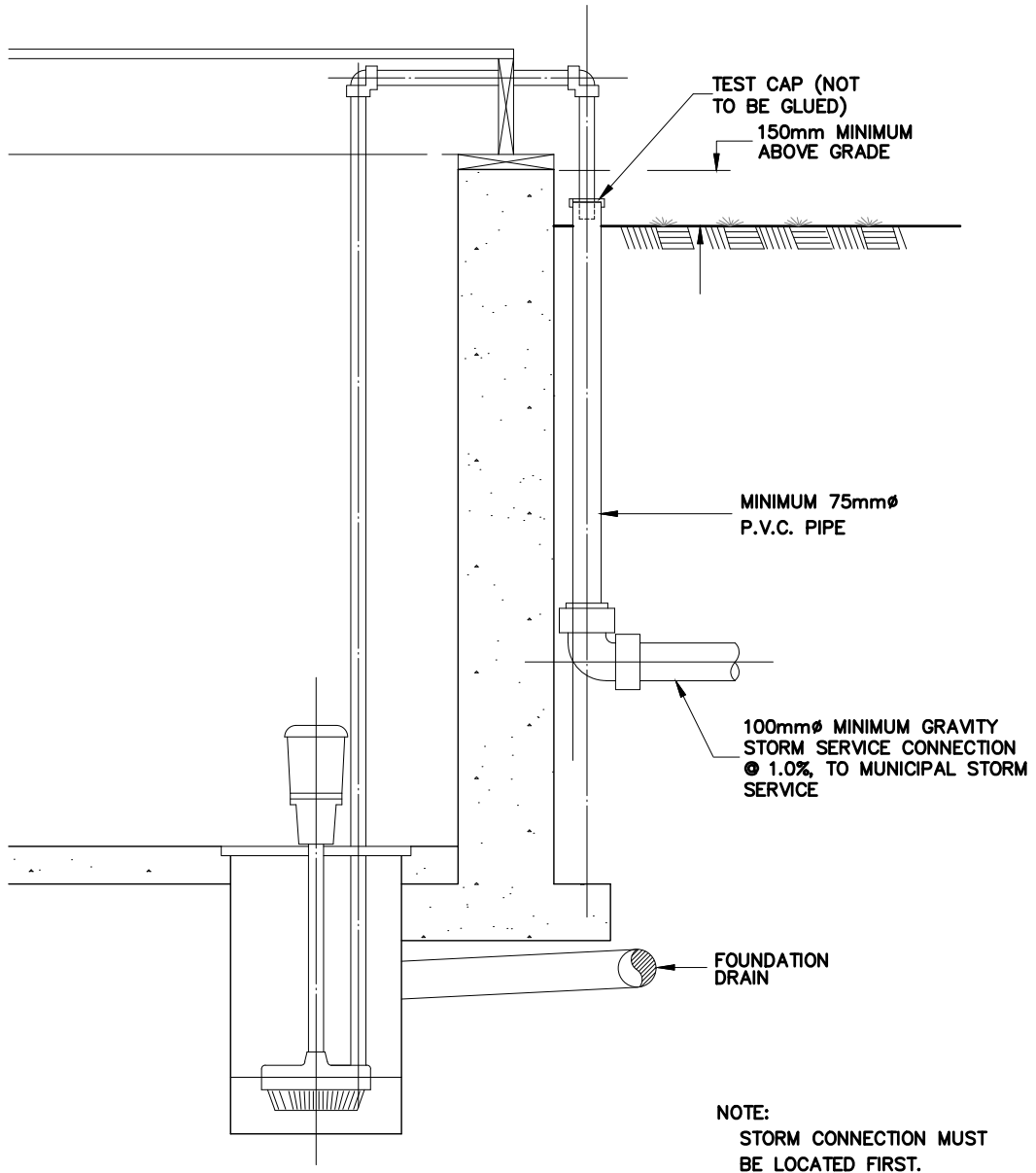


SEMI-DETACHED

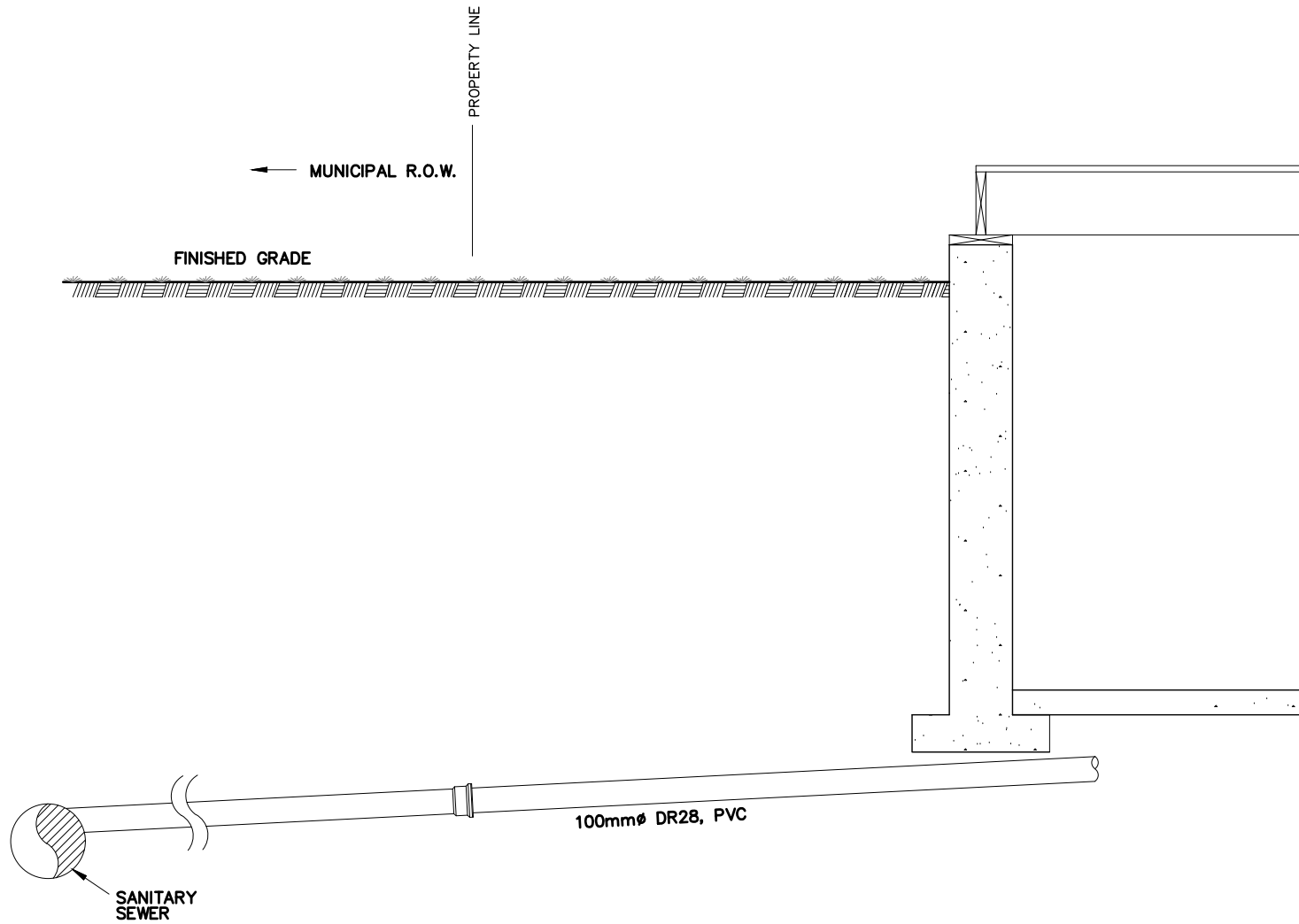
NOTES:

1. STORM SEWER SERVICES 1.5m min. FROM SIDE LOT LINE.
2. WATERMAIN VALVES, HYDRANTS & CATCHBASINS NOT TO BE LOCATED IN WALKWAYS OR DRIVEWAYS.
3. ALL SERVICES TO RUN IN A STRAIGHT LINE, PERPENDICULAR TO ϕ OF ROAD FROM MAIN TO PROPERTY LINE.
4.  INDICATES POSSIBLE TREE LOCATION.
5.  INDICATES SANITARY SERVICE.
6.  INDICATES STORM SERVICE.
7.  INDICATES WATER SERVICE..

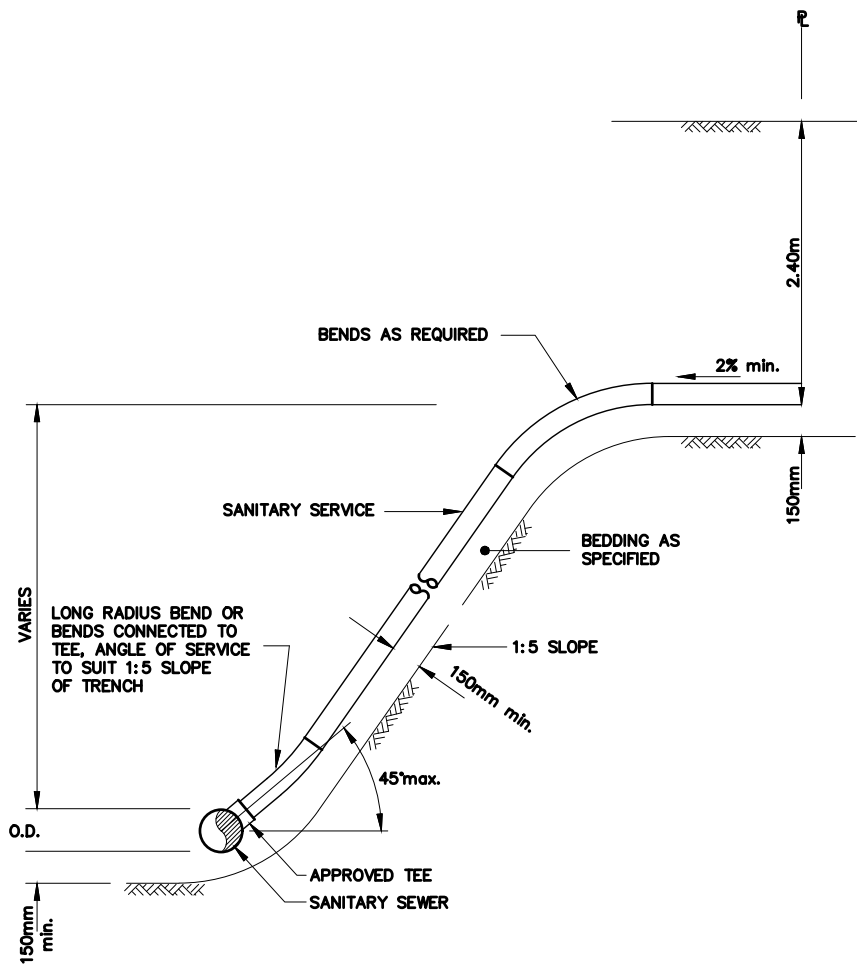
TOWNSHIP OF SOUTHGATE	DATE MAY, 2021	REV. 0
TYPICAL SERVICING LAYOUT SEMI DETACHED & MULTI UNITS		STD. S2



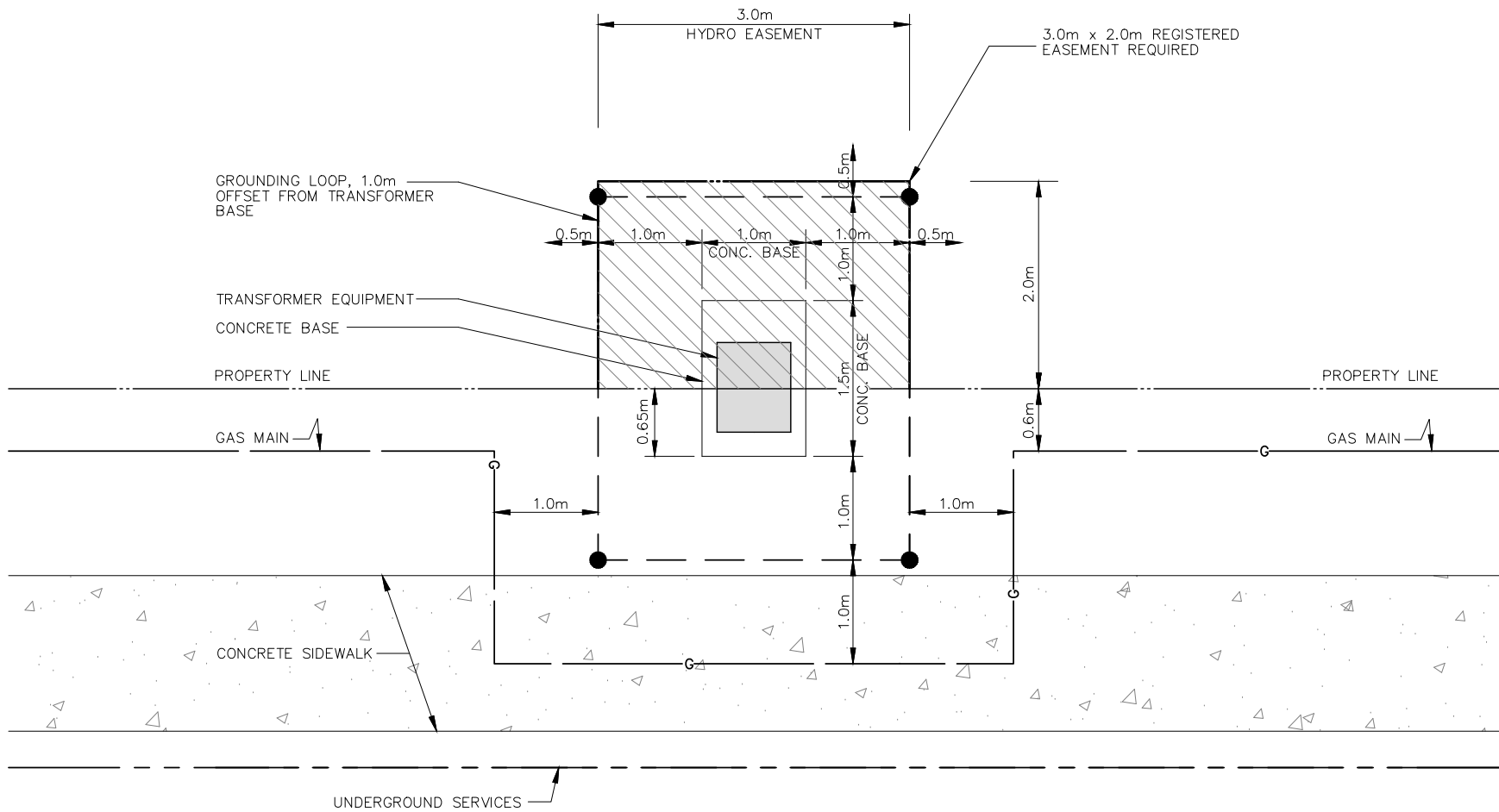
TOWNSHIP OF SOUTHGATE	DATE OCTOBER, 2021	REV. 1
SUMP PUMP TO STORM SEWER CONNECTION	STD. S3	



TOWNSHIP OF SOUTHGATE	DATE OCTOBER, 2021	REV. 2
SANITARY SERVICE CONNECTION TYPICAL DEPTH	STD. S4	



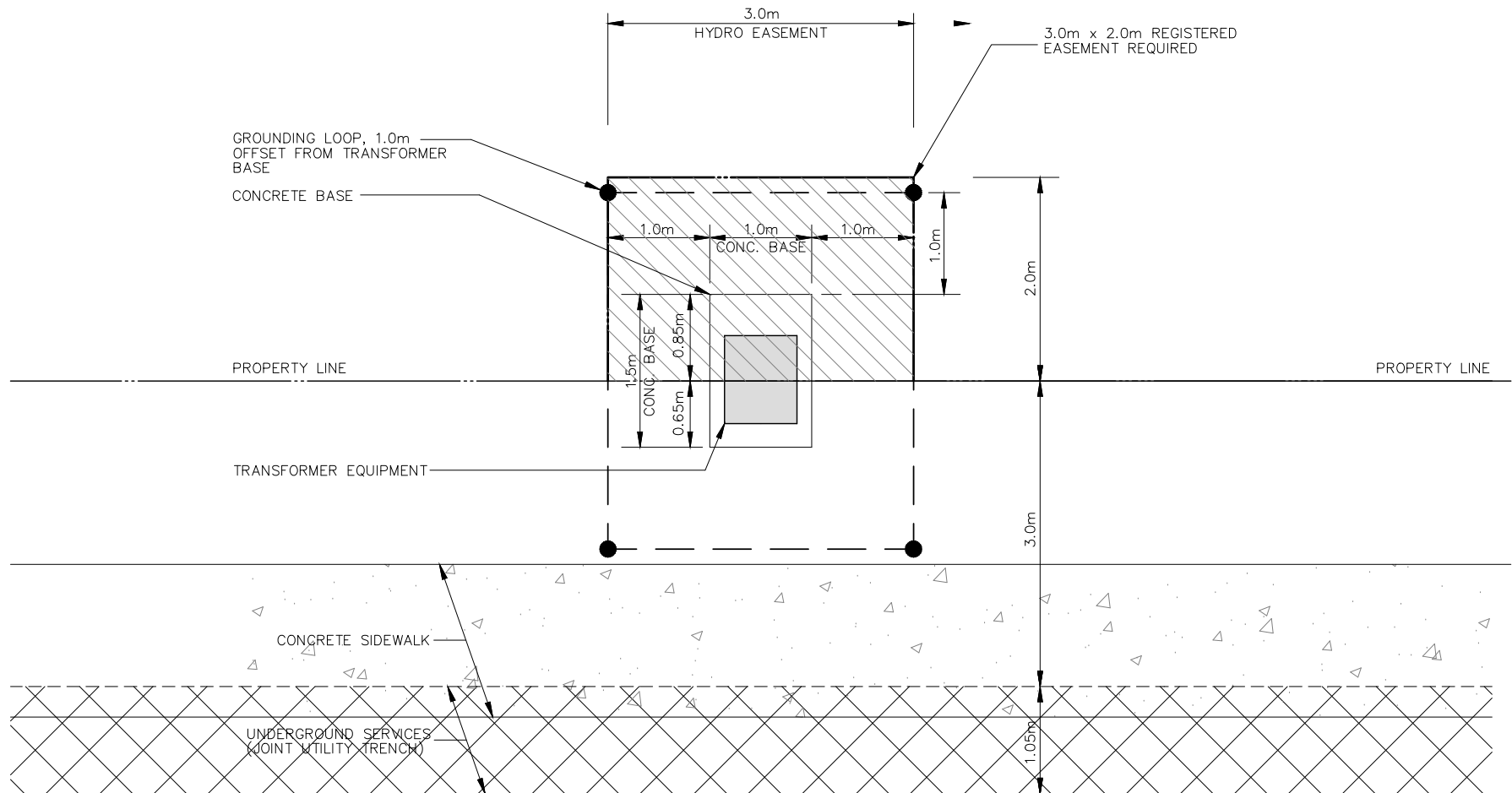
TOWNSHIP OF SOUTHGATE	DATE OCTOBER, 2021	REV. 2
SANITARY SERVICE CONNECTION FOR SEWER MAINS \geq 4.0m DEEP		STD. S5



NOTES:

1. TRANSFORMER INCLUDING GROUNDING LOOP TO BE ALIGNED ON THE LOT FRONTAGE BASED ON THE FOLLOWING CRITERIA:
 - PLACE ENTIRELY, INCLUDING GROUNDING LOOP, ON ONE LOT IF POSSIBLE TO AVOID CONFLICT WITH SIDE YARD DRAINAGE SWALE AND TO REDUCE EASEMENT REQUIREMENTS.
 - MINIMUM 1.0m CLEARANCE BETWEEN GROUNDING LOOP & MUNICIPAL SERVICES.
 - MINIMUM 1.0m CLEARANCE BETWEEN TRANSFORMER BASE & DRIVEWAYS.
2. EASEMENT SHOWN IS BASED ON 1.5m x 1.0m TRANSFORMER BASE ORIENTED AS SHOWN. BASES LARGER THAN THIS WILL REQUIRE EASEMENT TO BE ADJUSTED ACCORDINGLY.
3. STANDARD SHOWN INCLUDES SIDEWALK, STANDARD WITHOUT SIDEWALK IS THE SAME.

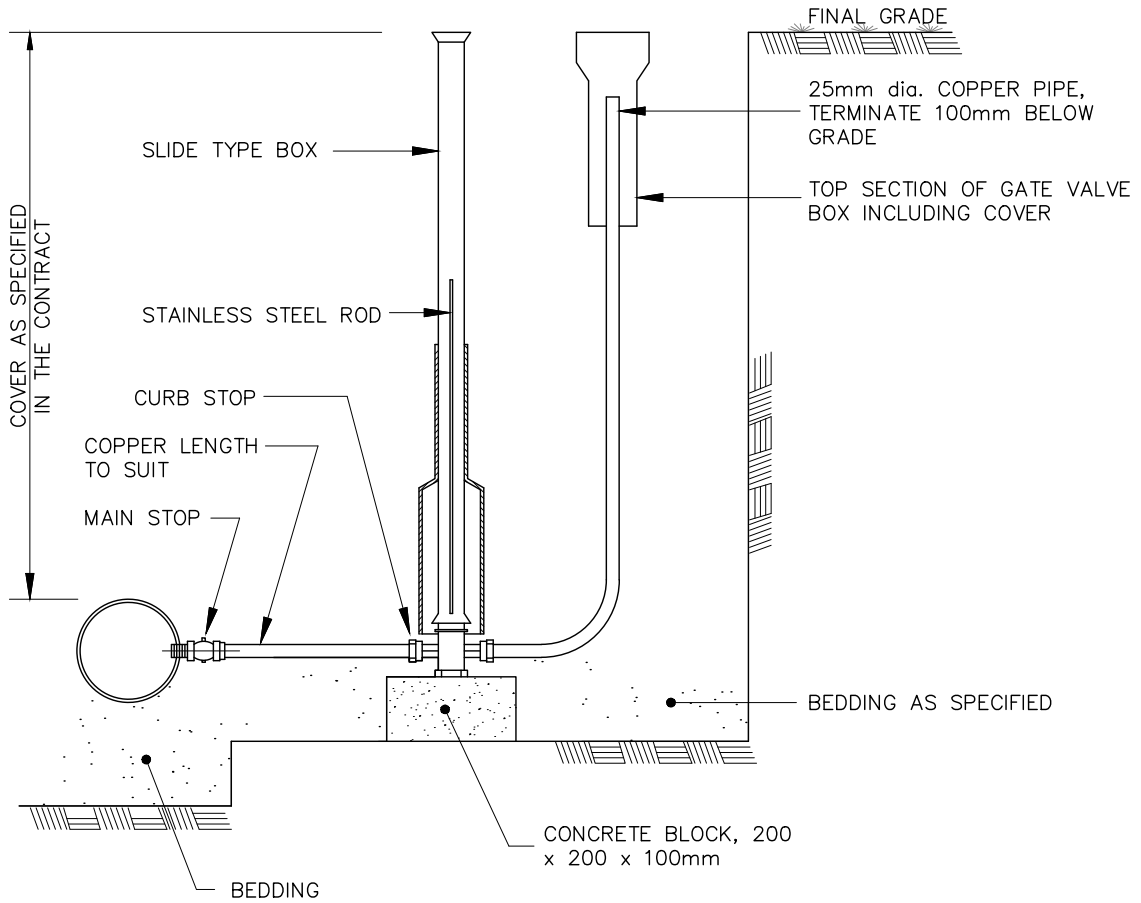
TOWNSHIP OF SOUTHGATE	DATE AUGUST, 2021	REV. 1
TRANSFORMER LOCATION & EASEMENT SIZE WITH GAS 0.3m OFF PROPERTY		STD. U1



NOTES:

1. TRANSFORMER INCLUDING GROUNDING LOOP TO BE ALIGNED ON THE LOT FRONTAGE BASED ON THE FOLLOWING CRITERIA:
 - MIN 0.3m CLEARANCE BETWEEN PAD BASE & MUNICIPAL SERVICES PER HYDRO CLEARANCES.
 - MINIMUM 1.0m CLEARANCE BETWEEN TRANSFORMER BASE & DRIVEWAYS.
2. EASEMENT SHOWN IS BASED ON 1.5m x 1.0m TRANSFORMER BASE ORIENTED AS SHOWN. BASES LARGER THAN THIS WILL REQUIRE EASEMENT TO BE ADJUSTED ACCORDINGLY.
3. STANDARD SHOWN INCLUDES SIDEWALK, STANDARD WITHOUT SIDEWALK WILL BE SUBJECT TO THE SAME REQUIREMENTS.

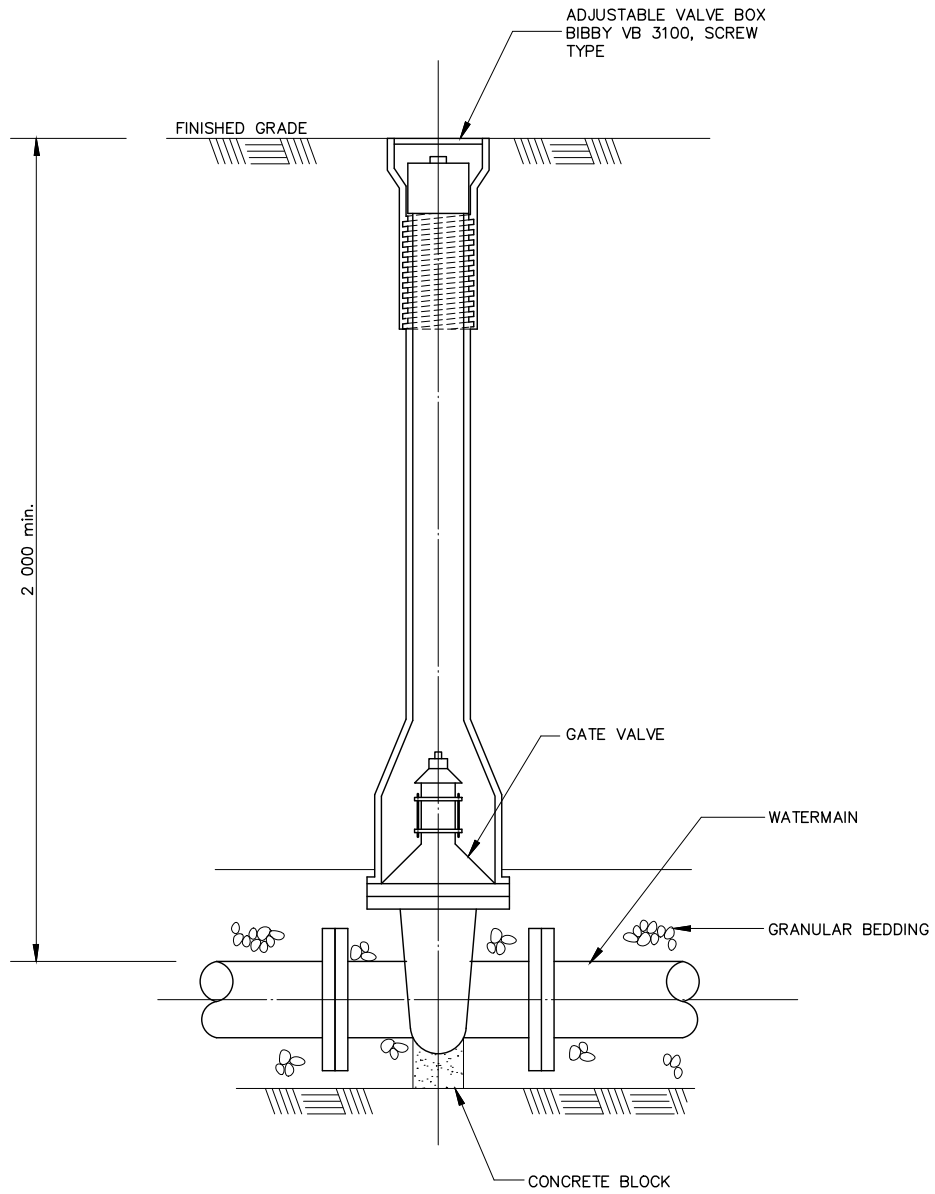
TOWNSHIP OF SOUTHGATE	DATE MAY 2021	REV. 0
TRANSFORMER LOCATION & EASEMENT SIZE WITH JOINT UTILITY TRENCH	STD. U2	



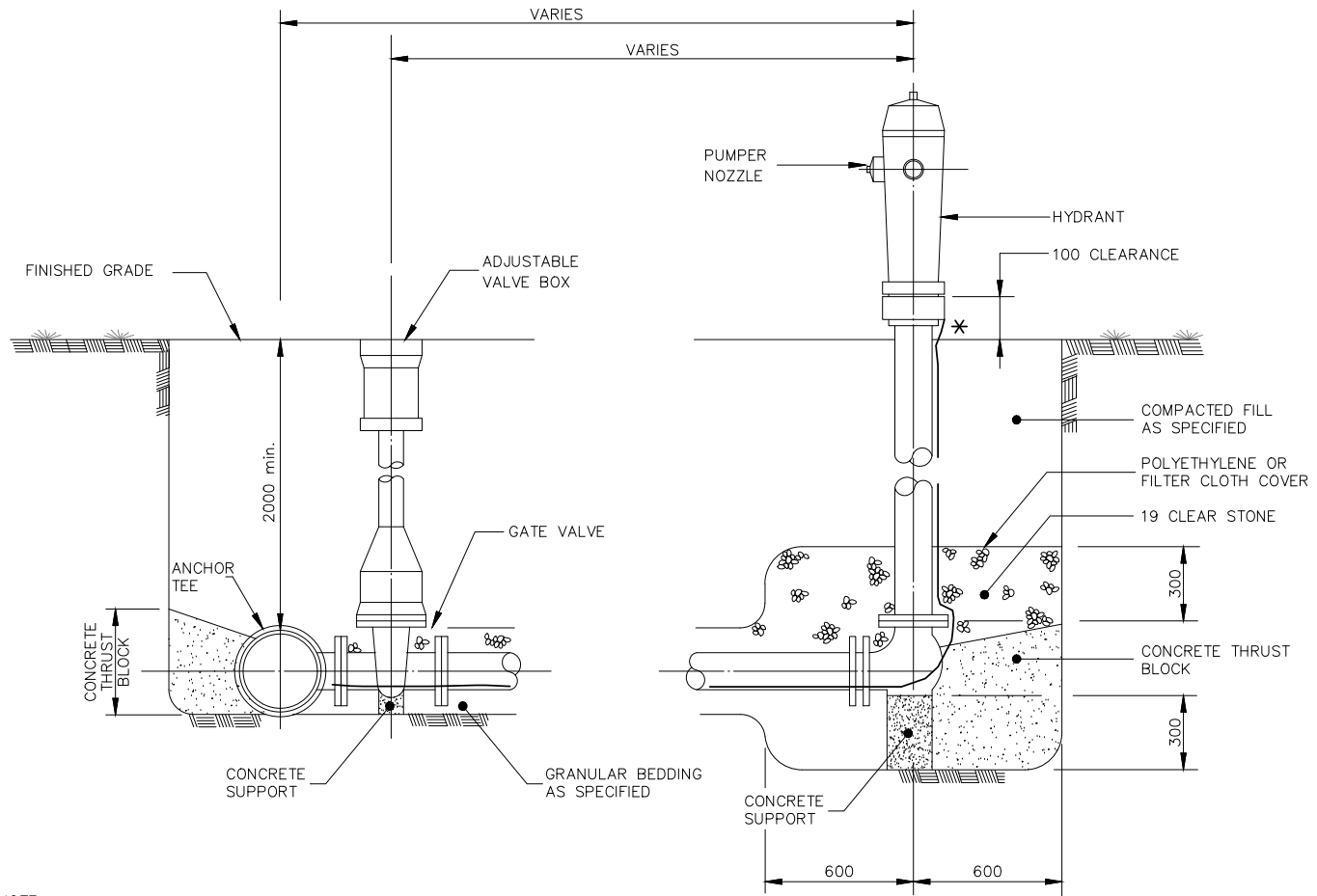
NOTES:

1. SADDLES SHALL BE USED FOR PLASTIC PIPE.
2. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SHOWN.

TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
25mm BLOW OFF INSTALLATION	STD. W1	



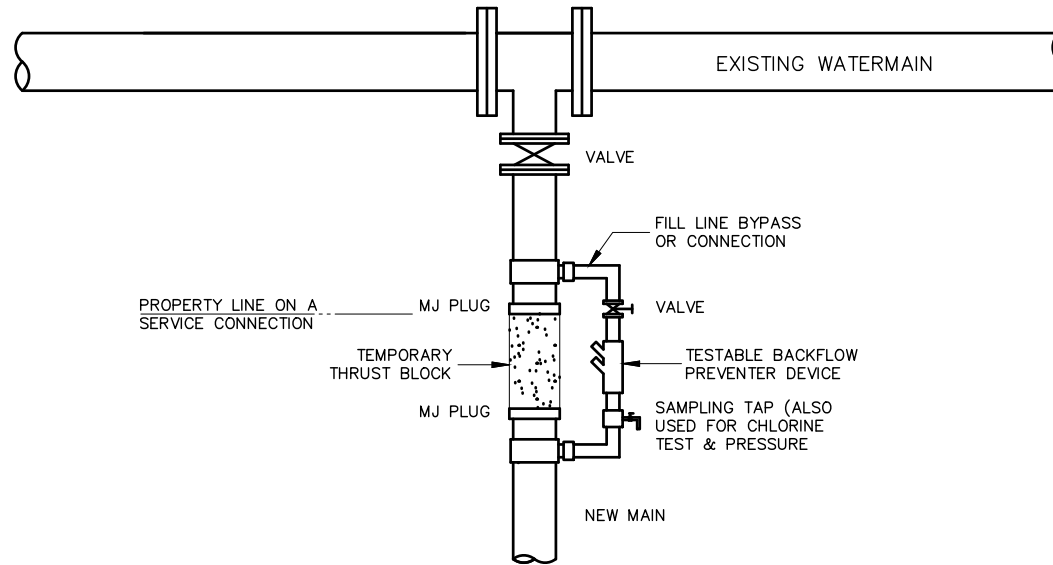
TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
VALVE AND VALVE BOX	STD. W2	



NOTE:
 HYDRANT TO BE SET PLUMB
 WITH EXTENSIONS TO SUIT DEPTH
 OF LEAD. LEAD TO BE SET LEVEL.

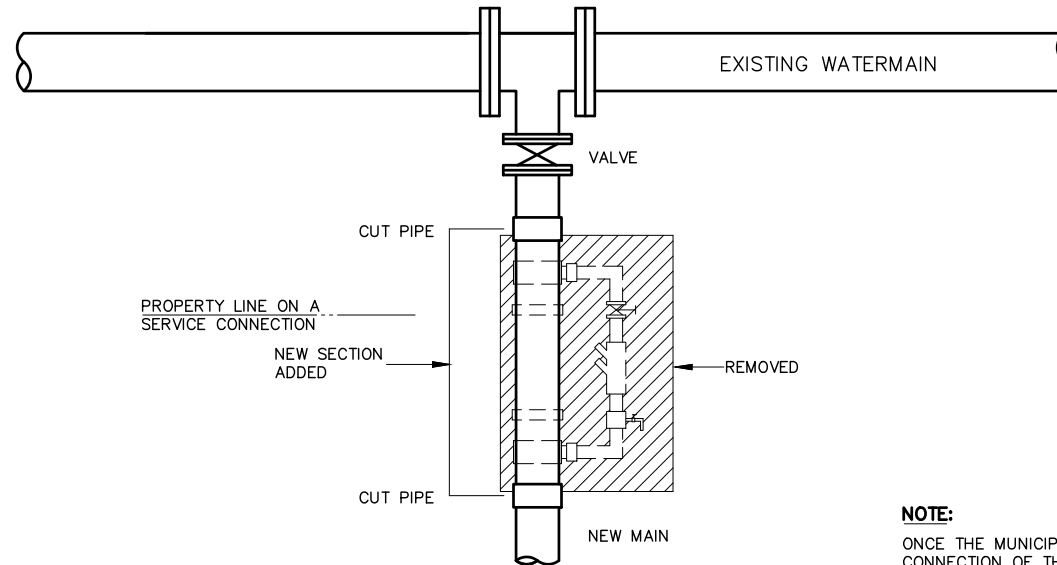
* CONNECT TRACER WIRE
 TO UNDERSIDE OF LOWER
 FLANGE OF FIRE HYDRANT

TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
HYDRANT SET	STD. W3	



TYPICAL TEMPORARY CONNECTION
ON WATERMAINS OR SERVICES
100mm OR LARGER

TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
CONNECTION OF NEW WATERMAIN TO EXISTING WATERMAIN	STD. W4	

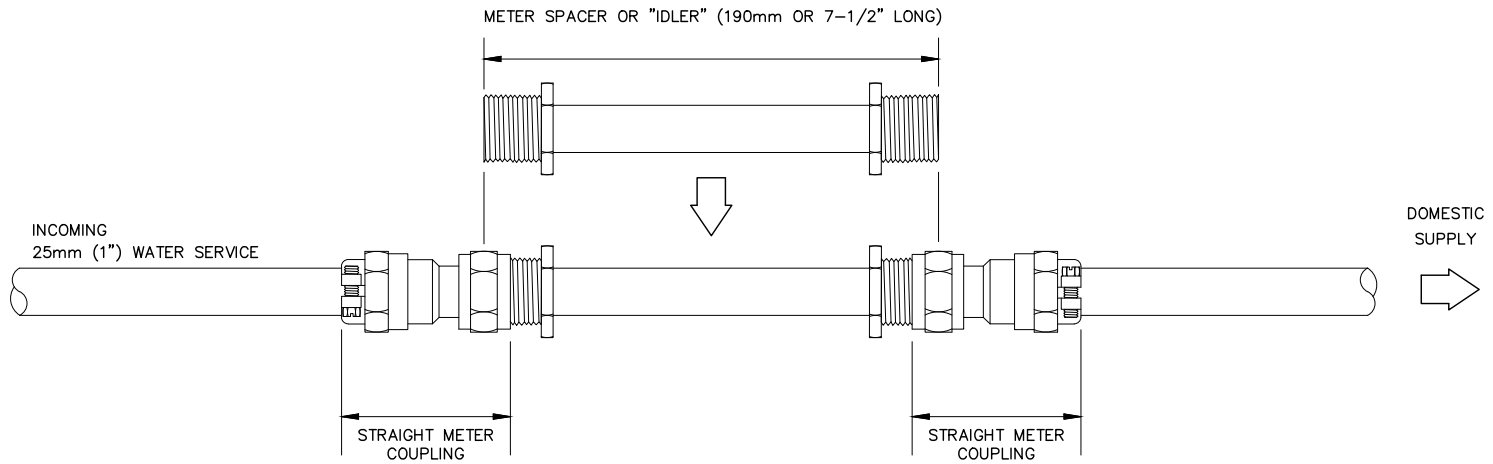


TYPICAL TEMPORARY CONNECTION
ON WATERMAINS OR SERVICES
100mm OR LARGER

NOTE:

ONCE THE MUNICIPALITY AUTHORIZES FOR THE CONNECTION OF THE NEW MAIN TO THE EXISTING WATERWORKS SYSTEM, THE PERFORATED SECTIONS OF THE MAIN FOR THE JUMPER LINE MAY BE CUT OFF AT THE INDICATED LOCATIONS, THE JUMPER LINE REMOVED AND A NEW SECTION OF MAIN ADDED.

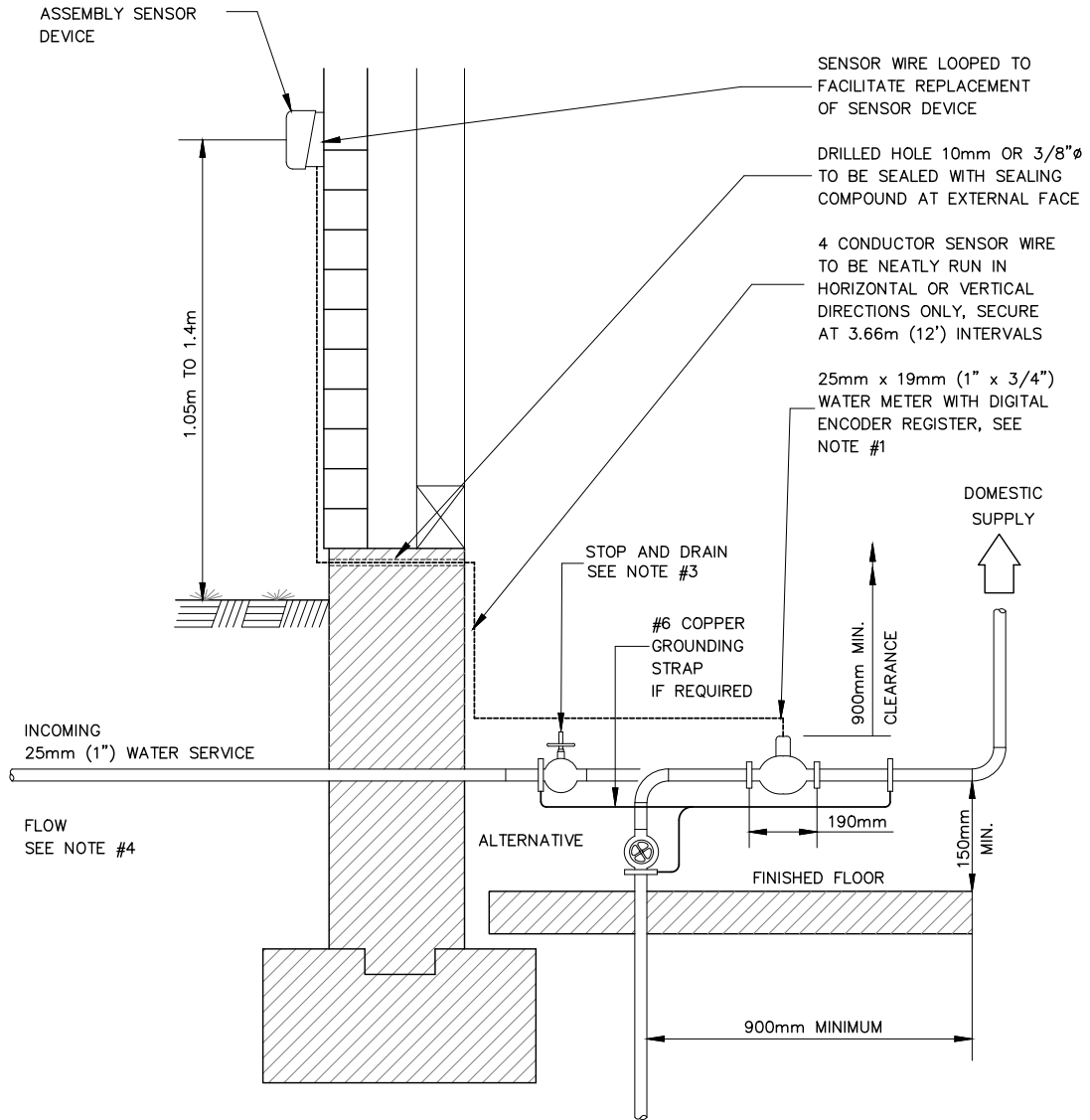
TOWNSHIP OF SOUTHGATE	DATE APRIL, 2001	REV. 0
CONNECTION OF NEW WATERMAIN TO EXISTING WATERMAIN	STD. W5	



NOTES:

1. - METER SPACER 190mm LONG WITH THREADED ENDS, DESIGNED TO REPLACE 1"x3/4" WATER METER, SHALL BE INSTALLED ON DOMESTIC WATER SERVICES AFTER THE STOP AND DRAIN TO ACCOMMODATE FUTURE WATER METER.
2. - METER SPACER SHALL BE INSTALLED HORIZONTALLY (PARALLEL TO FLOOR).
3. - METER SPACER SHALL BE INSTALLED AT LEAST 75mm FROM EXISTING WALLS AND AT LEAST 150mm FROM THE FLOOR.
4. - NO FAUCETS OR TEES SHALL BE INSTALLED BEFORE THE METER SPACER.
5. - STRAIGHT METER COUPLINGS WITH PACK JOINTS AND THREADED METER CONNECTIONS SHALL BE USED TO INSTALL THE METER SPACER.

TOWNSHIP OF SOUTHGATE	DATE MAY 2021	REV. 1
SPACER FOR WATER METER	STD. W6	



NOTES:

1. - METER SHALL BE 19mm (3/4") METER. REGISTRATION IN CUBIC METRES. 25mm (1") THREADED CONNECTIONS.
2. - SUPPLY AND INSTALL REMOTE READOUT DEVICE ON OUTSIDE WALL WITHIN 2.0m OF THE FRONT WALL AND ON THE SAME SIDE AS THE HYDRO METER. REMOTE READOUT DEVICE SHALL BE SUITABLE FOR TOUCH READ AUTOMATED READING AND BILLING SYSTEM.
3. - STOP AND DRAIN VALVE TO BE THE SAME SIZE AS INCOMING PIPE.
4. - IF HOT WATER TANK IS WITHIN 3.0m OF THE METER, A CHECK VALVE IS REQUIRED BETWEEN THE METER AND THE HOT WATER TANK.
5. - METER SHALL BE INSTALLED USING THREADED CONNECTIONS ONLY.

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TOWNSHIP OF SOUTHGATE	DATE MAY 2021	REV. 1
TYPICAL WATER METER INSTALLATION		STD. W7