



**TOWN OF WASAGA BEACH
ENGINEERING STANDARDS**

April 2021

TOWN OF WASAGA BEACH

ENGINEERING STANDARDS

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INTRODUCTION

The Town of Wasaga Beach Engineering Standards are intended for use as a guide for subdivision, capital works and site plan design, to establish a uniform criteria of minimum standards and to improve the processing of engineering design submissions for development and capital related works. Changes to these standards, which improve or maintain the quality of the design will be considered for acceptance subject to the approval of the Town's Engineer, which may be based on discussions with the Director of Public Works and/or the Director of Planning and Economic Initiatives.

It is understood that these standards may be referred to as a schedule in a subdivision agreement and that the current revision of the standards are then considered to be part of the agreement.

All proposed construction products and materials shall be CSA certified and in accordance with the Town approved materials list as amended from time to time.

Throughout this document, the term "Town Engineer" shall mean the Manager of Engineering Services and/or his/her designate.

TOWN OF WASAGA BEACH ENGINEERING STANDARDS

1. DESIGN SUBMISSION REQUIREMENTS

1.1 General

Ontario Provincial Standard Specifications and Drawings shall apply together with the following information.

Subdivision and capital servicing designs prepared by the Developer's and/or the Town's Consulting Engineer are reviewed by the Town's Engineers and by staff of the Public Works Department as applicable. The review procedure is set out below. Incomplete submissions that do not address all aspects of the draft conditions or Engineering Standards will be returned with a request to complete the documentation.

Submissions must be complete and a full set of design drawings and reports required for the design in order to be accepted. Incomplete submissions will be returned to the applicant without comment.

The Planning Department will circulate one (1) hard copy and a complete digital set of each full development application submission to the Town Engineer for review. The Town Engineer will review the design drawings with the Fire Department and Public Works (Operations and Parks) as applicable.

The Planning Department shall also be responsible for circulating all design submissions directly to the Nottawasaga Valley Conservation Authority (NVCA) as well as any / all other agencies from which the application requires approval.

1.2 First Submission / Draft Plan Application Submission (Stage 1 of Development Engineering Review)

For Planning Applications including Official Plan Amendment, Zoning By-Law Amendment and related applications, up to and including Draft Plan Approval, a copy of the General Site Servicing Plan shall be submitted for approval in principal before submission of detailed drawings. The plan shall indicate the proposed locations of street lighting, roads, sidewalks, and walkways, as well as watermains and storm and sanitary sewers and associated appurtenances. All locations must be established and resolved by the Developer's Engineer in conjunction with the utility companies and in accordance with the locations on the typical cross-sections.

Bell cables and terminals, hydro wires and transformers and coaxial television / communication cables and natural gas services shall be dealt with by those respective utilities under separate agreements.

The following documents shall be submitted to the Town Planning Department for circulation:

- A minimum of two (2) sets of the "Draft" Plan of Subdivision, General Site Servicing Plan, Functional Servicing Report, Preliminary Stormwater Management Report and calculations requiring acceptance.
- A minimum of two (2) sets of all documents attachments as detailed below in Section 1.4.
- A covering letter to itemize and address any previous discussion or submission comments

In addition to the above, as outlined in the Town's Engineering Review Fee Policy, the first deposit of the total engineering review fee (i.e. 25% of the total fee) is required with the first submission for any development application. In order to establish and estimated total review fee, the applicant shall provide a benchmark estimated cost of construction prior to the first submission, such that Engineering staff can estimate the fee amount. The 25% deposit for the fee may then be provided along with the first submission. This process is to be explained to the applicant at the Pre-consultation stage. Should the 25% deposit not be provided with the first submission (e.g. the benchmark estimated cost of construction was not received ahead of the first submission), then the engineering comments generated through review of the first submission will not be circulated to the applicant until the fee has been received.

1.3 Second and Subsequent Submissions / Detailed Design (Stage 2 of Development Engineering Review)

It is recommended that the applicant attend a pre-submission meeting with Engineering staff prior to any subsequent submissions to ensure understanding of previous comments.

All detailed design submissions shall include the following:

- A minimum of two (2) hard copies and one digital copy of complete sets of detailed design drawings and calculations, submitted to the Town Planning Department for circulation. One copy of the full-sized design drawing sets is to be bound and rolled for circulation by the Planning Department to the Town's Engineer. The second hard copy set of drawings are to be individually folded for Planning Department filing. Following completion of Town review, one digital copy of marked up drawings will be returned to the Developer's Consulting Engineer, if revisions are necessary, with comments marked in red.
- A covering letter from the developer's representative shall be submitted itemizing and identifying how each of the municipal comments from the previous submission has been addressed.
- The above procedure shall be repeated as necessary until approval of the engineering drawings and calculations has been received. It is anticipated

that acceptance of the design drawings should be achieved by the third submission. Additional submissions will require further Engineering Review Fees and application approval within two (2) submissions will recognize a reduction in Fees in accordance with the Engineering Review Fee Policy.

- A digital copy of all drawings in vector-based Adobe Acrobat (.pdf) and AutoCAD (.dwg) format acceptable to the Town shall be provided on CD with the final design submission.
- A submission to the Ministry of the Environment, Conservation and Parks will not be endorsed by the Town until the Drawings have been reviewed and deemed acceptable by the Town Engineer and the Director of Public Works.

1.4 Reports and Drawings / Plans

Detailed design submissions are to be accompanied by a minimum of two (2) copies of any supporting documentation required for the completeness of the design. Such documentation is to include (as applicable), but shall not be limited to, copies of the following reports unless waived by the Town Engineer:

- Aggregate Potential Assessment and/or Aggregate License Compatibility Assessment
- Aggregate Studies related to/and in compliance with the requirements of the MNR license for new/expansion to existing pits and quarries
- Archaeological Reports
- Composite Utility Plan(s)
- Contamination Management Plan
- D4 Assessment
- Energy Analysis
- Environmental Impact Study
- Functional Servicing Report
- Geotechnical/Soil Stability Report
- Golf Course Errant Ball Spray Analysis
- Hydrogeological Study / Hydrology Study or Water Budget
- Infrastructure Design Report
- Lighting Illumination Study/Plan
- Lot Grading Plan
- Master Fire Plan
- Master Servicing Study / Servicing Options Report
- Natural Hazards Study / Coastal Engineering Study
- Plans/Profiles of Internal Roadways (if necessary)
- Parks Plans
- Noise/Vibration Impact Analysis
- Odour/Dust/Nuisance Impact Analysis
- Operations and Maintenance Manual
- Parking Report/Analysis
- Shadow Analysis

- Site Servicing Plan
- Source Water Protection Land Use Questionnaire
- Stormwater Management Report
- Town Drinking Water Permit Approvals
- Traffic Impact Study
- Water Conservation Report
- Watershed/Sub-watershed Study
- Well Interference Study
- Wellhead Protection Area – Risk Assessment Report or Risk Management Plan
- Wind Study
- Wind Turbine Impact Study

The relevant studies that are applicable to each application shall be confirmed through the Pre-consultation process, which is managed through the Town Planning Department.

The following provides brief details of the requirements for typical application reports:

- **Functional Servicing Report (FSR)** must at minimum address the proposed servicing of the development. Specifically, detail with regard to water, sanitary sewer and stormwater management (SWM) will need to be addressed with regard to the overall site and how existing municipal servicing and utilities will be utilized. Confirmation will be required that the existing municipal services are sufficiently sized to accommodate the proposed development. Calculations to support the design of the supply and distribution works including main sizes, fire flows and anticipated flows from domestic and other users. This will be compared and verified in the Town's water distribution system model. Any proposed phasing of the development should be addressed in this report, outlining timing of works and any triggers for works. Depending on the complexity of the proposed development, a Functional Servicing Brief (FSB) may be acceptable as the minimum amount of technical reporting required for any development application, at the discretion of the Town Engineer. The FSB shall generally describe the same details as an FSR, but would not require full modelling analysis. Additionally, the FSB may combine / include the general details outlined for the following reports.
- **Geotechnical / Soils Report** by a qualified Geotechnical Consultant identifying site soil conditions, seasonal high groundwater table and stipulating that cathodic protection is required for watermains and appurtenances. Recommendations must be provided for pipe bedding and backfill materials, foundations, retaining walls, slope stabilization including stormwater management ponds and road sub-base as well as design criteria of the road base and surface materials if conditions dictate requirements for greater than the minimum specified in Section 2.0 Roadways.

- **Stormwater Management (SWM) Report** addressing methods of stormwater runoff quality, quantity, siltation and erosion control. The potential use of Low Impact Development (LID) methods are also to be reviewed and recommended as applicable in the SWM Report. Reference shall be made to the MECP Low Impact Development Stormwater Management Guidance Manual (still in DRAFT at the time of this Standard being approved), as well as the Conservation Authority documents referenced in this Manual.
- **Traffic Impact Study** will be required where new development or expansion of existing development will generate more than 50 trips during the peak hour; i.e., 50 dwelling units or an office complex of approximately 1,850 square metres. The report shall assess the impact of the development on the transportation system and identify improvements that may be required as a result of the development for a minimum 10-year horizon, depending on anticipated duration of full build-out. Horizons should reflect full build-out of the development and 5 and 10 years beyond. Interim horizons should also be considered to coincide with phases of development should road system improvements be warranted. For developments generating less than 50 trips per hour, a Traffic Impact Brief should be prepared to confirm the volume of traffic to be generated and review the site access operations, which may form part of the FSR.
- **Sanitary and Storm Sewer Calculations** on standard design sheets bound with engineering drawing set to be included. (To be included in the FSR, but must also form part of the design drawing set.)
- **Tree Inventory / Preservation, Compensation and Landscaping Report** prepared by a qualified professional. (Certified Arborist and/or Landscape Architect OALA as applicable.)
- **Acoustic/Noise Report** identifying existing and development noise sources and demonstrating how mitigating measures will be implemented to conform to MOE Guidelines and to the satisfaction of the Town Engineer.
- **Lighting Intensity Report / Plan** demonstrating no site plan impact at property line for private development and verifying adequate levels of illumination for all roads with dark sky compliant lighting. The Lighting Report / Plan will be a requirement in the detailed design stage of development and will not be a requirement for Draft Plan approval.

1.5 Engineering Design Drawings

Engineering drawings shall be in AutoCAD format and shall consist of the following:

- Cover Sheet
- General Notes (per Std. Drawing No. 1)

- Draft Plan of Subdivision
- General Site Servicing Plan (including external works where applicable)
- Sanitary Drainage Area Plan (including external drainage plan where applicable)
- Storm Drainage Area Plan (including Pre-Development and Post-development Drainage Area Plans showing external drainage where applicable)
- Sanitary and Storm Sewer Pipe sizing calculations sheets
- Lot Grading and Drainage Plan
- Siltation and Erosion Control Plan
- Tree Preservation, Compensation and Landscaping Plans
- Overall Comprehensive Plan of Easements
- Plan and Profile drawings of all streets, easements and external works
- Detail Sheets including standard and special details together with material and construction specifications
- Pavement Markings and Signage Plans
- Composite Utility Plan
- Lighting Design Plan
- Other Plans as required

All drawings must be in AutoCAD format acceptable to the Town and shall be stamped, signed and dated by a Professional Engineer. The digital submission of design drawings shall be in vector-based pdf file format.

The following standards shall be adhered to in preparation of these drawings.

- (a) All profiles must be shown to the geodetic datum that is noted on each drawing;
- (b) In general, East-West streets shall have zero chainage at their Westerly limits and North-South streets shall have zero chainage at their Southerly limits. Chainage on a plan-profile shall increase from left to right;
- (c) Drawings shall be metric size A1 (594 mm x 841 mm);
- (d) Scales for drawings shall be as follows:

General Layout Plan	1:1,000
Plan Profile Drawings/Horizontal (Reconstruction)	1:250 or 1:500
Vertical	1:50
- Scales shall be shown on all drawings;
- (e) The intersection of centrelines of streets shall be used as zero chainage;
- (f) When the plan must be broken because of curvature, etc., the profile shall be broken as well, so that as far as possible, chainage points in plan and profile will coincide vertically;
- (g) The drawings shall show clearly:

1. centreline chainage every 20 m max.;
 2. existing and proposed centreline elevations every 20 m max.;
 3. all vertical and horizontal curve data;
 4. gutter grades at all intersections, bends and cul-de-sacs (min grade 0.5%)
 5. all street names in larger font and bold;
 6. all lot lines and numbers per registered plan of subdivision;
 7. north arrows pointing towards the top or right of page;
 8. Geodetic Bench Mark locations (brass tablets)
 9. Town's name in lower right corner;
 10. up-to-date revisions block;
 11. ditch/swale and berm details, profiles and cross-sections;
 12. overall storm and sanitary drainage area and sub-area boundaries;
 13. lot grading, complete with underside of footing, basement floor, top of foundation wall, first floor elevations and lot corner elevations existing and proposed, recommended seasonal high ground water table
 14. sewer sizes, lengths, grades, inverts, structures, hydraulic grade lines, material type and classes on plan/profiles;
 15. where possible, avoid placing structures in driveways
 16. general note information should include the information provided in Std. Dwg. No. 1 as a minimum.
 17. all existing and proposed utilities;
 18. all limits of construction and phasing;
 19. all easements and appropriate labels;
 20. any special design information not covered by standard drawings.
 21. Key plan on each drawing;
- (h) The Developer's Engineer shall add their professional engineer's seal, signed and dated, to all submitted drawings;
- (i) All drawings shall include a blank / empty box location within the title block for the Town to stamp "Accepted for Construction", near the stamp of the signing engineer / architect. On the cover sheet / index, staff will affix the stamp at the bottom right hand corner such that the stamp may be visible when drawings are folded or rolled.
- (i) The Town Engineer shall be consulted as to the manner of showing information not set out in the above requirements.

The following minimum information shall be provided for Lot Grading design drawings:

1. Design elevations of the lot grades for all lot corners and grade change locations for the entire plan of subdivision.
2. Soak away pits / LID features (if applicable).
3. Invert and Top of Grate elevations of all and rear lot catch basins.
4. Grading arrows.
5. Invert elevations of all ditches at 20 metres intervals.

1.6 Acceptance of Originals

When all outstanding comments have been addressed, the electronic and two (2) bound hard copies of drawings shall be submitted to the Town Planning Department to circulate to the Town Engineer for the design to be “Accepted for Construction”. All drawings must be sealed and signed by the Developer's Engineer.

As an alternative of submitting final design drawings in hard copy format, at the discretion of the Town Engineer, the final drawings may be submitted in digital, vector-based Adobe Acrobat (pdf) format only for the Town to stamp, sign and date the drawings “Accepted for Construction” digitally. The digital drawings may be “batch stamped” for all drawings in the same location within the title block as described in Section 1.6.2 above. In this case, the digitally stamped drawings would be provided to the Developer's consultant upon execution of the development agreement (as applicable), which requires provision of securities, all fees paid by the Developer, insurance, etc. all in accordance with the agreement. Following circulation of the digitally stamped drawings, the Developer's consultant shall print and provide to the Town two bound hard copies of the stamped drawings for the Town's files (i.e. one for Planning Department and one for Engineering).

The final submission digital files shall be provided to the Town in vector-based Adobe Acrobat (.pdf) as well as AutoCAD (.dwg) format, on one (1)USB thumb drive. The drive is to include a labelling transmittal identifying the description, developer's name, file name and date delivered. A self-extracting Zip file (.exe file) may be used to perform file compression if required. It is the Developer's responsibility to ensure that all drawing changes occurring throughout the approvals process are incorporated into the digital submission.

1.7 Other Development Approvals

A copy of all other approvals that may be required for the development shall be submitted to the Town Planning Department. This may include, but not be limited to, the approvals received from the following authorities: Ministry of the Environment, Conservation and Parks, Ministry of Transportation, Ministry of Natural Resources and Forestry, the Nottawasaga Valley Conservation Authority, and the County of Simcoe.

1.8 Record Drawings

Individual Service Record Sheets

Prior to issuance of the Certificate of Substantial Completion (Basic Services) – a requirement for issuance of Building Permits, sewer and water service record sheets (SRS) for each lot must be forwarded to the Town Engineer digitally for review and comment. Each sheet must clearly identify the registered plan number, lot number, roll number and municipal street address together with the

services pipe material type, size, invert elevations and location swing tied to acceptable permanent structures and appurtenances such as property bars, maintenance holes, catch basins and gate valves. In addition to swing ties to the water service curbstop (CS) and distance from CS to sanitary sewer cleanout (CO), the SRS shall also provide the distance from the upstream and downstream sanitary MHs to the sanitary service tee. Please see Appendix I for a Water and Sewer Service Record Sheet template.

Upon final review and acceptance of all SRS by the Town Engineer, the Developer's consultant shall submit one hard copy and one digital copy of all SRS for that phase. The digital SRS shall be provided in vector-based Adobe .pdf format as individual files for each lot / property. The digital filename provided by the consultant shall be based on the fifteen (15) digit "lot roll number.pdf"; for example: 43640000000000.pdf. In the event that the individual lot roll numbers are not yet available on the County of Simcoe's website for interactive mapping, then each individual SRS digital file shall be named "block#-lot#.pdf" in accordance with lot reference on the registered M-plan / Site Plan / R-plan as applicable.

The final sheets that are accepted by the Town Engineer will be forwarded to the Town's Building Department as well as interdepartmental circulation for uploading to the Town's GIS mapping.

Construction Record Drawings

Prior to the issuance of the Certificate of Substantial Completion (Full Services) – a requirement for Occupancy Permits, "Record" drawings must be provided to and accepted by the Town Engineer.

Revisions must be made to the drawings to reflect any changes to the line and/or grade of the roadways and services, and incorporate all the grading modifications resulting from final lot grading. All valves, terminations, bends, reducers, tees and crosses shall be properly tied into fixed reference points.

If any revisions are required, one set of redlined drawings will be returned to the Developer's Engineer.

When all revisions and/or corrections have been made a complete hard copy set of "Record" drawings shall be submitted to the Town Engineer for review and approval. After a final review by the Public Works Department and the Town Engineer, one (1) complete hard copy set as well as one (1) digital copy CD shall be submitted to the Town Engineer. The USB thumb drive shall contain digital copies of the Record Drawings in vector-based Adobe Acrobat (.pdf) and current AutoCAD (.dwg) format complete with the pen style (.ctb) file.

The one (1) hard copy and one USB thumb drive shall be provided to the Public Works Department / Town Engineer for their record.

Final "Record" drawings shall be geo-spatially referenced with the Town's GIS

coordinates (i.e.: NAD83 / UTM Zone 17N).

Final "Record" drawings submitted in ACAD Format shall have consistent layer naming and irrelevant drafting layers removed. "Record" drawings shall not require any cross referenced external drawings.

The "Record" drawings shall be consistent with drafting requirements and include at a minimum the following information:

Road System

1. Final elevations of centre line of roadway every 20 metres.
2. Revised horizontal curve information.
3. Any additional information that has been required for construction after acceptance of the engineering drawings.
4. Revised construction benchmarks located in permanent locations throughout the development such as on fire hydrants and/or other permanent structures at sufficient intervals.
5. A minimum of one (1) Geodetic Bench Mark must be provided within each development, at the Town's discretion, and consist of a brass plaque embedded in concrete (or an alternative permanent marker approved by the Town). Bench Marks shall be in an area that is sufficient to support a tripod with a GPS receiver, has a clear view of the sky (e.g. minimal trees, buildings, topography, or other obstructions that might cause disruption to multipath of the GPS signal), has no above ground utility lines immediately overhead that might interfere with GPS signals, is on municipal property and is relatively secure and safe.. Geodetic Bench Marks shall be 1st and 3rd order for vertical and horizontal control respectively and shall be included on both the design and the Record drawings.

Storm System

1. Length, diameter, type of material, gradient and invert elevations shall be provided for all storm sewers.
2. Invert and top of frame and grate elevations of all storm Maintenance holes and catchbasins.
3. Revised gradients of all storm sewers along with as-constructed distances between Maintenance holes.
4. Any additional information that has been required for construction after acceptance of the engineering drawings.

Sanitary System

1. Length, diameter, type of material, gradient and invert elevations shall be provided for all sanitary sewers.
2. Invert and top of frame and cover elevations of all sanitary Maintenance holes.
3. Revised gradients of all sanitary sewers along with as-constructed distances between Maintenance holes.
4. Any additional information that has been required for construction after acceptance of the engineering drawing.

Water System

1. Elevations of top of watermain every 20 metres and at deflection points.
2. Diameter and type of material for all watermains.
3. Location by measurement of valves, bends, restrainers and terminations by swing ties to permanent structures.
4. Locations of cathodic protection / anodes.
5. Any additional information that has been required for construction after approval of the engineering drawing.
6. Top of nut elevation for all Fire Hydrants.

Overall Comprehensive Plan of Easements

1. All easements and as may be required for the installation and supply of services to the development and maintenance of any existing services which are known easements shall be filed with the Town on an Overall Comprehensive Plan and in a form approved by the Town's Solicitor.

Stormwater Management Pond / Facility

1. Topographic and/or bathymetric surveyed elevations are to be provided for the entire bottom / shape and size of the pond / facility, along with certification from the Developer's Engineering Consultant that the pond / facility is in accordance with the accepted design.
2. All plan and cross-section drawings included in the detailed design drawings that were "Accepted for Construction" are to be updated to reflect as-constructed conditions.

1.9 Closed-circuit Television (CCTV) Videos

CCTV videos required for sanitary and storm sewers are to be provided on USB thumb drive, complete with all videos in MP4 format as well as a digital and hard copy of the review report from the consultant, together with conclusions and recommendations from the Developer's Engineering Consultant of record.

In addition to CCTV inspections being required prior to Basic Services and again prior to Municipal Assumption, a CCTV inspection and summary report shall also be provided following any repairs completed on underground pipes.

2. ROADWAYS

2.1 General

The latest version of the Ministry of Transportation Geometric Design Standards and the Transportation Association of Canada (TAC) Urban Supplement to the Geometric Design Guide for Canadian Roads shall apply together with following Municipal standards.

All roadways shall be serviced as shown on the typical urban cross-sections, which are described in Section 14 of these standards (Standard Drawings). The Town will only consider urban cross-sections.

Temporary access roads not owned by the Town, leading to the area of the development, shall be maintained to a standard 150 mm granular 'A' builders road (at minimum), satisfactory to the Town.

Granular embedment for pipe trenches shall be placed in layers not exceeding 300 mm thick and shall be thoroughly compacted to minimum 95% standard proctor maximum dry density.

A "Road Occupation Permit" will be required from the Public Works Department for each driveway installation proposed and / or any works within the existing Municipal right-of-way in accordance with the Road Occupation Permit Policy. A fee is required for these permits, with a portion refundable upon satisfactory inspection by Public Works staff.

The Developer shall be responsible to install at minimum one geodetic benchmark for each phase of subdivision development at locations to the satisfaction of the Town. Geodetic Bench Marks shall be 1st and 3rd order for vertical and horizontal control respectively. Brass plaque to be provided by the Town.

2.2 Entrances / Driveways

Residential driveways shall be subject to the lesser of either: a) a relative maximum width of up to 55% of the width of the lot frontage, or b) an absolute

maximum width as follows:

- 6.0 m for dwellings without a garage or a single car garage,
- 7.6 m for double car garages, and
- 9.0 m for triple car garages.

For a residential dwelling containing an attached accessory dwelling unit, the driveway width shall not be more than 55% of the width of the lot frontage, and a minimum of 45% of the front yard of the residential dwelling unit shall be landscaped open space.

All residential entrances are to have a minimum longitudinal gradient of 2.0% and a maximum longitudinal gradient of 6.0%. The edge of residential driveways must be minimum 1.0 metre offset from side-yard lot line.

All commercial entrances are to have a minimum width of 9.0 m and a maximum width of 12.0 m (typical standard width of 9.0m), with a minimum longitudinal gradient of 2.0% and a maximum longitudinal gradient of 6.0%.

All driveways must include paved aprons, which shall be graded with a minimum of 150mm granular 'A' and paved with a minimum of 50 mm HL3 hot mix asphalt from the curb to the face of sidewalk. Where there is no sidewalk, the apron shall be 2.75m from back of curb, consistent with apron depth on the sidewalk side of the street and consistent with STD DWG No. 2A.

Where landscaping improvements are proposed adjacent to the driveway (i.e. driveway edging), driveway edging must be flush with the driveway surface (and back of curb, if applicable) to a minimum of 1.5 m beyond the edge of pavement/curb line. Where sidewalks exist along the frontage of the proposed dwelling, driveway edging must be flush with the driveway surface for a minimum of 500 mm beyond the back of sidewalk.

2.3 Driveway Culverts

Where development will utilize existing roadside ditch elements, the following culvert and driveway specifications will apply:

- a. Minimum culvert length, 6.0 metres
- b. Minimum culvert diameter, 400 mm (16 inches) and designed for a 5 year return storm frequency at minimum
- c. Culvert material to be galvanized corrugated steel pipe, 2.0 mm thickness and/or 320 kpa PVC or HDPE as per OPSD
- d. Architectural stone per Risi Stone Sienna Stone (or approved equivalent) or concrete headwalls are required on both ends of culvert to the satisfaction of the Public Works Department when the ditch is greater than or equal to 1 m in depth; shallower ditches may have other culvert end treatments such as stone, paving, or sod to the satisfaction of the Town.
- e. Minimum pipe gradient, 0.5%
- f. Maximum slope of roadside ditch, 3:1

- g. Roadside ditch and boulevards to be reinstated with 150 mm topsoil and sod
- h. Road shoulders and asphalt surface must be reinstated to original or better condition to the satisfaction of the Public Works Department.

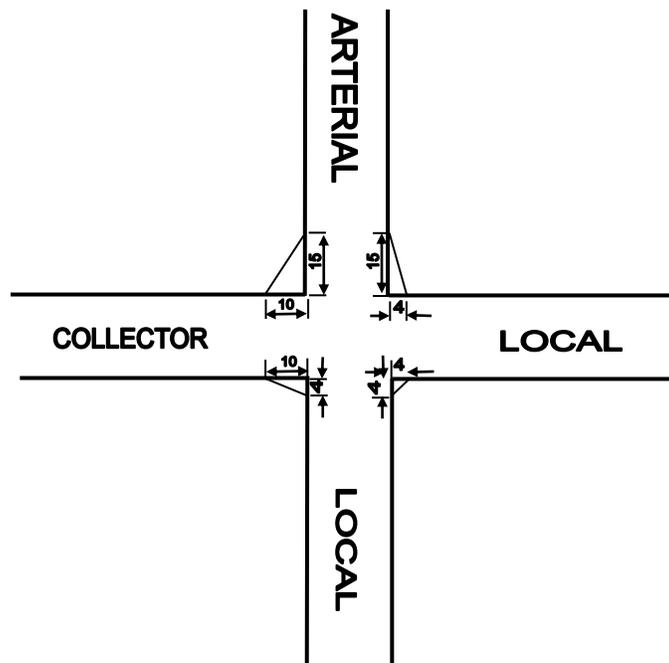
2.4 Parking Lot Design Requirements

- a. Minimum Parking lot gradients, 1.0%
- b. Primary access aisle minimum width, 7.3 m
- c. Secondary aisle minimum, 6.0 m
- d. Concrete barrier curb per OPSD 600.110 to be installed along the perimeter of the paved surface
- e. Line painting specifications and pavement markings (including directional arrows etc.) shall be provided per Ontario Traffic Manual Book 11
- f. Fire Route to be identified with minimum centreline turning radius of 12.0 metres per Ontario Building Code
- g. Parking lot surface water storage requirements shall be in accordance with Section 11.11.2
- h. Barrier free parking must be provided in accordance with Municipal Zoning Bylaw #2003-60 as amended and the Ontario Building Code.
- i. Pavement structure thickness shall be per Geotechnical recommendation report.
- j. Use of curbed landscaped islands and walkways to reduce the sense of expansive paved surface is encouraged.
- k. Snow storage locations.
- l. Lighting.
- m. Signage.
- n. On-road parking stall details as applicable.

2.5 Requirements for Local Urban Residential Roads

- a. Design speed, 40 km/hr min.;
- b. Minimum Centreline Curve Radius, 65 m;
- c. Horizontal and vertical stopping sight distance, 50 m min.;
- d. Street allowance, 20 m min.;
- e. Pavement width (not including gutters) - 8.5 m;
- f. The use of cul-de-sacs is discouraged, however, where necessary, cul-de-sac street allowance, 21.0 m R. min.;
- g. Edge of pavement in cul-de-sac, 15.0m R min.;
- h. Edge of pavement at intersection, 9.0 m R. min;
- i. Road grades, 0.5% min., 8% max. with curb and gutter;
- j. Sight triangle property requirements at all intersections shall be provided as follows:
 - 4.0 m minimum in length along local road right-of-way
 - 10.0 m, minimum in length along collector road right-of-way
 - 15.0 m minimum in length along arterial road right-of-wayor as may be otherwise determined by the Town Engineer with reference to the TAC Geometric Design Guide for Canadian Roads (Urban Supplement).

Intersection Sight Triangle Property Requirements:



- k. Changes in alignment where the deflection angle is greater than 45° shall provide a minimum property sight triangle of 4 m x 4 m.

2.6 Clearing and Grubbing

Clearing / cutting of trees shall only be permitted to occur outside of the nesting periods in accordance with the Migratory Birds Convention Act. According to Environment Canada, nesting periods may start as early as mid-March and extend to late August. In Wasaga Beach, the nesting period is generally between the beginning of April to middle / late August. Exact timing may change from year to year due to micro-climate conditions and variations in seasonal weather (i.e. early spring, cold, / wet winter, etc.). The Developer is responsible to confirm appropriate timing window at the time of proposed clearing by providing written recommendation / comment from their environmental consultant, to the satisfaction of the Town.

Trees shall be removed so that the specifications for sight distances, grading, ditching, etc., may be met. All stumps, logs, brush, boulders, debris, etc. shall be removed from the entire street allowance and deposited off the site to a disposal area approved by the Town.

Unless noted otherwise all healthy trees not obstructing visibility or installation of services shall be preserved. The Town Engineer or Director of Public Works may give special permission to leave trees on the street allowance.

The Developer is responsible to coordinate the delineation of tree clearing in accordance with Section 13 of the Engineering Standards and to the satisfaction

of Town staff prior to mobilization, including legal survey of the property to ensure that tree clearing does not encroach onto neighbouring properties or into adjacent vegetation buffers.

Where trees are removed from an existing municipal right-of-way, the developer must compensate the Town with replacements to the satisfaction of the Town.

2.7 Boulevard Grading

The boulevard area behind the curbs shall be graded at minimum 2% to maximum 6% towards the curbs.

All boulevards to the street line shall be protected with 150 mm minimum of screened topsoil, overlaid with nursery sod in accordance with Section 13 of the Engineering Standards.

2.8 Road Base Construction

All excavation shall conform to the current Ontario Provincial Specification for Grading OPSS 206.

The sub-grade shall be excavated or filled to the required grade for the required width between the curbs plus 500 mm behind the curbs. Where earth fill is required, including backfill for trench excavations, it shall be placed in lifts not exceeding 300 mm in depth and each lift shall be thoroughly compacted to minimum 95% of standard proctor maximum dry density.

All vegetation, boulders over 150 mm in diameter, topsoil and organic or frost-susceptible materials, shall be removed from the road base to a depth of at least 1.20 m below finished grade and replaced with suitable material. In swamp or other areas where the material at this depth is unsuitable, special treatment may be directed by the Town Engineer to be carried out, further to geotechnical recommendation.

All unsuitable excavated material shall be removed from the entire street allowance and deposited off the site to a disposal area approved by the Town.

The Developer shall retain a qualified soils consultant to carry out compaction tests on the completed subgrade and subsequent lifts of granular base material before placement of the next granular or asphalt lift.

The sub-grade shall be shaped to conform to the required longitudinal grade and cross-section and shall have a cross-fall of 3% from the centreline of the roadway to each side. If considered necessary by the Town Engineer, the sub-grade shall be compacted with suitable mechanical compaction equipment as required to produce a solid base for the road gravel. All soft spots shall be excavated and backfilled with granular base material.

The granular base shall be laid on dry, smooth, properly graded sub-grade, and

shall be spread for the required width to meet the edge of sub-grade. The granular road base shall consist of a bottom course of minimum 300 mm consolidated Granular 'B' material full width across the roadway behind the curbs. Granular top course shall be minimum 150 mm consolidated Granular 'A' material for local roads and minimum 200 mm for collector roads for the full width across the roadway and 500 mm behind the curbs, conforming in all respects to the Ministry of Transportation Ontario Provincial Standard Specifications. Where native fine sand is considered for granular base course, the top course of Granular 'A' must be increased by 50 mm.

The granular material shall be spread in layers of 300 mm maximum compacted depths, and each layer shall be thoroughly compacted to 100% standard proctor maximum dry density.

No granular base shall be placed until the grade on which it is to be laid has been inspected and approved by a Geotechnical Engineer and the Town Engineer. Proof-rolling of the sub-grade shall be witnessed by the Geotechnical Engineer and the Town Engineer prior to placement of the granular bases. During and between construction seasons, the granular base shall be maintained suitably for vehicle and pedestrian traffic including dust control by calcium chloride and renewed if required to the satisfaction of the Town Engineer.

All granular construction shall conform in all respects to Ontario Provincial Standard Specification OPSS 314.

2.9 Roadway Surface Asphalt (Base and Surface Courses)

The surface course asphalt may only be placed after a formal base course asphalt testing summary has been provided by a qualified geotechnical engineer and accepted by the Town Engineer. Approval for paving surface course asphalt for subdivisions shall not be given for at least one year from the date of placement of the base course asphalt and until 80% of the housing units have been constructed and the lot grading certificates have been issued for 80% of the lots. As well, a Certificate is required from the Developer's Engineer certifying that all works have been completed in accordance with the drawings that were "Accepted for Construction".

All asphalt shall be placed at the specified thickness and each layer shall be thoroughly compacted to 92% maximum relative density as specified in OPSS.MUNI 310 Table 10.

No asphalt shall be placed until the base on which it is to be placed has been inspected, repaired as necessary and accepted by the Town Engineer. Tack coat shall be applied to the base asphalt prior to placement of top course.

Asphalt work shall conform in all respects to Ontario Provincial Standard Specification OPSS 310.

Denso Re-instatement Tape (or approved equivalent) shall be applied to the

vertical face of the existing asphalt at all lateral and longitudinal joints on surface asphalt where new asphalt matches existing, including all road cuts. Denso Re-instatement Tape (or approved equivalent) may also be required for joints on base course asphalt pending anticipated timing for paving surface course asphalt and other related considerations at the discretion of the Town Engineer.

2.10 Curbs

Concrete curb and gutter conforming to Ontario Provincial Standards Drawing OPSD 600.040 – Concrete Barrier Curb with Standard Gutter shall be installed along existing roads to be urbanized, road widening projects and all collector and/or arterial roads.

OPSD 600.070 – Concrete Barrier Curb with Standard Gutter – Two Stage Construction shall be installed along all edges of the roadway paved surface in new developments. The second stage of curb construction shall only be permitted following the satisfactory inspection of the base curb and asphalt by the Town Engineer prior to placing surface course asphalt.

Curb terminations shall either be joined to existing concrete curbs or terminated as per OPSD 608.010.

Curb radii at commercial entrances shall terminate at the edge of the existing shoulder of the roadway per OPSD 608.010 and be provided with a minimum 5.0 m long hot-mix asphalt taper to match to the existing edge of pavement/ edge of travelled lane.

150 mm diameter pipe sub-drains shall be provided under all curb and gutter. Deletion of this sub-drain may be considered by the Town Engineer if supported by a report from a qualified soils consultant, in areas of native sand material only. Sub-drains shall be perforated, corrugated, plastic pipe with geotextile other than the 2 m section of sub-drain immediately upstream of all structures, which shall be non-perforated, corrugated pipe. Sub-drains shall be bedded in a 300 mm x 300 mm granular 'A' trench below and at each edge of the subgrade and shall conform to OPSS 405.

Concrete shall conform to Ontario Provincial Standard Specification for mix-design, placing concrete and curbing. Curb construction shall conform to Ontario Provincial Standard Specification OPSS 353. Curbs shall be bedded on the granular base construction and upon completion of the curbs, Granular 'A' backfill shall be placed behind the curb and thoroughly compacted to prevent the displacement of the curb by the subsequent Granular 'A' and asphalt operation.

The minimum longitudinal gradient along the gutter line is to be 0.5%; additionally, the gradient shall be minimum 0.5% for the outside radius of 90° crescents and cul-de-sacs.

2.11 Bicycle Lanes

Where applicable, bicycle lanes are to be provided on collector roads consistent with Ontario Traffic Manual Books 5, 11 and 18, and Town Std. Dwg. No. 3.

2.12 Sidewalks

Refer to Section 8.1.

3. TEMPORARY EROSION AND SEDIMENT CONTROL

Temporary erosion and sediment control measures during construction must be addressed on all projects, including the use of geotextile on the top of all catchbasins during construction.

The requirements of the Town of Wasaga Beach, Ministry of the Environment, Conservation and Parks, and the Nottawasaga Valley Conservation Authority and all other applicable agencies will apply.

The Developer shall consider the sensitivity of the downstream environment and the availability of on-site retention facilities when determining erosion and sediment control measures.

A mud mat must be provided in accordance to Standard Drawing No. 17 at all approved construction accesses to the site.

The developer will be responsible for clearing all mud tracked onto municipal streets and/or adjacent properties to the satisfaction of the Town.

The Erosion & Sediment Control Plan (Sec. 1.5) shall include the minimum control measures required to address temporary erosion and sediment control.

All sites shall be delineated with a 1.2 m high steel wire silt fence in accordance with Town Std. Dwg No. 16 and as directed by the Town Engineer.

The Developer shall monitor and properly maintain the control measures during construction and until such time as the control measures are no longer required. Maintenance shall include the removal of sediment accumulated by the control measures as determined by the Town Engineer to the satisfaction of the Town.

Should the proposed control measures prove to be ineffective, then other methods and controls shall be added subject to the approval of the Town Engineer.

Stockpiled material shall be limited to a maximum height of 8.0 m with maximum 2:1 slopes. Stockpiles shall be vegetated within 30 days of stockpiling with hydraulic seed and mulch and provided with silt fence around the top and base of the stockpile, to the satisfaction of the Town Engineer.

4. GRADING

All site grading must be maintained within the development lands and shall not extend into neighbouring properties without written consent from the neighbouring property owner.

4.1 House Lot Grading

Generally, all new lots shall be excavated or filled as follows:

- a. Wherever reasonably possible, the whole of the lot area shall drain from rear of the lot to the street line.
- b. The building apron shall be 300 mm minimum above the elevation of the centreline of the road.
- c. The slope from the curb to the rear of the building shall be a minimum of 2% and a maximum of 5%.

In situations where the slope of the land justifies different requirements, the Town Engineer may permit variations of the above. The Town Engineer retains the right to amend any of the grades proposed if a particular situation so warrants.

Lot/development site grading shall be designed such that check valves are not required in storm sewers to prevent spills for system surcharge situations. Any surcharging of the system in major storm events shall be conveyed to the SWM pond/facility/ultimate outlet via overland flow.

Engineered fill shall be placed in layers not exceeding 300 mm thick and shall be thoroughly compacted to 100% standard proctor maximum dry density, and as approved by the Geotechnical Engineer. The Overall Grading Plan shall identify all lots requiring engineered fill. Engineered fill shall be placed under direct supervision of the Geotechnical Engineer.

The "Lot Grading Plan" must show the proposed and existing lot grades at lot corners and finished grade level at building, underside of footing, basement floor, top of foundation wall and first floor elevations and shall be submitted to the Town Engineer for approval. The Town Engineer retains the right to amend any of the grades proposed if a particular situation so warrants.

The underside of footing elevation must be a minimum of 300mm above the seasonal high groundwater table elevation. Top of basement slab must be a minimum 500 mm above seasonal high ground water table. Recommendations shall be included in the Geotechnical Report with respect to seasonal groundwater fluctuations to assist with the determination of the underside of footing elevation, to the satisfaction of the Town Engineer.

The "Lot Grading Plan" shall also identify rear yard drainage swales to be constructed by the Developer, complete with topsoil and sod.

All lots shall be completely sodded as part of the requirements for occupancy, subject to seasonal limitations. Should occupancy be requested between November 1 and May 1, the sodding provision will be waived until the following June 15, at which time the sodding must be completed. Sod shall be rolled.

Topsoil is to be minimum 150 mm thick and screened clear of all stones, debris and woody material to the satisfaction of the Town in accordance with Section 13 of these Standards.

A topsoil quality report must be submitted prior to the start of work to confirm quality consistent with the requirements of Section 13.2 of the Engineering Standards.

A certificate of lot grading and associated checklist in municipal format shall be completed for each lot and block. The certificate must be certified by a professional engineer.

An example Lot Grading Certificate and associated checklist can be found in Appendix A.

For infill lot design criteria, refer to the Town Building Department's "Infill Lot-Grading and Drainage Policy".

Maintain the existing or natural grade at property lines. Avoid artificially raising or lowering grades that would require the use of retaining walls, which would adversely affect water run-off and/or connectivity to adjacent properties.

Avoid the use of retaining walls along street frontages, parks and other open spaces areas, and abutting adjacent properties. Where a retaining wall cannot be avoided and the grade change is greater than one metre, the wall should be set back from the property line and terraced to provide an appropriate transition.

4.2 Imported Fill Material

Any fill imported to a development site requires geotechnical confirmation/certification regarding the source of the material and the suitability of its intended use. This is in addition to the geotechnical Certification of engineered fill for each lot. If the material source is from any site other than a licensed source pit/quarry, then the geotechnical certification must also indicate that the material has been tested for contamination and has been confirmed to be "clean fill".

All soils to meet O.Reg 406/19. Additional supporting and informative references in terms of imported fill can be reviewed at the following website: <https://www.ontario.ca/page/rules-soil-management-and-excess-soil-quality-standards>.

4.3 Swales

- a. The preferred minimum lot grading swales is 2.0%.
- b. The minimum gradient for all rear and side yard swales in native sandy soil material shall be 1.0%.
- c. The minimum gradient for all rear and side yard swales in any soil material other than native sand material shall be 2.0%.
- d. Side and rear lot swales shall be well defined.
- e. Although not preferred, when unavoidable to design with swales with gradients less than 1.0%, a 150 mm diameter pipe sub drains shall be provided. Sub-drains shall be perforated, corrugated plastic pipe with geotextile placed at 0.5 m offset property line. Sub-drains shall be bedded in a 300 mm x 300 mm clear stone trench below the swale and shall conform to OPSS 405. In such cases, the subdrain is to connect to a positive outlet (e.g. RLCB, etc.).
- f. The maximum length of a rear lot swale to a positive outlet or rear lot catchbasin shall be the least of 75 m or six (6) lots width (eight (8) lots width for townhouses).

4.4 Parkland Grading

The area of land deeded to the Town for public purposes other than highways shall be carefully graded to provide positive surface drainage, care being taken to preserve existing trees.

The whole area shall have or receive at least 150 mm of topsoil and shall be sodded in accordance with Section 13 of the Engineering Standards.

See Appendix H for Park Standards.

5. UTILITIES

5.1 Telephone/ Cable TV/ Gas

Telephone and cable television services shall be underground and shall be installed by the applicable utility company.

Telephone and cable television service pedestals shall be installed within the Municipal right-of-way at 300 mm from the right-of-way property line and located at lot lines.

Gas service must be provided for all subdivisions and site plans.

The Developer's Engineer must coordinate the installation of all utilities. The telephone and cable television services are installed at the same time in the assigned location within the right-of-way.

The Developer must bear the cost of any surcharges for underground

installations and must grant any easements for their services.

5.2 Electrical Distribution And Transformation

The electrical distribution and transformation services shall be dealt with under the direction and approval of Wasaga Distribution Inc. and details of same are available at their offices located at #950 River Road West.

Designers must allow for a minimum of 3 m x 3 m construction footprint for transformers to accommodate the grounding grid installation.

Transformers must not be located on the same lot line as a fire hydrant and should generally be separated by two lot lines wherever possible (i.e. generally 30 metres separation for 15 metre wide lots). Additionally, in all circumstances, transformers must be located a minimum 5 metre separation from fire hydrants.

5.3 Utility Plans

A Composite Wire Utility Plan is required for review and acceptance which shall include a signature block for all utilities to sign and date and to ensure there are no conflicts with drainage or other design components.

Municipal Consent (MC) drawings are required for all utility installations in existing road allowances.

MC Clearance Guidelines (Preferred)

All Dimensions in Millimetres (mm)	Preferred Vertical Clearance	Preferred Horizontal Clearance
ELECTRICITY Wasaga Distribution Inc.		
Conduits	500	1500
Transformers	1500	1500
Streetlights	1500	1500
GAS Enbridge		
Gas main < 400 mm (16") diameter	500	1500
Gas main >= 400 mm (16") diameter	1500	3000
Above ground regulator stations	1500	1500
BELL Telecommunications		
All buried infrastructure	500	1500
Above ground infrastructure	1000	3000
ROGERS Telecommunications		
All buried infrastructure	500	1500
Above ground infrastructure	1000	3000
ROAD		
Clearance from road, curb, sidewalks	1000	1000
Clearance from catchbasins	1000	1500

Above ground plant clearance from Traffic Signal Poles	1000	1500
Above ground plant clearance from Controller Boxes	1000	1500
Above ground plant clearance from Fire Hydrant	1000	3000
Buried plant clearance from Fire Hydrant (incl. lead & valve)	1000	3000
Water Supply		
Services	1000	1000
Mainline 100 mm - < = 400 mm diameter	1500	1500
Mainline >= 400 mm diameter	2000	2000
Valve Chamber	2000	2000
Storm Sewer (incl. CB & Subdrain)		
< 100 mm diameter	1000	1000
100 mm >= 750 mm diameter	1500	1500
>= 750 mm diameter	2000	2000
Maintenance Hole	2000	2000
Sanitary Sewer		
Services	1000	1000
Mainline 200 mm to <= 375 mm diameter	1500	1500
Mainline >=375 mm diameter	2000	2000
Maintenance Hole	2000	2000

6. LIGHTING

6.1 Street Lighting

Street light fixtures shall be Cree RSW cobra head style luminaires (black) mounted on elliptical black powder finished arms. Arms shall be fastened to direct buried, octagonal, tapered, polished, eclipse black, concrete poles, all to the satisfaction of the Town. The concrete poles and arms shall be StressCrete, Class C, 30' (9.14m) in full length with pole grounding and complete with 8-FINCAP.

Streetlights on local residential roads shall be provided on the sidewalk side of the roadway in accordance with Town Std. Dwg. No. 2A. The minimum requirement for streetlighting on local residential roads shall be LED Cree RSW as noted above, generally at a maximum spacing of 35 m on lot lines and/ or as required to provide roadway illumination in accordance with the ANSI / IESNA RP-8-18 Roadway Lighting Manual as follows:

Road and Pedestrian Conflict Area		Pavement Classification (Minimum Maintained Average Values)			Uniformity Ratio E_{avg}/E_{min}	Veiling Luminance Ratio L_{vmax}/L_{avg}
Road	Pedestrian Conflict Area	R1 lux/ft	R2 & R3 lux/ft	R4 lux/ft		
Major	High	12.0/1.2	17.0/1.7	15.0/1.5	3.0	0.3
	Medium	9.0/0.9	13.0/1.3	11.0/1.1	3.0	0.3
	Low	6.0/0.6	9.0/0.9	8.0/0.8	3.0	0.3
Collector	High	8.0/0.8	12.0/1.2	10.0/1.0	4.0	0.4
	Medium	6.0/0.6	9.0/0.9	8.0/0.8	4.0	0.4
	Low	4.0/0.4	6.0/0.6	5.0/0.5	4.0	0.4
Local	High	6.0/0.6	9.0/0.9	8.0/0.8	6.0	0.4
	Medium	5.0/0.5	7.0/0.7	6.0/0.6	6.0	0.4
	Low	3.0/0.4	4.0/0.4	4.0/0.4	6.0	0.4

Table 2: Illuminance Method - Recommended Values

Lighting Design Criteria for Streets		Average Luminance	Average Uniformity Ratio	Maximum Uniformity Ratio	Maximum Veiling Luminance Ratio
Street Classification	Pedestrian Activity Classification	L_{avg} (cd/m ²)	L_{avg}/L_{min}	L_{max}/L_{min}	L_{vmax}/L_{avg}
Major	High	1.2	3.0	5.0	0.3
	Medium	0.9	3.0	5.0	0.3
	Low	0.6	3.5	6.0	0.3
Collector	High	0.8	3.0	5.0	0.4
	Medium	0.6	3.5	6.0	0.4
	Low	0.4	4.0	8.0	0.4
Local	High	0.6	6.0	10.0	0.4
	Medium	0.5	6.0	10.0	0.4
	Low	0.4	6.0	10.0	0.4

Table 3: Lighting Design Criteria for Streets

L_{avg} = Maintained average pavement luminance

L_{min} = Minimum pavement luminance

L_{vmax} = Maximum veiling luminance

Streetlights on collector and arterial roads shall be staggered on both sides of the roadway in accordance with Town Std. Dwg. No. 2B. Streetlight installation on arterial and collector roads shall include banner arms and duplex receptacle complete with ground fault interruption (GFI). The minimum requirement for collector and arterial road lighting shall generally be at a maximum spacing of 70m on both sides of the road and/or as required to provide roadway illumination in accordance with the ANSI / IESNA RP-8-18 Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting as per above Tables 2 and 3.

Each fixture shall be controlled by a dusk-to-dawn photo-electric cell and be fused. Power feed shall be completely underground. The light shall generally be placed on the outside of horizontal curved roadways.

Particular care shall be taken to adequately illuminate the intersections and pedestrian crossing areas.

A photometric point plan shall be submitted to demonstrate illumination levels, shown in Lux, for the proposed development road allowance areas. The plan shall show from street property line to street property line, demonstrating that there is no light trespass on private properties.

All lighting shall be “dark sky” compliant and shall be 3000K, complete house shielding.

Where overhead hydro has been permitted, the hydro poles located in the road allowance, may be used to carry the street lighting.

The fixture, manufacturer, model, style, power, height, Kelvin, fixture arm length, and pole spacing requirements shall be as set out above, and as reviewed by Wasaga Distribution Inc. and final approval by the Town.

Electrical Safety Authority approval is required for all streetlight systems.

The developer shall provide the Town of Wasaga Beach Public Works Department with one extra luminaire per development, for future maintenance/replacements.

6.2 Parking Lot Lighting

A photometric point plan is required for site plans submissions, demonstrating that the site does not adversely affect neighbouring properties or municipal rights-of-way.

Parking lot lighting, together with building security lighting facilities shall be identified on the plan.

Parking lot luminaires are to be “dark sky” compliant and shall be 3000K.

The fixture ,manufacturer, model, style, power, height, Kelvin, fixture arm length, and pole spacing requirements shall be as reviewed by the Wasaga Distribution Inc. and final approval by the Town.

7. STREET NAME AND TRAFFIC SIGNS, AND TRAFFIC SIGNALS

7.1 Signs

Proposed street names shall be subject to the approval of the Town.

At each intersection there shall be erected approved double sided street name signs. The signs will be provided by the Developer and mounted by the Developer on “U” flange galvanized metal posts, 3.75 m long, embedded 1.2 m in the ground prior to Certificate of Substantial Completion (Basic Services).

Traffic signs shall be provided by the Developer and mounted on a “U” flange galvanized metal posts, 3.75 m long, embedded 1.2 m in the ground. The shape, colour, height and location of traffic signs shall be in accordance with the Ontario Traffic Manual as published by the Ministry of Transportation. All regulatory signs shall be manufactured using “High Intensity” sheeting conforming to ASTM D4956-90 Type III or Type IV material.

Square metal posts with breakaway sleeves are to be used at all locations where signs are installed in hard surfaces (i.e. asphalt, concrete pavers, etc.).

Street name signs material to be 160mm high extruded aluminum blades with a bulb “T” top and bottom. Green high-intensity grade reflective background with pre-cut 90mm white high-intensity upper case block highway lettering. All vacuum applied. The suffix of each road name “Ave., Blvd., Rd., St.,” etc. is to be abbreviated. Street name signs not to be mounted on same post as stop signs. Street sign must be mounted on its own post in a quadrant other than the stop signs.

7.2 Traffic Signals

Please see the Approved Materials List in Appendix G for the Town of Wasaga Beach specifications for traffic signal controller box and related materials.

8. PEDESTRIAN FACILITIES

8.1 Sidewalks

All sidewalk construction must conform to OPSD 310.010, OPSD 310.020, OPSD 310.030 and OPSS 351. Sidewalks shall be a minimum 1.50 m wide and provide a minimum 100 mm thickness Granular ‘A’ bedding compacted to

minimum 95% standard proctor maximum dry density. Location of sidewalk in roadway shall be per the Town Engineering Standard drawings in Section 14.

Expansion joints shall be provided at minimum 6.0 m spacing (i.e. every four bays) and/or where the sidewalk abuts a rigid object or changes direction. Dummy joints are to be provided every 1.5 m spacing.

Sidewalks are to be continuous through commercial, industrial and institutional driveways.

All sidewalk designs must satisfy the requirements of the applicable Provincial legislation for accessibility. This shall include but not be limited to, where a curb ramp is provided at a pedestrian crossing, it must have tactile walking surface indicators to the satisfaction of the Town. Tactile plates shall be as per OPSD 310 Series, installed at 150mm behind and parallel to the back of drop curb, and shall be cast iron with a natural finish. Anchored cast iron plate such as TufTile or approved equivalent may be accepted at the discretion of the Town Engineer.

Sidewalks are not required on cul-de-sacs, unless there is a pedestrian trail at the end of cul-de-sac.

8.2 Walkways

Walkways shall be constructed of 150 mm thick concrete surface conforming to OPSS 351 on a 150 mm thick Granular 'A' compacted to minimum 95% standard proctor maximum dry density, and minimum width of 3.0 m. Concrete walkways shall be constructed in conformance with Town Std. Dwg. No. 7.

Walkways located between two adjacent residential lots shall be fenced with a - 1.8m tight board privacy fence installed in accordance with OPSD 972.130. The height of the fence shall be reduced to 1.2m for the frontage of the lot in accordance with the Town's Zoning By-law.

All walkway designs must satisfy the requirements of the applicable Provincial legislation for accessibility.

Walkways that also function as an overland flow route shall have a minimum width of 6.0 m and shall have a cross-section designed to convey the major storm events within the block.

Streetlights shall be provided at the access and egress of walkways.

8.3 Trails

Walking and biking trails shall be constructed 3.0 m width of 100 mm thick limestone screenings over 100 mm minimum Granular "A" base material compacted to minimum 95% standard proctor maximum dry density over Terrafix 270R geotextile (or approved equivalent). Site preparation must include clearing trees for a width of 5m (additional 1 m on either side of trail), stripping of topsoil

and uniform grading of the trail way.

Trail routes may meander to avoid disturbance to existing vegetation, but must not be located within 6.0 metres of adjacent private property. Exact location and clearing limits to be determined on site in consultation with Town staff prior to construction.

All entrances to trails are to be posted with “No Motorized Vehicle” signs and access is to be restricted by removable entrance posts to provide a minimum clear entrance width of 1.5 m per Town Std. Dwg. No. 8.

Trail design must have regard for existing/ proposed drainage patterns and may require culvert installations at designated locations.

8.4 Transit Shelters

8.4.1. Concrete Pad

This standard is to be read in conjunction with Town sidewalk standards in Section 8.1 of these Engineering Standards.

The transit shelter concrete pad size should extend 300mm on all sides beyond the shelter footprint, or a total of 600mm larger than both the length and width dimensions of the shelter. The standard shelter is 5'x10' and therefore the standard concrete pad shall be minimum 7'x12' (i.e. 2.13m x 3.66m).

Base material shall be constructed with a minimum 150mm thickness Granular 'A' bedding, compacted to a minimum 95% standard proctor maximum dry density prior to pouring concrete.

Concrete pads shall be:

- 200mm thick concrete.
- Concrete to be reinforced with Fiberglass mesh screen or steel re-bar as approved by the Town.
- A minimum 28-Day Compressive Strength of 30 MPa.
- Broom finished.
- On urbanized roads, the pad for the shelter as described above shall be located behind the sidewalk, and a concrete pad with minimum width of 2.4m shall extend from the sidewalk to the back of curb for connectivity from the shelter to the bus stop location.

All bus shelter pads are to be sloped 2% towards the road unless otherwise noted.

Where an edge(s) of a concrete shelter pad are adjacent to curb and/or sidewalk an expansion joint shall be used.

All Transit Shelter designs must satisfy the requirements of the applicable

Provincial legislation for accessibility.

8.4.2. Bus Shelter

Public transit bus shelters shall be approximately 5'x10' Avanti Shelter supplied by Daytech Limited (specified dimensions = 58 15/16" x 131 1/4"), or approved equivalent complete with:

- All glass walls.
- Clear polycarbonate multi-wall (cellular) roof material.
- Double sided display.
- 44" (L) easy access bench complete with arm rests.

All Transit Shelter designs must satisfy the requirements of the applicable Provincial legislation for accessibility.

9. WATERMAIN DISTRIBUTION

9.1 General

Under the Ministry of the Environment (MOE) Municipal Drinking Water License process, the Town of Wasaga Beach was issued a Drinking Water Works Permit (DWWP) on July 18, 2011. With the DWWP, most alterations of the Town of Wasaga Beach Drinking Water System by addition, modification, replacement or extension must satisfy the requirements of the Town's Drinking Water Works Permit (#131-101). Therefore, submissions are made directly to the Town of Wasaga Beach Public Works Engineering Department for approval.

Watermain designs shall comply with the Ministry of the Environment Design Guidelines for Drinking Water Systems and must be reviewed and approved by the Town in accordance with the Town's Drinking Water Works Permit.

All watermain fittings, pipes and appurtenances shall be CSA Certified and in accordance with the Town approved materials list as amended.

Watermains, hydrants and house service connections shall be provided to serve the whole of the development and shall be compatible with adjacent developments.

The subdivision shall have a minimum of two feeds from the existing Town distribution system. Refer to Section 9.2 below. For private roads / private water systems, an Omni C2 bulk water meter is required on all feeds.

As part of the design review process, a water distribution system analysis of flows, pressures, fire flows, etc. shall be undertaken using the Town's water system model in Water CAD at the discretion of the Town Engineer. The analysis shall demonstrate that the development's distribution system maintains a minimum system pressure of 350 kPa (50.8 psi) under normal operating

conditions.

Watermain pipe joints shall be mechanically restrained on both sides of all valves and at fire hydrants, termination points and changes in direction or pipe size and all areas of engineered fill. Restrained lengths are to be calculated by the developer's engineer and approved by the Town engineer. A factor of safety of 1.5:1 shall be used for the minimum distance calculations. Restrainer limit lengths shall be identified on the design drawings.

Test connections shall be completed in accordance with Town Std Dwg No. 13 – Water Distribution System 50 mm Test Point By-Pass, or approved equivalent.

All private developments require an Operations and Maintenance Manual for the regular inspection and maintenance of all private watermain, valves and fire hydrants. Guidelines for the preparation of the Operations and Maintenance Manual can be found in Appendix E.

All connections to municipal mains must be undertaken by a Town approved contractor in the presence of Municipal water / sewer staff and/or Town Engineer. All active main valves must be operated by certified municipal staff. A minimum 48 hours notice is required to be given to the Town Engineer when scheduling these works.

9.2 Piping

Watermain pipe shall be gasketed PVC (DR 18) conforming to AWWA C900, for pipes up to 300 mm diameter with PVC fittings and/or ductile iron, cement lined mechanical joint fittings with mechanical restraints and cathodic protection. A different pipe strength or type may be required by the Town for larger pipe sizes and for special conditions.

Pipes shall be bedded in accordance with OPSD 802.010.

The nominal cover on the watermains, hydrant branches and services shall be 1.7 m at all points. Watermains and services shall be backfilled with approved granular material and thoroughly compacted in layers.

The PVC pipe installation shall include a white 12 AWG TWH solid plastic covered tracer wire, TW4 75°C 600 V or approved equal. The installation of the tracer wire shall provide for a connection at the flange of all fire hydrant barrels and mainline valves as noted on Town Std. Dwg. No. 6 Hydrant and Valve Detail. Tracer wire shall also be provided along all water services to the property line, and brought to the surface on the outside of water valve. Splice connections of tracer wire shall be completed using DryConn waterproof connectors (or approved equivalent). Tracer wire continuity of current must be tested and certified by Public Works staff prior to acceptance and placement of base course asphalt.

Watermains shall be adequately sized to provide fire protection. The minimum

size shall be 150 mm diameter and as may be required by the Town.

Cathodic pipe protection is required at metal pipes and fittings with Zinc anodes at mechanical fittings.

For the purpose of water quality, all new pipe systems must be looped and connected to the existing municipal water distribution system at a minimum of two locations. If this cannot be provided, a local 50 mm dia. pipe loop connected to a minimum of four (4) individual services is required to maintain constant flow and satisfactory water quality within the system. Alternatively, an auto-flusher may be provided at the Developer's cost. A Hydro-Guard HG-4 Longneck Standard may be supplied by Public Works at the Developer's expense, or it may be obtained by the Developer, to the satisfaction of the Town Engineer. A meter within a meter pit is required on the service line leading to the auto-flusher.

9.3 Testing Requirements

The Developer's consultants and/or contractor shall produce and provide a comprehensive proposed swabbing, chlorination, and pressure testing procedures and plan. Testing is to be undertaken by a qualified third party company approved by the Town. The consultant is to provide a written proposal regarding how the testing is to be conducted in keeping with current standards seven (7) days prior to testing.

All watermains shall be tested, swabbed, flushed and disinfected in accordance with current OPSS.MUNI 441 specifications. A minimum of three (3) swabs are to be used per line. Insertion of the swabs is to be witnessed by Town staff at the time of swabbing. Pressure testing shall be completed for maximum 300m length test sections. All proposed testing procedures and processes are to be provided in writing with specific details to the Engineering and Public Works Department for review and approval prior to commencement of any testing works.

Hypochlorite for disinfecting shall be NSF certified for all watermain works.

The procedures for disinfecting watermains shall be in accordance with the latest revision of AWWA C651. The Developer shall arrange the watermain test and shall inform the Town Engineer when a section has completed a satisfactory pre-test for leakage testing and is ready for the final leakage testing inspection. A minimum of 48 hours notice is required prior to testing for the Town Engineer to coordinate with Public Works staff for operation of valves. Any sections failing the test shall be repaired and retested at the Developer's expense.

Two series of bacteriological tests are to be conducted in accordance with AWWA C651 after residual chlorine level testing and system flushing to re-establish municipal system chlorine levels. The AWWA C651-14 revision indicates that the purchaser has two options for bacteriological testing for total coliform analysis as follows:

“Option A: Before approving a main to go into service, take an initial set of samples and then resample again after a minimum of 16 hr using the sampling site procedures outlined (in the AWWA Standard). Both sets of samples must pass for the main to be approved to go into service.”

“Option B: Before approving a main to go into service, let it sit for a minimum of 16 hr without any water use. Then collect, using the sampling site procedures outlined (in the AWWA Standard) and without flushing the main, two sets of samples a minimum of 15 min apart while the sampling taps are left running. Both sets of samples must pass for the main to be approved to go into service.”

The Developer / contractor is responsible to arrange for a certified technician to obtain water samples for bacteriological testing. Bacteriological testing shall be undertaken by an accredited laboratory and the results shall be in accordance with the Ministry of the Environment Guidelines.

Prior to connecting new watermain to the municipal distribution system, the Developer must provide satisfactory bacteriological test results to the Town Engineer. An approved, qualified third party shall take the test samples with Town staff present to witness sampling. Samples are to be sent to an approved laboratory, which is to be confirmed in writing to the satisfaction of the Town. The Town requires a copy of the chain of custody report for file.

In the event that the final connection is not made within ten (10) days of the Town providing notification. The Town will take a residual chlorine reading. If the residual reading has fallen below 0.05mg/L the Town will require additional flushing and sampling of the water system prior to final connection.

9.4 Valves

Resilient seat gate valves shall be installed at each location of the intersection of street lines (i.e. three valves at tee intersections and four valves at cross intersections) to allow the isolation of each section of watermain between intersections. When streets extend for greater than normal distances without intersections the Town or the Town Engineer may require additional valves at intermediate points. Maximum 300 m distance between valves. Valve locations to be approved by Public Works staff.

All valves at points of termination of a stage of construction shall be restrained with two additional lengths (i.e. 12.0m) of watermain pipe beyond the gate valve. Watermain pipe termination shall be plugged and restrained complete with a minimum 50 mm blow off as per OPSD 1104.030.

Where watermain valves are located within the travelled road surfaces, top of the valve box shall be set flush with the paved road surface and a 0.5 m tapered asphalt apron provided if located in gravel shoulders.

Gate valves shall be resilient seat "open left" complete with valve boxes with 125 mm diameter lids marked WATER, all in accordance with the Town approved materials list. Valves shall be joined to the pipeline with anchor tees, tie-back

rods or by using mechanical joint restrainer gland rings with cathodic protection.

“Live taping” into existing watermains must be undertaken by a contractor that is approved by the Town.

Air release valve chambers shall be provided at system high Points and drain valves shall be located at low points per MOECC Guidelines.

9.5 Backflow Preventers

Backflow protection must be provided in accordance with the Ontario Building Code and applicable Provincial Regulations.

When backflow prevention is required under the Ontario Building Code, a Reduced Pressure Zone Backflow Preventer per the Town approved materials list must be enclosed in a chamber in accordance with Town Std. Dwg. No. 15A or the building mechanical room at commercial, industrial or institutional services as deemed necessary by the Town Engineer.

The owner is responsible for annual inspection and certification to verify conformance with the Building Code. The annual inspection / certification reports are to be forwarded to the Town’s Building Department.

For watermain testing purposes, a flow meter may be provided by Public Works (pending availability) or else supplied by the contractor as applicable. Backflow preventer installation and backflow testing shall be done by a plumber certified in backflow prevention, and witnessed by the Developer’s Consultant. A copy of the certification is to be provided by the Developer’s Consultant to Town staff.

9.6 Hydrants

Hydrants shall be CSA Certified and in accordance with the Town approved materials list as amended.

Anti-tampering devices are to be installed following completion of testing of system by the Developer to the Town’s satisfaction and following completion of all testing to be completed by Public Works (i.e. continuity, gate valves, curbstops and fire hydrant testing). The anti-tampering devices are to remain on all fire hydrants throughout the duration of site building construction, and then are to be removed by the Developer at the end of the warranty period, prior to municipal assumption of the roads for the final phase of the development.

Hydrant leads shall be 150 mm dia. and shall have a shut-off valve per the Town approved materials list, placed 1.50 m from the hydrant. Hydrants shall be located at lot lines and spaced at a maximum distance of 150 m in residential areas and 90 m in commercial and industrial areas. A hydrant shall be placed at the end of every cul-de-sac and dead-end street within a maximum distance of 15 m from a sanitary Maintenance hole for maintenance and flushing purposes.

Hydrants must be non-self-draining (internally plugged) and shall be equipped with two hose connections plus a pumper connection, complete with factory installed Storz fitting. All hydrant leads shall be installed at 1.7m depth of cover with provision for extension at the surface for adjustment to street lines grades. Hydrant flanges shall be set 75 mm to 100 mm above finished grade.

Hydrants shall be painted to conform to the Town's standard colours: yellow barrel with silver top and black storz connections and caps. Yellow paint shall be Colour No. 236 as manufactured by BEHL Chemicals Inc. of Milton, Ontario or approved equivalent.

Hydrant markers shall be flange mounted FlexStake FH800 Series American, yellow in colour with a height of 1.8m mounted on the back flange nut. The markers shall have the standard hydrant symbol at the top of the marker and be installed with a high visibility green reflective striping around the marker under the hydrant symbol.

Hydrants and markers shall be installed as per the Town of Wasaga Beach - Hydrant and Valve Detail Town Std. Dwg. No. 6.

Each fire hydrant is to have a "Pump After Each Use" sticker affixed to front of the hydrant, above the storz connection cap. The stickers are to be supplied by the Public Works Department and applied to hydrants by the Developer's contractor.

9.7 Residential Services

Each freehold housing unit shall have a separate 25 mm minimum dia. water service per the Town approved materials list, complete with tracer wire from the main to the property line. A curb stop and extension service box and main stop must be installed on each service using compression joint fittings. Curb stops are to be non-self-draining. Curb stop installation must include a 100 mm cedar block under the curb stop with a 2.5 m long, 25 mm dia. tail piece extending to the surface at 1.5 m into the private property / back from the right-of-way property line. Water services on private property shall be installed on the property to be serviced and in no case shall cross a property line into or pass through other private property.

Water service fittings shall be as per the Town approved materials list.

Curb stops shall be located on the street line and are typically located in the centre of the lot, unless an appropriate location is established with the owner prior to construction, and at 1.5 m separation from the sanitary sewer services. The designer shall try to avoid locating curb stops within the driveway wherever possible. The service shall always be a minimum of 1.5 m offset from the side property line. Service connections to watermains shall be made by direct tapping for ductile iron or with broad band stainless steel saddles on PVC.

A 12 lb. zinc anode shall be installed on each copper water service using a hydro type galvanized clamp.

The Public Works Department will supply residential water meters, touch pad and transmitters at the expense of the Owner, and the Owner shall be responsible for the installation. The touch pad and transmitter shall be located on the exterior of the building beside the hydro meter (minimum 150mm separation) and shall be accessible to the Town's agent.

Residential water meter specifications and installations shall be in accordance with Town Std. Dwg. No. 14A. The builder shall install the full assembly from the water meter inside the dwelling, out of the building with wire up to and including installation of the touch pad. The Flexnet Transmitter will be installed by Town Public Works following inspection and acceptance of works.

The cost of the water meter, transmitter, and subsequent installation shall be at the owner's expense. The meter shall be installed at a location approved by the Town.

Unless otherwise directed by the Town Engineer, decommissioning of existing water services shall include exposing the service connection at the watermain, closing the main stop and capping the main stop, then removing a short length of the existing water service (minimum 300mm). Decommissioning shall also include removal of the existing curbstop, which may be returned to the Town's Public Works Department at the discretion of the Town Engineer. Full removal of the existing decommissioned water service is encouraged, should the opportunity exist. For any water service 50 mm Ø or greater, removal of the abandoned water service between the main stop and curb stop is required.

9.8 Commercial/Industrial/Institutional Services

The standard size for potable commercial/industrial/institutional water services is 38 mm dia. unless otherwise demonstrated by the developer's engineer in accordance with the calculations of the Ontario Building Code.

Where applicable, the Town requires the following provisions for commercial/industrial/ institutional water services and dedicated fire lines:

- Provide a single individual service to property line sized applicably for both domestic and fire protection.
- Where on-site fire hydrants are required, minimum pipe size shall be 150 mm dia. with calculations to be provided to the Town to demonstrate pipe sizing needs on site.
- Minimum watermain size along frontage of school block is typically 300mm dia., to be checked through the Town's water distribution model to confirm sufficient domestic flow and fire protection.

- Main line valve to be placed 300 mm offset property line within the right-of-way and marked.
- On-site line split for domestic and dedicated fire supply to occur within the property.
- At the point of separation, both lines must have independent valves.
- Protection from contamination must conform to latest addition of the Ontario Building Code with Backflow Preventers.
- Face of the building must be within 90 metres of street hydrant.
- Face of portable units must be within 90 metres of site hydrant.
- Siamese connections must be within 45 metres of site hydrant.
- Domestic line shall make provision for a water meter per Town Std. Dwg. No. 14A or 14B as applicable. The owner must purchase commercial, industrial or institutional meters from the supplier.
- PVC and PE pipe must be installed complete with tracer wire. A continuity test must be undertaken and certified by Public Works Staff prior to acceptance.
- All site watermains must be swabbed, flushed, chlorinated and pressure tested in accordance with the Ontario Provincial Standard Specifications and Section 9.3 of these Standards. All internal building mains must be installed and tested in accordance with the Building Code. All tests must be certified by the Town.
- All connections to existing municipal supply lines must be inspected by a representative of the Wasaga Beach Public Works Department prior to backfilling operations.

9.9 Miscellaneous

All water services, hydrants and other works required on any section of watermain shall be completed prior to construction of the road base.

Extra fittings shall be installed at any point on watermains as required by the Town Engineer.

The Town will not be responsible for any costs arising out of the construction of watermains for the development.

Upon completion of the work, and prior to the issuance of Building Permits, Water and Sewer Service Record Sheets (one for each lot) shall be prepared by

the Developer's Engineer and turned over to the Town Engineer for review and acceptance. The sheets shall show clearly:

- (a) Registered plan number and Roll number;
- (b) Lot, lot number and street lines;
- (c) Swing ties from the end of the services to the lot property bars and/or other permanent street features and information as per Section 1.9 of these Engineering Standards;
- (d) North arrow;
- (e) Type, diameter and depth below grade at the end of each service
- (f) Any other pertinent information

All valves, curb stops and hydrants must be inspected for accessibility and operation prior to Substantial Completion (Basic Services) and prior to Municipal assumption.

10. SANITARY SEWERS

10.1 General

Sanitary sewers and house service connections to the street line shall be provided to serve the whole of the development and shall be compatible with adjacent developments and sized to accommodate external flows within the drainage catchment area.

Sewers and house service connections to the street line shall be installed prior to road base construction. Each housing unit shall have a separate service to property line in accordance with Std. Dwg. No. 12.

Sanitary sewer design shall comply with the Ministry of the Environment & Climate Change Design Guidelines for Sewage Works.

Final drawings of the system shall be submitted to the Ministry of the Environment, Conservation and Parks for approval and final approval by the Town will not be given until the Ministry's Environmental Compliance Approval is obtained.

Sanitary sewers shall be connected to the Town's sanitary sewer system at locations approved by the Town and the Ministry of the Environment.

The following design parameters shall be used for sizing sanitary sewer pipes and sewage pumping stations in the Town of Wasaga Beach:

- a. The designer must demonstrate that the actual system velocity at peak flow will be greater than 0.4 m/s, and no greater than 3.0 m/s.
- b. The top end section of the sanitary pipe system shall have a minimum 1.0% gradient.
- c. The number of persons per unit (ppu) shall be 2.6 for all residential type units.

- d. Average daily per capita flow = 350 L/cap/day.
- e. Peak extraneous flow (I/I) = 0.28 L/ha/s for design of sanitary sewers.
- f. Peak extraneous flow = 227 L/cap/day for design of sanitary sewage pumping stations.

Where sanitary sewers must be located within an easement, the easement shall be minimum width of 6.0m, unless depth or size of sewer dictates a larger width necessary for maintenance. Additional depth of footings for houses adjacent to the sanitary sewer easement shall be considered in the design.

All private developments require an Operations and Maintenance Manual describing regular inspection and maintenance requirements, including flushing of sanitary sewers, as per Appendix E.

10.2 Material

All materials shall be CSA Certified and in accordance with the Town approved materials list as amended.

Main sewers shall be PVC, SDR 35 with rubber gasket connections and of minimum size 200 mm dia.

House service connections shall be PVC SDR 28 with rubber gasket connections and shall be 125 mm minimum dia. for single dwellings. Connections for multiple dwellings and commercial or industrial premises shall be of a type and size approved by the Town Engineer.

Forcemains shall be engineer designed and approved, and at minimum, PVC DR18 or HDPE DR11, or approved equivalent. Inside diameter of HDPE pipe must be identified on the design drawings. The PVC and HDPE pipe installation shall include a blue 12 AWG TWH solid plastic covered tracer wire, TW4 75°C 600 V or approved equal. Hydrostatic testing of forcemain for leakage shall be carried out for two-hours in accordance with OPSS.MUNI 412. Test pressure shall be 1,035 kPa (150psi), consistent with pressure testing for watermains.

10.3 Upsizing for External Lands

The Town may require a larger sanitary sewer size on parts of the development than required for the development alone, to connect to other areas or for other reasons.

10.4 Installation

Sewer construction and testing shall conform to the requirements of the Ontario Provincial Standard Drawings and Specifications for sewer construction (OPSS.MUNI 410).

New sanitary sewers shall be plugged at the point of connection to the existing sanitary sewer system throughout construction, until all sewer has been installed

and successfully passed all testing requirements. The location of the plug shall be reviewed with the Town prior to installation. The plug shall remain in place and shall not be removed until that phase of development has received the Certificate of Substantial Completion (Basic Services) from the Town Engineer.

Pipes shall be bedded in accordance with OPSD 802.010. Main sewers and house service connections across roadways shall be backfilled entirely with approved granular materials, thoroughly compacted in layers.

Shop manufactured "Tee" connections shall be used for house service connections on 200 mm and 250 mm sewers. Saddles are not permitted on 200 mm and 250 mm sewers.

Individual service connections are not permitted to connect directly into Maintenance holes.

Mainline / sewer trunk connections to Maintenance holes shall enter the Maintenance hole no higher than 600 mm above the lowest invert except as otherwise approved by the Town Engineer. Greater than 600mm requires a drop structure. Only external drop structures will be permitted.

Maximum mainline sewer pipe depth shall be 6.5m.

Maintenance holes shall be equipped with rubber gasket boots for pipe connections.

All structures to be installed complete with Denso Petroleum tape (or approved equivalent) applied at each section's joints.

Maintenance holes located in areas expected to be within areas to be flooded during the major storm event or otherwise susceptible to inflow of surface water shall be equipped with water-tight lids.

Maintenance holes shall be provided at all changes in direction of the sewer and at all street intersections, but no further apart than 150 m. Maintenance holes shall be pre-cast concrete, conforming to OPSD 701.010 and shall generally be 1200 mm dia. Larger sizes may be required depending on the size of the sewer or the number of connections in accordance with OPSD. The selection of manufacturer of pre-cast concrete Maintenance holes will be subject to the approval of the Town Engineer. Benching shall be provided in all Maintenance holes. Maintenance hole covers shall conform to OPSD 401.010 Type "A" closed cover. Covers shall be set on a minimum of 50 mm and a maximum of 150 mm of "Moduloc" or approved equivalent adjustment rings. Precast concrete adjustment units shall be installed per OPSD 704.010.

Maintenance hole steps shall be per OPSD 405.010 hollow rungs installed at 300 mm spacing with a maximum 600 mm from the top of grate to the first step.

All Maintenance holes shall be equipped with frost straps in accordance with

OPSD 701.100 installed with “quick anchors” external to the Maintenance hole in lieu of drilling through the structure.

Parging of joints within the structure is not acceptable. Section joints, as well as HDPE adjustment rings or approved equivalent shall be wrapped on the outside of each structure with Denso petroleum tape.

Maintenance holes must be initially installed such that the frame and grate is flush with base course asphalt. The frame and grate shall subsequently be raised to be flush with finished elevation and grade prior to the placement of top course asphalt. Adjustment of top of grate to match top course asphalt may be provided by cutting base asphalt around the frame and grate and raising with HDPE adjustment rings or approved equivalent adjustment ring, or by using cast iron Sigma riser rings (or approved equivalent). Alternatively, the Developer may use Bibby-Ste-Croix Autostable adjustable frames at the time of initial maintenance hole installation, which can be adjusted at the time of paving surface course asphalt.

Sanitary sewers shall be cleaned, flushed and tested for leakage and deflection in accordance with the current OPSS.MUNI 410 specifications.

The complete system shall be flushed and inspected by an approved video camera testing company and the Town Engineer shall be provided with a copy of the appropriate data.

CCTV inspection shall be undertaken per OPSD 409 as directed by the Town following the installation of all utilities. CCTV inspections are to be conducted:

- On all mainlines and service lateral connections;
- Prior to the issuance of the Certificate of Substantial Completion (Basic Services), and;
- Prior to the placement of surface course asphalt.

Any noted deficiencies shall be brought forth to the Town Engineering Department along with a detailed repair proposal by the Developer’s Engineer, along with an estimated time of repair completion prior to the placement of surface asphalt. Subsequent videos are required after repair completion.

10.5 Sanitary Sewer Services

Sanitary sewer service laterals shall be gasketed pipe, typically located minimum 1.5 m offset from the water service on the "down gradient" side (relative to the gradient of the sanitary sewer) at minimum depth of 500 mm below the water service to the lot and at a maximum depth of 2.5 m below finished grade at property line as well as a minimum depth of 1.7 m for frost protection. The service shall always be a minimum of 1.5 m offset from the side property line.

When the sanitary sewer main is 4.0m or greater in depth, the laterals shall be provided with controlled settlement joints / riser sections.

Commercial/ industrial/ institutional services shall be sized based on intended use, minimum 150 mm dia. at 2% minimum grade and inspection maintenance holes at property line.

Sanitary sewer service laterals shall be provided with a 200 mm dia. vertical PVC DR35 cleanout port brought to the surface at the property line with a PVC 125 x 125 x 200 tee. A 1.5 m length of 125 mm dia. pipe shall be extended from the tee into the private property, capped with a watertight end fitting. The service termination is to be marked with a green painted / marked 2 x 4 that extends to grade all as per the Town of Wasaga Beach Sanitary Sewer Service Connection Detail, Town Std. Dwg. No. 12.

The designer shall try to avoid locating sanitary sewer service cleanouts within the driveway wherever possible. Where necessary to locate services within a driveway / hard surface, cleanouts shall be equipped with a cast iron lid complete with flexible coupler as per Standard Drawings No. 12.

Following service installation inspection by the Building Department and prior to the final lot grading inspection, the top of the cleanout port will be adjusted by the builder to be within 150 mm of finished boulevard grade adjacent to property line and shall be capped with a detectable metal cap.

10.6 Miscellaneous

The Town shall not be held responsible for any costs arising out of the construction of sanitary sewers for the development.

Upon completion of the work, and prior to the issuance of Building Permits, Sanitary Sewer Record Sheets shall be provided in a form similar to the water service requirements in Section 9.8.

All sewers and Maintenance holes must be inspected and flushed prior to Municipal assumption and in accordance with Appendix B of these Standards.

11. SANITARY SEWAGE PUMPING STATIONS

11.1 General

1. There are four major types of sewage pumping stations that the designer may consider for site specific conditions: submersible, wet well/dry well, suction lift and screw pump.
2. The following are the standard specifications for submersible sanitary sewage pumping stations (submersible pumps located in the same below-grade chamber into which the wastewater flows) to be installed and connected to the Town of Wasaga Beach sanitary sewer collection system.

3. For the elements in common these standards also apply to all types of sewage pumping station; however additional standards referencing Special Considerations for the other types of sewage pumping station in the current MOE guidelines also apply to those types of pumping stations.

4. In addition to the standards included here, all sewage pumping stations must be designed in accordance with current MOE guidelines.

5. Submersible sanitary sewage pumping stations shall consist of a wet well, sewage pumps, control systems, electrical systems (normal and emergency), superstructures, site security, grading and access.

6. The developer shall be responsible for extending all necessary utilities to the pump station site (water, electrical, gas, phone, etc.).

7. The design of a pumping station requires a review of the components of the system to ensure that the system is safe to operate, with access ladders, hoists for lifting pumps, lighting, ventilation to remove dangerous gases and security for the electrical system being among the major safety items to be considered.

11.2 Station Capacity

1. Sewage pumping stations shall be able to pump the design peak instantaneous sewage flows and be capable of upgrading to handle future peak flows from the ultimate tributary area with minor modifications (e.g. pumps, motors or impeller changes).

11.3 Feasibility and Site Considerations

1. Sanitary sewage pumping stations shall only be considered when gravity collection and disposal of sewage is ruled out as impractical. The following shall also be reviewed when considering the site location of a sewage pumping station:

- The structures, electrical and mechanical equipment shall be protected from physical damage by the 100-year design flood event. Sewage pumping stations shall remain fully operational and accessible during the 100-year flood event. Regulations/requirements of municipalities, provincial and federal agencies regarding flood plain obstructions must be considered.
- The pumping station shall be readily accessible by maintenance vehicles during all weather conditions, be located off the traffic way of streets, have access hatches with locks and have security fencing.
- Geotechnical review and attendant impacts on feasibility (e.g. rock or high water table).

- Natural and other aesthetic features at the site and consequent station structural, architectural and landscaping design so as not to detract from the surrounding area.
- Odour impacts, mitigation and control.
- Noise impacts, mitigation and control.

11.4 Design Report

1. All sewage pumping station plan submissions shall include a Design Report with the following information:

- Title Page which includes subdivision name, Legal Description and/or Municipal Address, date, developer/owner's name and engineering firm preparing the plans.
- Sewer System Information as follows:
 - Introduction
 - Type, location and size of development
 - Number of and range in size of lots to be developed
 - Existing Sewer System
 - Location and type of gravity system the force main will discharge into
 - State whether the entire development will be serviced by the proposed phase or if several phases will be involved
 - State the number of lots this phase will encompass initially and finally if future phases are to be constructed
- Listing of results from the design calculations to be provided in the following order:
 - Number of lots or buildings
 - Population equivalent
 - Average daily flow (ADF) in L/s
 - Peak flow (PF) in L/s
 - Volume of the wet well
 - Static head
 - Total dynamic head
 - Submersible pump selections (manufacturer, model number, size, kW, RPM, phase and capacity)
 - Total cycle time for ADF (fill time plus pumping time)
 - Total cycle time for PF (fill time plus pumping time)
 - Size and length of force main
 - Velocity maintained in force main
 - Force main retention time (at initial and design flows)
 - Maximum force main operating pressure
- Cost Analysis

- Consultant shall complete a cost analysis of the construction, operation, maintenance and life cycle costs over a 50-year period. These costs shall be compared with a gravity sewer alternative. Operations and maintenance costs include labour, electrical, equipment replacement, building, operation and routine maintenance.
- The gravity sewer cost comparison is not necessary if the gravity sewer alternative would include sewer installed at depths greater than 6.5 metres.
- Pump information including pump performance curves, make and model.
- Leakage testing specifications including testing methods and leakage limits.

11.5 Structures

1. Where more than one sewer enters the site, a junction maintenance hole shall be provided to allow for one inlet into the wet well.
2. Where a bar rack is required, preceding the pumps, a mechanical hoist must be provided and mechanical cleaning of the bar rack is required (bar rack generally not required for submersible pumping stations).
3. Dry wells, including their superstructure, shall be completely separated from the wet well and common walls must be gas tight.
4. Safe access for persons wearing self-contained breathing apparatus shall be provided.
5. Screens and other equipment located more than 1.2 metres deep in wet wells shall be provided with stairway access.
6. Wet wells greater than 5.0 metres deep shall be provided with safety platforms.
7. All stairways and walkways shall be properly designed with guardrails.
8. Confined spaces shall be minimized.

11.6 Submersible Pumps

1. Pumps and motors shall be designed specifically for raw sewage use. Pumps shall be manufactured by Flygt or as approved by the Town.
2. Pump selection shall take into account the availability of local repair service, as well as the manufacturer's experience and history in the design and selection of pumps for raw sewage use.

3. Pump removal shall include an engineered hoist and pumps shall be readily removable and replaceable without personnel entering or dewatering the wet well, or disconnecting any piping in the wet well and without interfering with the continued operation of the remaining pumps.

4. Multiple pumps shall be provided. Where only two pumps are provided, they shall be the same size. The pumps shall be capable of providing a firm capacity with the largest pump out-of-service equal to the design peak hourly flow.

5. The designer must ensure that all pumps are subjected to hydrostatic and operating tests performed by the manufacturer.

6. Pump impellers shall be of non-clog design and capable of passing spherical solids of up to 80 mm in diameter.

7. Pump suction and discharge openings shall be a minimum 100 mm in diameter.

8. Each pump shall be equipped with flush valves for aeration and suspension of grit and solids in the wet well; alternatively recirculation pipes or mixers shall be provided.

9. Each pump shall be equipped with a time totalizer and provision for automatic or manual alteration of the lead pump.

10. Pumping station designs shall be based on system-head calculations and curves for three conditions using Hazen-Williams factor "C" as follows:

a) Low sewage level in the wet well, $C = 120$

b) Median sewage level over the normal operating range in the wet well, $C = 130$

c) Overflow sewage level in the wet well, $C = 140$

11. System-head curve (b) (normal operating range) shall be used to select the pump and motor; the pumps shall be able to operate satisfactorily over the full range (intersections of system-head curves (a) and (c) with the selected pump curve).

12. Pumping stations discharging directly to a sewage treatment plant or another pumping station shall be equipped with variable speed drives.

11.7 Wet Wells

1. Divided wet wells, properly interconnected to facilitate repairs and cleaning, shall be provided for all pumping stations with firm capacities in excess of 100 L/s and in smaller stations where continuity of operation is critical.

2. Wet wells are to be of adequate size to suit equipment space, operator access requirements and active volume considerations.

3. To minimize dead storage volume, the depth from the “pump off” level to the floor of the wet well shall be kept to the minimum recommended by the pump manufacturer.

4. Wet wells must be small enough to minimize the total retention time (time sewage is held in the wet well and any rising force main) while also large enough to control the frequency of pump starts, as follows:

- Maximum retention time in the wet well should not exceed 30 minutes for the design average daily flow rate (unless the station is designed to provide flow equalization).
- Total retention time in the wet well and force main shall be kept to a minimum (generally less than 4 hours) to avoid anaerobic fermentation and the resultant production of odorous, hazardous and corrosive gases (alternatively, provisions must be made to control anaerobic conditions).
- For pumping stations with 50 kW or smaller pumps, the wet well shall be large enough to limit the cycle time to no less than 10 minutes for each pump; for larger pumps, the pump manufacturer’s duty cycle recommendations shall be utilized in selecting the minimum cycle times.

5. Other factors that shall be considered in wet well sizing include dimensional requirements to avoid turbulence problems, vertical separation between pump and control points, sewer inlet elevation, capacity required between alarm levels and basement flooding and/or overflow elevations, and the number of and horizontal spacing between pumps.

6. The minimum surface plan area of a wet well shall be 4.9 square meters.

7. Equipment such as access hatches, ladders, service platforms, guards, grates and handrails shall be constructed of a suitable material when exposed to wet and/or corrosive conditions.

8. Wet wells shall be arranged and benched (minimum 1:1 sloped wet well floor to hopper type bottom) to limit dead spaces where solids can accumulate and to provide smooth, unobstructed flow to the pump suction influence zones, with the horizontal area of the bottom being no larger than necessary for the proper installation of the pump.

9. The cross-sectional area of the wet well above the benching shall be constant for the full depth of the wet well.

10. Access to the wet well shall always be from the outside, with an access ladder provided from the top of the slab to the service platform and a separated ladder from the platform to the bottom of the well.
11. The opening to the wet well (minimum 750 mm x 900 mm, or 900 mm diameter) shall be provided with a cover with a lock and pry lip and safety rail around the access, shall be flush with the vertical wall of the wet well and shall be on the wall giving access to float controls, bubbler lines and similar equipment, without the necessity of entering the wet well.
12. All bolts, nuts, other fasteners and piping used in the wet well areas, including platform, chain and pump lifting chain, shall be stainless steel.
13. All supports, brackets, gratings, ladders and other structures shall be of corrosion resistant materials.
14. All-aluminum doors or hatches are required for access to the wet wells.
15. All wet wells to be equipped with DBI SALA fall arrest pockets for confined space entry.

11.8 Valve Chambers or Dry Wells

1. Required valves shall be located in a separate valve chamber or a dry well, with provisions for draining accumulated water from the chamber or dry well.
2. Check valves that are integral to the pump and can be removed from the wet well need not be located in a separate structure.
3. Valve chambers may be dewatered to the wet well through a drain line with a gas and water tight valve.
4. Dry well floors shall be sloped toward a sump, equipped with a sump pump.
5. A sump pump equipped with dual check valves shall be provided in the dry well to remove leakage or drainage with discharge above the high water level of the wet well.
6. Pump seal leakage shall be piped or channeled directly to the sump and the sump pump shall be sized to remove the maximum pump seal water discharge that would occur in the event of a pump seal failure.

7. The air bubbler line (if used) and sump pump discharge shall cross between the dry well and wet well below the frost line. All openings between the dry well and wet well shall be sealed to prevent gases from entering the dry well.

8. The capacity of any water service must not exceed the sump pump capacity and any water service provided to the dry well shall be equipped with a suitable backflow preventer.

9. Suitable access and lifting/moving equipment shall be provided for the maintenance/ repair/removal of sump pumps, valves, fittings, etc. located in the dry well.

10. All dry wells to be equipped with DBI SALA fall arrest pockets for confined space entry.

11.9 Piping and Valves

1. Shutoff and check valves shall be placed on the discharge line of each pump, with the check valve preferably placed horizontally between the shutoff valve and the pump.

2. Shutoff and check valves shall be capable of withstanding normal pressure and high-pressure transients and shall be operable from the floor level and accessible for maintenance (outside levers shall be provided on swing check valves).

3. Pump discharge piping shall be a minimum of 100 mm diameter and designed with the following features:

- Velocities at design peak flows in the 0.8 to 4.0 m/s ranges (preferably in the low end of the range)
- Flanged, concentric increaser
- Spacer 150 to 300 mm long with one flanged end and one grooved end for Victaulic coupling
- Elbows (as necessary)
- Flanged check valve
- Flanged gate valve
- Riser pipe
- Magnetic or other type of suitable flow meter and recorder (or pump times for small, constant speed stations where accuracy or flow measurement is not critical – 3 timers minimum, one for each pump and one for pumps operating in parallel).

- 150mm bypass pipe and valves located downstream of meters and control valves.
4. Flow meters shall be provided by Endress & Hauser, or other approved by the Town.

11.10 Ventilation

1. All wet wells and dry wells shall be properly ventilated, with no interconnection between the wet well and dry well ventilation system and no venting of wet well air into a building.
2. Ventilation, heating and dehumidification equipment shall be provided to protect electrical control equipment from excessive moisture.
3. Wet well ventilation may be either continuous or intermittent, with continuous ventilation providing at least 12 air changes per hour and intermittent ventilation providing at least 30 air changes per hour, based on 100 per cent fresh air.
4. Natural ventilation of small pumping station wet wells is acceptable, utilizing two 100 mm diameter vent pipes with gooseneck tops and insect screens, extending 900 mm above the slab of the wet well (with one vent extending within 0.3 m of the crown of the inlet sewer and the other terminating on the underside of the roof slab).
5. Where a wet well ventilating fan is provided the air change requirements shall be oriented to blow fresh air into the wet well at a point 900 mm above the alarm level.
6. Dry well ventilation may be either continuous or intermittent, with continuous ventilation providing at least 6 air changes per hour and intermittent ventilation providing at least 30 air changes per hour, based on 100 per cent fresh air.
7. Mechanical ventilation of dry wells in accordance with Ministry of Labour requirements must be provided.
8. In dry wells over 4.6 m deep, multiple inlets and outlets shall be provided, fine screens or other obstructions shall be avoided and dampers shall not be used on exhaust or fresh air ducts.

11.11 Electrical

1. Submersible pumps shall operate at 3 phase power.

2. Pump motors shall be equipped with soft starter and across-the-line starter option with pilot lights (run, fault), hour meters, amp meter and HOA switch.
3. Pumps shall have plug and receptacle on flexible cable with serviceability under conditions of extra hard usage and shall meet the requirements of the Ontario Electrical Safety Code standards for flexible cords in sewage pumping stations.
4. All flexible cable shall be provided with corrosion-resistant terminal fittings, watertight seal and separate strain relief, and shall be designed to facilitate field connecting.
5. Electrical supply, control and alarm circuits shall be designed to provide strain relief and to allow disconnection from outside the wet well, with terminals and connectors protected from corrosion by location outside the wet well or through use of watertight seals.
6. The motor control centre shall be located outside the wet well, be readily accessible and be protected by a conduit seal or other appropriate measures meeting the requirements of the Ontario Electrical Safety Code, to prevent the atmosphere of the wet well from gaining access to the control centre, with the seal located such that the motor can be removed and electrically disconnected without disturbing the seal.
7. When exposed to weather the motor control centre shall meet the requirements of weatherproof equipment of the National Electrical Manufacturers' Association (NEMA) 3R or 4.
8. Electrical systems and components (e.g. motors, lights, cables, conduits, switch boxes, control circuits) in raw sewage wet wells, or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapours may be present, shall comply with the Electrical Safety Code (O. Reg. 164/99) under the Electricity Act, 1998 for Zone 1, Group D locations.
9. Installation of electrical equipment and wiring located within the wet well shall be avoided unless it is essential that it be located in the wet well. All junction boxes shall be installed outside the wet well and all wire access holes shall be sealed to prevent migration of gases through the wet well walls.
10. Equipment located in the wet well shall be suitable for use under corrosive conditions.

11. A fused disconnect switch located above ground shall be provided for the main power feed for the pumping station which, if exposed to weather, shall meet the requirements of weatherproof equipment NEMA 3R or 4.
12. Lightning and surge protection shall be included.
13. A 110-volt power receptacle shall be provided inside the control panel for stations that have control panels located outdoors.
14. Ground Fault Circuit Interruption (GFCI) protection shall be provided for all outdoor outlets and for indoor outlets located near eye washes or other area susceptible to dampness.
15. Interior and exterior lighting to be LED

11.12 Mehcanical

1. Frost free hose-bib located at exterior near wet well hatches.
2. Sink, hot water tank and eyewash station.

11.13 Controls and Alarms

1. Instrumentation and control systems must be designed to the satisfaction of the Town. The method of communication is to be determined in consultation with the Town.
2. A flood alarm shall be supplied in any dry well.
3. Supervisory Control and Data Acquisition (SCADA) shall consist of an integrated hardware and software system to provide full control and monitoring of the pumping station, with the pumping station designed for manual configuration and then automated with SCADA.
4. Level control shall be provided by Siemens Sitrans P pressure measurement system or as approved by the Town. Float backup shall be provided for high level alarm.
5. Level control sensing devices shall be so located as not to be affected by turbulent flows entering the well or by the turbulent suction of the pumps.
6. Float controls shall be at least 300 mm vertically and 450 mm horizontally apart and positioned against a wall away from turbulent areas.

7. High sewage level should normally be at least 300 mm below the invert of the inlet sewer, however where there is no danger of basement flooding and/or solids deposition, normal high sewage level may be designed to be above the invert of the inlet sewers to minimize pumping costs and wet well depth.
8. Low sewage level should be at least 300 mm or twice the pump suction diameter (D) above the centre line of the pump volute.
9. The bottom of the wet well shall be no more than $D/2$ and no less than $D/3$ below the mouth of the flared intake elbow.
10. Provision shall be made to automatically alternate the pumps in use.
11. Flow monitoring and data logging shall be accomplished with a magnetic flow meter.
12. Alarm systems with standby power source are required for all pumping stations.
13. The alarm shall be activated in cases of power failure, dry well sump and wet well high/low water levels, pump failure, unauthorized entry, high/low temperature, air quality (H_2S , CO , O_2 and Flammable), generator fault/failure to run, transfer switch, utility power fail, level transducer fault or any other cause of pump station malfunction.
14. Pumping station alarms shall include identification of the alarm condition and shall be transmitted to the Wasaga Beach Water Pollution Control Plant.

11.14 Standby Power

1. All sewage pumping stations must be provided with an automatic generator for standby power in case of power failure (for small pumping stations, a quick connection for a portable generator may be considered by the Town). Both diesel and natural gas fired generators shall be considered. The capital/operating costs and reliability of both options shall be reviewed with the Town before making a final selection.
2. Standby generators shall be sized to provide adequate power to start and continuously operate all connected loads, including pumps, lighting, ventilation and other auxiliary equipment necessary for the safe and proper operation of the sewage pumping station.
3. The generating equipment shall be capable of operating all pumps during emergency situations, however operation of fewer pumps during auxiliary power supply will be considered if an evaluation based on design peak hourly flows,

anticipated length of power outage and storage capacity indicates such operation is justified.

4. Unless the generating equipment has capacity to start all pumps simultaneously with auxiliary equipment operating, special sequencing controls shall be provided to start pump motors.

5. Where permanent standby generating equipment is provided, the standby generating equipment shall include automatic (i.e. automatic transfer switch) and manual start-up and load transfer.

6. Where a connection for portable generating equipment or manual transfer is provided, sufficient storage capacity with alarm system shall be provided to allow time (minimum 2 hours) for detection of the pumping station failure and time to transfer, setup and connect portable equipment.

11.15 Emergency High Level Overflow

1. A controlled, high-level wet well overflow to supplement alarm systems and emergency power generation shall be provided, where possible.

2. Where such overflows are proposed, MOE shall be contacted to assess the potential impact on public water supplies or other critical water uses and determine the necessary treatment and storage requirements.

3. Storage/detention tanks or basins, if provided, shall be made to drain to the pumping station wet well.

11.16 Commissioning

1. Commissioning testing of sewage pumping stations, including but not necessarily limited to the following, shall be completed and shall be certified by a Professional Engineer:

- Testing of station performance over the full range of flows, including transitions between pumps.
- Pump performance test demonstrating the pumping efficiency, capacity and function in accordance with the pumping station design report.
- Continuous high frequency (minimum 1 Hz) pressure monitoring during testing procedure and for 24 hour period under normal conditions using portable equipment.

2. Reporting on commissioning results complete with plots of pressure and flow during the testing procedure and all relevant interpretation and explanations, including discussion of impact of operations and life cycle costs.
3. Operation and Maintenance Manuals provided to the Town and/or Operating Authority.

11.17 Assumption

1. The Owner shall maintain the facility and provide maintenance reports on an annual basis (based on monthly inspections) until assumption of the facility by the Town.
2. The Town will not assume the facility until a minimum of 80% of the dwelling units are occupied and until such time as the Town is prepared to assume all other municipal aspects of the subdivision. It should be clearly detailed that the developer shall be fully responsible for the full 100% cost to operate the sewage pump station (including OCWA and Town costs) until the facility is assumed by the Town.
3. Prior to the pumping station assumption by the Town the following shall be required:
 - Engineering certification in relation to the overall pumping station construction and performance in writing, signed and stamped by a Professional Engineer.
 - As-constructed drawings, 3 copies of operation and maintenance manuals (to have been provided prior to commissioning), the original design report and approved shop drawings for all equipment, prior to final inspection.
 - Copy of close-out permit from ESA.
 - Installation test reports of feeders, pumps, etc.
 - I/O point-to-point checklists.
 - All schematic drawings and manuals.
 - Documentation for load bank testing of generator set, including oil sample testing report.
 - Confirmation that “Normal” and “Emergency” power is in phase and demonstration of the generator set operation from Normal to Emergency and back to Normal mode, proving louvre operation.
 - Engineering certification that pump rotations are correct.
 - All electrical enclosures shall be clean and operational.
 - Confirmation of capacitor sizing versus pump motor sizing and power factor testing with and without load (if applicable).
 - Demonstration that alarms function locally and remotely.

- Demonstration of a complete pump cycle, including alternation of pumps as well as initiating a pump failure to prove lag pump backup operation.
- Pump servicing reports.
- Spare parts and warranties information package.
- 11" x 17" plastic laminate fact sheet on the pumping station including lowest basement elevation, location of force main outlet to gravity system and bypass invert elevation, mounted adjacent to the control panel.
- 11" x 17" plastic laminate with process flow diagram indicating valves and key interlocks.
- Generator fuel system 3rd party TSSA inspection report.

12. STORMWATER MANAGEMENT

12.1 General

Stormwater quantity and quality must be satisfactorily addressed on all projects.

The design requirements of the Town of Wasaga Beach, Ministry of the Environment and Climate Change and Nottawasaga Valley Conservation Authority and any other applicable agencies will apply.

Design and system selection must comply with the Ministry of the Environment Storm Water Management, Planning and Design Manual (latest edition).

Generally, stormwater run-off shall be accommodated by a system of catch basins, Maintenance holes and storm sewers. The storm drainage system is to be designed to limit flood damage and hazards for non-frequent storm conditions, to provide a reasonable level of convenience and safety for pedestrian and traffic use by removal of lot and street surface run-off during frequent storm conditions and to prevent the impairment of water quality and disturbance to natural streams.

In all cases the designer must have regard for impacts on receiving watercourses, riverfront and public beach areas.

The developer's design engineers are encouraged to consider use of low impact development (LID) techniques for stormwater management in lieu of and/or in combination with end-of-pipe designs where reasonable / feasible. LID measures will be considered by the Town in consultation with the Nottawasaga Valley Conservation Authority on a case-by-case basis, particularly with regard to the downstream receiving Town owned property capacity to convey stormwater flows in the event of LID measures failing. Measures to be considered shall include but not be limited to underground pipe storage, infiltration galleries, low gradient grassed infiltration swales, bio-retention swales, rain gardens, permeable pavers / surfaces and/or other industry standard / acceptable means of lot level control for stormwater quantity and quality. The designer should review the NVCA Stormwater Technical Guide for LID design considerations.

An Operations & Maintenance Manual for all Stormwater Management facilities shall be provided under separate cover, as outlined in Appendix E, complete with a Stormwater Management Facility Specifications Summary, as outlined in Appendix D.

12.2 Service Areas

The system shall be designed to service all areas within the subdivision to their maximum future development in accordance with the Official Plan. Allowance shall be made for inflows from the appropriate adjacent drainage areas and outlets to the appropriate adjacent sewer or watercourse. This may require assumptions to be made for post development conditions of adjacent future development lands that outlet to the stormwater management facilities. The exact location and service requirements for connecting sewers or channels to adjacent sewers or areas shall be approved by the Town Engineer.

12.3 Materials

All materials shall be CSA certified and supplied in accordance with specifications and the Town approved materials list.

12.4 Drainage Easements/ Blocks

If the required drainage works from municipal lands or lands to be dedicated to the municipality result in drainage through other lands, all such work shall be carried out by means of a storm drain and appurtenances of sufficient size for the drainage requirements of the area. The design shall be based on the run-off to be expected from the area when completely developed with buildings, pavements, sidewalks and parking areas, and such design shall be approved by the Town Engineer.

The Developer will obtain at no expense to the Town by deed or grant of easement in a form approved by the Town Solicitor, any necessary rights in land for drainage through lands other than its own. The Town shall be protected or indemnified by the Developer from all claims or actions of any nature or kind whatsoever arising from the use of such lands until such time as the services installed therein become vested in the Town in the manner herein before provided.

Lands designed as overland flow routes, drainage corridors, or spillways shall be deeded to the Town as municipal blocks. These drainage blocks must be designed to convey the 100-year return frequency storm event and may be required to accommodate the Regional (Timmins) Storm event. The minimum width of these blocks is 6.0 metres. The design of drainage blocks must be verified using HEC-RAS software or approved equivalent.

To ensure the integrity of rear yard drainage and overland flow systems, 3.0 m wide drainage easements may be required over the rear of all lots, and where

possible, split equally on either side of the adjoining lots.

An Overall Comprehensive Plan of Easements is required with design submissions.

12.5 Stormwater Management Report

The Stormwater Management Report setting out the existing and proposed drainage system shall be submitted for approval to the Town Engineer. The report may also have to be approved by the Ministry of the Environment and Climate Change, the Ministry of Natural Resources and Forestry, and the Nottawasaga Valley Conservation Authority. This report shall provide for all criteria within this section of the Engineering Standards and among other things shall pay particular attention to the following:

- (a) Possible areas within the subdivision not having suitable drainage outlets as well as proposed mitigation measures to ensure that a suitable outlet is provided for each area.
- (b) The possible obstruction of natural drainage patterns caused by development and buildings, and proposed mitigation measures as necessary.
- (c) Details of a suitable drainage outlet(s) from the subdivision.
- (d) Natural watercourses entering the subdivision and adjacent lands draining to the subdivision and protective measures incorporated into the design to preserve these features.
- (e) Accumulated flows at all proposed drainage structures.

The report shall include a plan showing the major overland system design. When the Rational Method is used, the relevant figures are to be entered on Storm Sewer Design Sheets, which are to be included as part of the drawing set in the detailed drawings submissions. When computer modelling is used, the report shall indicate model parameters and assumptions used to give outflow hydrographs and hydraulic grade line levels (for 100-year storm event) on plan / profile drawings where applicable.

This report shall provide recommendations for dealing with all drainage that affects the design of drainage works for the development and such recommendations, when approved by the Town Engineer shall be incorporated into the detailed Engineering Design Drawings.

12.6 Design Flows

Potential increases in run-off rates resulting from new development shall be controlled as required by the Town. Where downstream constraints exist such as those established by the Town or the Nottawasaga Valley Conservation

Authority, the drainage report shall demonstrate how run-off rates will be controlled to satisfy those constraints. In the absence of such constraints, the post-development flows from a 5-year return frequency storm shall not exceed the flows for pre-development conditions for the same storm at the outlet for the minor system unless it is demonstrated to the satisfaction of the Town Engineer and Nottawasaga Valley Conservation Authority (as applicable) that uncontrolled flows will have no adverse effects. Similarly, for the major system, post-development run-off from a 100-year return frequency storm shall not exceed the pre-development run-off for the same storm.

The designer must also demonstrate that the Regional (Timmins) Storm event can be safely conveyed to a positive outlet via overland flow routes including drainage blocks and/or municipal rights-of-way.

12.7 **Methods of Computation**

Pre-development peak flows shall be computed by a method such as the Rational Method or by an approved equivalent or more conservative computer model. Watershed definition and pre-development flows must be approved by the Town Engineer.

Preliminary estimates of post-development flow rates may be computed using a method such as the Rational Method.

For all systems and for the design of surcharged sewers and detention facilities, the latest version of the computer model SWMHYMO or OTTHYMO is recommended. Other hydrograph methods may be considered if it is demonstrated that the results are comparable to those from OTTHYMO. Post-development design flows may be determined using the Rational Method only where the design area is less than 40 hectares and run-off control facilities are not considered.

The Rational Method and the Town's intensity-duration-frequency (IDF) regression equation for rainfall intensities are to be used for storm sewer pipe sizing calculations, which must be approved by the Town Engineer. All storm sewers shall be designed according to the Rational Formula:

$$Q = \frac{CiA}{360}$$

where,

Q	=	design flow in (m ³ /s)
C	=	site specific runoff coefficient (unitless)
A	=	drainage area (ha)
i	=	rainfall intensity (mm/hr)

The rainfall intensity shall be calculated in accordance with the following:

Town of Wasaga Beach IDF Curve Parameters – Adjusted for Climate Change

Parameter	Return Period					
	1:2 Year	1:5 Year	1:10 Year	1:25 Year	1:50 Year	1:100 Year
A	586	765	901	1084	1171	1263
B	2.58	2.44	2.54	2.74	2.49	2.33
C	0.742	0.739	0.741	0.746	0.741	0.737

1. Rainfall Intensity, i (mm/hr) = $a/(t_c+b)^c$, where t_c is time of concentration in minutes.
2. Parameters based on MTO IDF Curve Look-up Tool 2010 base data (Latitude – 44.520833, Longitude -80.012500).
3. Climate change adjustment based on a review of literature, the IDF intensity values were increased by 20% to account for climate change.

$$i = \frac{a}{(t_c+b)^c}$$

where,

- i = rainfall intensity (mm/hr)
- t_c = time of concentration (minutes)
- a, b, c = a function of the local intensity duration data (adjusted for climate change)

Where the first leg of a residential storm sewer system is sized using the Rational Method, the initial inlet time shall be 15 minutes for the 5-year storm. This shall apply where the upstream drainage area does not include large open space areas, in which case the inlet time of concentration is to be calculated in accordance with the Ministry of Transportation Drainage Manual. Where peak flows from external areas enter a subdivision sewer system, the more critical case based on either the time of concentration including the external area, or the time of concentration excluding the external area shall be used. Actual velocities of computed peak flows shall be used to estimate time of concentration.

A design evaluation of inlet times must be submitted to justify inlet times different from those specified above, especially in the cases where the sewer is designed for certain surcharge conditions for larger storms and where the sizing is optimized for both situations. Such an evaluation should be approved by the Town Engineer prior to submission of design drawings.

Run-off coefficients for the Rational Method are given by component of surface treatment and by Land Use. The Land Use values provided are intended as a guide only. The designer is encouraged to develop an appropriate coefficient using a composite calculation, which is subject to the approval of the Town Engineer.

Description	Runoff Coefficient 'C'
Sodded area under 7% slope	0.25
Sodded area over 7% slope	0.35
Paved Area with Storm Sewer	0.90
Paved Area with Sodded Swales (Dependent on Relative Area of Swale To Paved Area and On Type of Swale)	0.30 - 0.85
Gravel Area	0.75
Roof Area	0.90
Flat Roof Area With Detention Hoppers	0.10 - 0.50
Residential Lots:	
Single Family	0.30 – 0.45
Semi-detached	0.45 – 0.60
Row / townhouses	0.50 – 0.70
Commercial / non-residential Lots With Roof Leaders Or Pavement to Sodded Areas	0.40 - 0.85
Unimproved Open Space Under 7% Slope	0.25
Unimproved Open Space Over 7% Slope	0.30

In addition to the above parameters, when developing a “weighted ‘C’ value”, the designer shall consider the allowable percent imperviousness as outlined in the Town’s Zoning By-law. The following is a summary of the maximum allowable imperviousness at full build-out of all lots under each type of zoning:

Zone	Lot Coverage (max.)	Landscaped Open Space (min.)	Maximum impervious build-out
R1	35%	30%	70%
R2	40%	30%	70%
R3	35-45% (per unit type)	30%	70%
R4	35%	35%	65%
CD	(none)	5%	95%
CS	(none)	10%	90%
CL	40%	(none)	100%
CR	(none)	20%	80%
CT	(none)	(none)	100%
CA	(none)	10-35%	65-90%

For estimating flows from storms larger than the 5-year return storm the run-off coefficients should be increased to account for the increase in run-off due to saturation of the soil, with the estimate becoming less accurate for larger storms. Coefficient for the larger storms can be derived as follows:

$$\begin{aligned}C_{10} &= C_5 \\C_{25} &= C_5 \times 1.1 \\C_{50} &= C_5 \times 1.2 \\C_{100} &= C_5 \times 1.25\end{aligned}$$

Manning's Formula shall be used to determine the capacity of the sewers. For concrete and PVC sewers, a roughness coefficient of 0.013 shall be used. For corrugated pipe used as culverts, not storm sewers, roughness coefficient of 0.024 shall be used.

In general, a storm sewer system shall be designed to convey not less than the 5-year return frequency storm without surcharge. Where underground storage is proposed, a hydraulic grade line analysis of the storm sewer system under 1 in 100-year storm condition is required. The hydraulic grade line shall be shown on a profile drawing in the Storm Water Management Report and on Final plan / profile drawings. Surcharged design may be considered for higher design levels where suitable methods are used, subject to the approval of the Town Engineer.

12.8 Minor Storm System

Storm sewers and culverts are to be designed for at least a 5-year return frequency storm without surcharge where adequate overland drainage capacity exists to satisfy the major system requirements.

An exception to this may be considered when the major system is inadequate either because there is no outlet for overland flows or there is insufficient surface detention potential. Under these circumstances and subject to approval by the Town Engineer, the sewer system may be designed to carry as much flow as necessary to achieve the minimum 100-year level of protection for the major system as specified below.

12.9 Major Storm System

Run-off rates in excess of the design capacity of the minor system shall be conveyed via streets and swales to a safe outlet. The combination of overland flow system and minor system shall be designed for a minimum 100-year return frequency storm, to prevent flooding of private property with maximum level of road flooding and surface detention as follows:

LOCATION	STORM RETURN FREQUENCY (YEARS)		
	Under 25	25	100
Walkways and Open Spaces	Minor Surface Flow UP to 25mm Deep On Walkways	As Required for Overland Flow Outlets	As Required for Overland Flow Outlets
Collector and Industrial Roads	Within the Roadside Ditch or 1.0 m Wide in Gutter or 0.10 m Deep at Low Point Catch Basins	Up to Crown	0.10 m Above Crown
Arterial Roads	Within the Roadside Ditch or 1.0 m Wide in Gutter or 0.10 m Deep at Low Point Catch Basins	One Lane Clear	Up to Crown
Public Property	Minor Ponding in Swales or Ditches	No Structural Damage, Ponding in Flat Areas, No Erosion	No Structural Damage, Ponding in Flat Areas, Some Erosion
Private Property	Minor Ponding In Swales	No Structural Damage, Ponding In Yard Areas	No Structural Damage, Ponding in Yard Areas Below Building Openings - No Basement Flooding
Parking Lots	No Surface Ponding for 5-year return frequency or less	No structural damage, Max. Ponding depth 200 mm	No Structural Damage, Max. Ponding depth 200 mm.

Street grading must provide a continuous gradient to direct street flows within the right-of-way to a safe outlet at low points. Outlets can be walkways or open sections of roadways leading to parks, open spaces or river valleys.

12.10 Outfalls

Outfall structures to existing channels or watercourses shall be designed to minimize potential erosion or damage in the vicinity of the outfall from maximum design flows.

12.11 Stormwater Quantity Control

12.11.1 General

Where deemed necessary by the Town to reduce run-off increases and to meet identified downstream flow constraints, detention and/or retention facilities shall be provided for both the major and minor systems.

Land area set aside expressly for stormwater management facilities where it is not part of a privately owned facility (i.e. roof top storage or otherwise incorporated into industrial/commercial lands) shall be designated as a "stormwater detention/retention site".

All detention/retention facilities dedicated by the Developer to the Town shall not be considered as part of the park system.

All stormwater management facilities shall be provided with an outlet (overflow spillway) designed to accommodate a 100-year return frequency storm and/or the Regional (Timmins) storm event flow without failure. Suitable erosion protection shall be provided downstream of the outlet for all flow conditions. Operation during spring snowmelt or freezing conditions shall be investigated and any required changes shall be incorporated.

For private commercial developments, surface water infiltration systems are encouraged, utilizing existing granular soils conditions and having regard for seasonal high groundwater table.

12.11.2 Parking Lot Storage and Rooftop Storage (Commercial Development)

The Town does not recommend the use of rooftop storage for stormwater management. Continual functioning of flow control devices cannot be guaranteed and therefore, these methods of quantity control create a potential for flood damage. Where other options for stormwater management practices exist, it is the preference of the Town that alternatives to rooftop storage be used.

Rooftop storage will not be considered for any residential building including mixed residential / commercial use.

In the event that the Developer proposes rooftop and/or parking lot storage due to site conditions / restrictions, the following conditions shall apply:

1. The Developer must provide written acknowledgement that he is aware of the potential liabilities associated with parking lot and rooftop controls, and that the Municipality will not be held liable for any damages related to the installation, operation, modification or removal of proposed parking lot or rooftop controls.
2. Parking lot and rooftop storage systems must be registered on title to be binding on subsequent site owners as part of the Site Plan Agreement to ensure they cannot be removed or altered during future site alterations

without the provision of adequate alternative storage, as approved by the Municipality.

Design Requirements for Parking Lot Storage

- Parking lot storage must be controlled by pipe size reductions within the storm sewer network, and preferably not through the use of orifice plate restrictors.
- Surface ponding is only allowable during storm events greater than the 1:5 year design storm. No ponding may occur for lesser storm events.
- The maximum allowable ponding depth within the parking lot is to be limited to 200 mm.
- The 100-year ponding elevation and storage volume provided at each ponding location must be shown on the Site Grading and Drainage Plan.
- No ponding is permitted within designated fire routes.

Design Requirements for Rooftop Storage

Where rooftop controls are considered, design submissions must indicate:

- the type of control to be installed (i.e., product name and manufacturer), complete with tamper-proof screening.
- the number and placement of proposed drains and weirs;
- product specifications showing design release rates for each structure;
- the maximum ponding depth of 150mm, draw down time and detained volume at each structure; and the total release rate and detained volume for the roof.
- An emergency weir overflow be provided at the maximum design water elevation
- As part of the design submission, the engineer may also be requested to demonstrate that there is sufficient distance from the outlet structure to the closest watercourse such that the discharged flows will not adversely affect the temperature of the watercourse.

12.11.3 Underground Storage

The use of underground storage for stormwater management will be considered by the Town subject to the results and recommendations of a geotechnical investigation. For underground storage systems incorporating infiltration measures into the design, in-situ infiltration testing confirming the infiltration rate

of the native soil is adequate is to be completed. Safety factors are to be applied to the infiltration rate as per the Low Impact Development Stormwater Management Planning and Design Guide prepared by CVC and TRCA, 2010 - versions 1.0. Also, a minimum 1.0 m separation from the invert of the underground storage system to the seasonally high groundwater table is required for systems incorporating infiltration measures into the design. For any underground storage system, approval of the design from a geotechnical perspective (infiltration rates, hydrostatic uplift, cover requirements, etc.) is required from a Geotechnical Engineer.

12.12 Roof Leaders

Leaders are to be discharged to ground surface splash blocks and flows to be directed away from the building in such a way as to prevent ponding or seepage into weeping tile. In residential development, roof leader soakaway pits (see Std. Dwg. No. 11) may be required as part of the stormwater management design. No connections are to be installed directly to storm sewers.

12.13 Foundation Drains

The underside of footing elevation must be a minimum of 0.3 metres above seasonal high ground water table as determined by a Geotechnical Engineer.

Foundation drains shall be in accordance with the Ontario Building Code and connected to a sump pump, which is to be discharged to an at-grade splash pad overland.

In the event that the footings must be lower than the groundwater table elevation, the underside of the foundation drain / weeping tile shall be a minimum 300mm above the estimated seasonal high groundwater table elevation.

Foundation drains shall not be connected to sanitary sewers. In some cases, depending on site parameters, storm service laterals may be permitted, at the discretion of the Town Engineer, at which time the sump pump discharge shall be controlled as outlined in Std. Dwg. No. 21.

12.14 Stormwater Quality Control

The selection of Best Management Practices (BMP) for water quality control shall be applied. When selecting and designing BMP's, reference should be made to the Ministry of the Environment Stormwater Management Planning (SWMP) and Design Manual, latest revision.

The BMP selection process shall review all environment constraints and provide rationale for the selection of alternatives for a specific site as outlined in detail in the above noted MOE document.

In all cases, infiltration of stormwater from rooftops and grassed areas by using dry wells, infiltration trenches, buffer zones, grass swales, etc. shall be the

primary consideration for stormwater quality control. Infiltration areas would be subject to the recommendations of a hydro-geological and soils investigation report. Run-off from roadways and parking lots must be treated prior to infiltration or discharge to a watercourse. For developments where infiltration is not possible or is limited, wet ponds shall be considered.

Oil grit separators (OGS) may be considered in isolated, in-fill situations as a means of stormwater quality control when used in conjunction with other SWMP methods in a “treatment train”, in accordance with MOE SWMP manual guidelines. Acceptable OGS products include Stormceptor, and Echelon Environmental chambers.

12.15 Wet Pond Design Criteria

The wet pond shall be designed in accordance with the MOE Stormwater Management Planning and Design Manual; however, must incorporate the following municipal requirements:

- a. The side slopes shall be a maximum 5:1.
- b. Retaining walls will not be permitted along the perimeter of retention/detention facilities – all sides are to be sloped.
- c. The maintenance platform shall be minimum 6.0m x 6.0m in size, paved or turfstone surface and shall be constructed to an elevation higher than the springline of the inlet pipe to the pond.
- d. The pond block shall be delineated from adjacent residential land uses with 1.5m high black vinyl chain link fence per OPSD 972.130 placed wholly within the pond block.
- e. All vertical drops around the pond, including the concrete headwalls, shall be fenced with a galvanized pedestrian handrail as per OPSD 980.101.
- f. Gates shall be provided for accesses to the maintenance platform and inlet and outlet structures as required.
- g. Permanent pool shall be equipped with a fountain aerator, in accordance with Town Std. Dwg. No. 18.
- h. A SWM Pond Landscaping Plan shall be provided. SWM facility landscaping shall be designed by a Landscape Architect in accordance with Section 4.6.1 of the Ministry of Environment, Conservation and Parks (MECP) Stormwater Management Planning and Design Manual (March 2003) using native species. Acceptable deciduous and coniferous species suitable for planting within the Town's SWM facilities are provided in Section 13: Landscaping of these Engineering Standards and Section 3 Stormwater Management Pond Planting of the NVCA Stormwater Management Guidelines. SWM facility landscaping is to be designed to discourage growth of invasive and noxious weeds such as cattails to the satisfaction of the Tow.
- i. Headwalls and vertical structures shall be concrete or stackable armour stone.
- j. Inlet and outlet pipe structures shall be concrete, PVC, or HDPE.
- k. SWM ponds shall be provided with a 3.0m wide platform constructed of 50mm HL-4 hot mix asphalt over 200mm of compacted granular ‘A’ around the entire perimeter at the top of slope for safety purposes, for maintenance

- access around the pond and to form part of the pedestrian trail system.
- l. Complete the Stormwater Management Facility Specification Summary per Appendix D and include in the final Stormwater Management Report Operations and Maintenance Manual as required.
 - m. The bottom of the sediment Forebay shall be hard surface (30MPa concrete or cable mat) to the satisfaction of the Town Engineer.
 - n. Stormwater Management ponds shall be provided with warning signage per Standard Drawing No. 19. The number and location of signs will be subject to approval from the Town Engineer on a site specific basis. Signs to be installed prior to occupancy.
 - o. The Operation and Maintenance Manual shall identify the minimum expected cleanout frequency for the sediment forebay, as well as identify the sediment depth that warrants the cleanout.

Prior to municipal assumption, the Developer shall be responsible to cleanout the SWM pond. Further, the Developer shall direct his engineer to update the Stormwater Management Facility Specification Summary after cleanout.

12.16 Municipal Drains

Where development proposals include any sort of alterations to a Municipal Drain, the developer is required to petition the Town in accordance with the Ontario Drainage Act. Regulations and specifications of the Ontario Drainage Act shall be strictly adhered to and the design specified by the Engineer's Report for the Municipal Drain shall be met.

13. STORM SEWERS

13.1 General

Storm sewers shall be provided to serve the whole of the development and shall give consideration to upstream future developments, as applicable.

Generally, storm sewer systems shall be designed in accordance with the Ministry of Environment and Ministry of Transportation Guidelines.

The storm sewers shall be connected to the Town's storm sewer system or discharged to a natural watercourse as approved by the Town, the Ministry of the Environment and Conservation Authority.

The storm sewer system shall be designed by a recognized engineering method such as Rational Method using the 5-year Town rainfall intensity curve and a maximum time of concentration of 15 minutes at the inlet of the storm sewer system. This shall apply where the upstream drainage area does not include large open space areas, in which case the inlet time of concentration is to be calculated in accordance with the Ministry of Transportation Drainage Manual.

The minor drainage system (i.e. storm sewers) are to be designed to convey at a

minimum the 1:5-year return frequency design storm peak flow with adjustments for climate change. The major drainage system (overland flow routes) are to be designed to convey the greater of the 1:100-year return frequency design storm (adjusted for climate change) or Regional Storm peak flow. If the combination of the minor and major drainage systems have insufficient capacity to convey the greater of the 1:100-year return frequency design storm (adjusted for climate change) or Regional Storm peak flow, the capacity of the minor drainage system should be increased such that the peak flow produced by the governing major storm event is safely conveyed to the downstream outlet.

Where the seasonal high ground water table is at or above the spring line elevation of the storm sewer, the curb line subdrain shall be installed at or below the pipe spring line on the outside of curb.

Alternatively, a perforated pipe/open joint storm sewer system complete with filter fabric sock will be considered.

Except for special cases, the downstream pipe diameter shall always be greater than or equal to the upstream pipe diameter.

All private developments require an Operations and Maintenance Manual for the regular inspection and maintenance for cleaning out catchbasin sumps and flushing of storm sewer pipes, as per Appendix E.

13.2 Material

All materials shall be CSA Certified and in accordance with the Town approved materials list as amended.

Minimum size of storm sewer pipe shall be 300 mm diameter. Catchbasin leads shall be minimum 300 mm diameter.

Where the main sewer is 450 mm dia. or less the spring lines of the lateral and the main sewer shall match. Where the main sewer is greater than 450 mm dia. the invert of the lateral and spring line of the main sewer shall match.

13.3 Upsizing for External Lands

The Town may require a larger storm sewer size on parts of the development than required for the development alone.

13.4 Storm Sewer Pipe

Storm sewer construction and testing shall conform to the requirements of the Ontario Provincial Standard Drawings and Specifications for sewer construction. Flexible pipes shall be embedded in accordance with OPSD 802.010 and rigid pipe shall be embedded in accordance with OPSD 802.031.

Main sewer connections across roadways shall be backfilled with approved granular materials, thoroughly compacted in layers.

13.5 Storm Sewer Maintenance Holes and Catchbasins

Concrete Maintenance holes shall be provided at all changes in direction of the sewer and at all street intersections, but no further apart than 150 m. Catchbasins and Catchbasin Maintenance holes shall not be located in driveways. Maintenance holes shall be minimum 1200 mm inside diameter. Benching shall be provided per OPSD 701.021 in all storm Maintenance holes and catchbasin Maintenance holes greater than 1800 mm diameter in size. Catchbasin Maintenance holes equal to or less than 1800 mm diameter in size shall have sumps. All storm Maintenance holes covers shall conform to OPSD 401.010, closed cover.

Catchbasins shall be provided on both sides of the street at all low areas but no further apart than 60 m. Double catchbasins shall be provided at all sags in the street. Catchbasins shall have sumps; however, rear lot catchbasins shall be without sumps. All catchbasin frames and grates shall conform to OPSD 400.020.

Maintenance hole and catchbasin covers shall be set on a minimum of 50 mm and a maximum of 150 mm of HDPE adjustment rings or approved equivalent. Precast concrete adjustment units shall be installed as per OPSD 704.010 600mm max height or 3 riser rings.

Maintenance holes as per OPSD 704.010 within the travelled portion of the roadway must be initially installed such that the cover is flush with base course asphalt and raised to be flush with finished grade prior to the placement of top course asphalt. Adjustment of top of grate to match top course asphalt may be provided by cutting base asphalt around the frame and grate and raising with HDPE adjustment rings or approved equivalent adjustment ring, or by using cast iron Sigma riser rings (or approved equivalent). Alternatively, the Developer may use Bibby-Ste-Croix Autostable adjustable frames at the time of initial maintenance hole installation, which can be adjusted at the time of paving surface course asphalt.

Structures within the curb line must also be initially installed with the cover set to base course asphalt and raised to finished grade in accordance with OPSD 610.010.

Maintenance hole steps shall be per OPSD 405.010 hollow rungs installed at 300 mm spacing with a maximum 600 mm from the top of grate to the first step.

Catchbasin leads shall be connected to the main sewer through a Maintenance hole except where the main sewer size exceeds 450 mm dia. in which case the lead can be connected directly to the main sewer with manufactured tees. Catchbasin leads to be at a minimum 0.5% grade.

A minimum of two catchbasins shall be required on the outside radius of all cul-de-sacs and crescents.

Catchbasins are to be located to avoid conflict with driveways.

13.6 Storm Sewer Services

Where applicable, storm service connection pipes are to be PVC SDR 28 and white in colour (to distinguish from sanitary laterals) complete with rubber gasketed bell and spigot joints at a minimum of 1% slope and 1.2m cover at property line.. The storm service lateral shall be extended 1.5m into the private lot, consistent with sanitary sewer and water services.

Services for commercial/ industrial/ institutional shall be equipped with a maintenance hole at property line.

13.7 Rear Lot Catchbasins

It is preferred that use of rear lot catchbasins be avoided whenever possible by way of appropriate lot grading design. Low points in the rear of lots may be avoided by providing rear-to-front lot grading drainage.

Rear lot catchbasins are required to provide a drainage outlet for rear yard surface drainage systems where a positive outlet is not available, or the number of lots serviced by a positive draining swale exceeds the length of six (6) freehold lots, or 75 m.

Each rear lot catchbasin shall service a maximum of twelve (12) lots.

The storm sewer pipe for rear lot catchbasins shall be offset 0.75 m from the property line within the 3.0 m wide side or rear lot easement.

Rear lot catchbasins shall be per OPSD 705.030 without sumps and shall be connected to the trunk storm sewer by a Maintenance hole structure.

Rear lot catchbasin storm sewer pipe leads shall be concrete.

13.8 Miscellaneous

The Town shall not be liable for any costs arising out of the construction of storm sewers for the development.

All sewers, Maintenance holes and catchbasins must be inspected, cleaned out and flushed prior to assumption into the municipal system.

The complete system shall be flushed and inspected by an approved video camera testing company and the Town Engineer shall be provided with a copy of the appropriate data.

CCTV inspection shall be undertaken per OPSS 409 as directed by the Town following the installation of all utilities. CCTV inspections are to be conducted:

- On all mainlines and lateral services;

- Prior to the issuance of the Certificate of Substantial Completion (Basic Services), and;
- Prior to the placement of surface course asphalt.

14. LANDSCAPING

14.1 Tree Preservation, Compensation and Landscaping

A Tree Inventory / Preservation, Compensation and Landscaping Plan(s) and Report must be prepared for all developments.

All trees with 100mm dia. trunk and larger at 1.2 m up from base are to be included in the tree inventory (at minimum).

The Developer must preserve all healthy trees within the limits of the development in accordance with the Tree Inventory / Preservation Plan acceptable to the Town. No trees whether on the road allowance, the parkland, or on the individual lots, shall be removed without the written permission of the Town.

The Developer must compensate the Town for any trees removed from existing municipal rights-of-way. On-site compensation will also be required as determined by the Town.

The Developer shall plant three (3) trees per low density residential lot and two (2) trees per medium density residential lot at least one tree being a native hardwood variety. Refer to STD. DWG No. 9A & 9B. No tree planting will be permitted in the Municipal right-of-way and shall be a minimum of 1.0 metre behind the property line to the centre of tree trunk, unless otherwise permitted.

Where, at the discretion of the Director of Planning and/or the Director of Public Works, the minimum number of yard tree planting requirements are either not feasible or are waived by the applicable purchaser, the cumulative deficiency of lot-level trees on all Lots and Blocks in a development shall serve to increase the number of supplemental plantings that Municipal staff may require on other Lots and Blocks within the development lands. Ultimately, the overall landscaping design for the entire proposed development is subject to approval from the Director of Planning and the Director of Public Works.

The Developer shall maintain existing vegetation and shall provide additional vegetation as may be reasonably required by the Town.

The Developer must provide landscaping plans that shall include the following:

- Protection or preservation of existing trees;
- Tree protection / hording limits and details;
- Compensation plantings;
- The number of trees to be planted being a minimum of three (3) per single

- family dwelling / low density lot, and/or two (2) per medium density lot;
- The species of trees to be planted;
- Planting details;
- A minimum trunk calliper and minimum height;
- Fencing limits and details;
- Trails;
- Decorative entry feature details (where applicable).

A minimum of one (1) tree in the front of the lot may be acceptable on lots that back onto a wooded area.

The Developer shall delineate with construction fencing the trees or treed area to be retained in accordance with OPSS 801. This delineated area shall be established in consultation with the Town and may require a boundary survey undertaken by an Ontario Land Surveyor.

All trees to meet the standards of Canadian Nursery Trades Association and shall be planted with a minimum two-year warranty. The warranty period shall be two-years from the date of Certification regarding quality and health of the trees, which shall be issued by the Developer's Landscape Architect or Arborist. Any replacement trees shall also have a two-year warranty from the date of Certification.

The following is a list of hardwood and softwood varieties acceptable for planting in the subdivision:

Deciduous Tree Species (minimum 50 mm calliper at 1.2 m from bottom of trunk, minimum height 2.5 m):

Common Name	Scientific Name
Autumn Blaze Maple	Acer x freemanii 'Jeffersred'
Red Maple	Acer rubrum
Silver Maple	Acer saccharinum
Sugar Maple	Acer saccharum
Ohio Buckeye	Aesculus glabra
Paper Birch	Betula papyrifera
Blue Beech	Carpinus caroliniana
Common Hackberry	Celtis occidentalis
American Beech	Fagus grandifolia
Maidenhair Tree	Ginko biloba
Thornless Honeylocust	Gleditsia triacanthos var. inermis
Ironwood	Ostraya virginiana
London Plane Tree	Platanus x acerifolia 'Bloodgood'
Big-toothed Aspen	Populus grandidentata
Trembling Aspen	Populus tremuloides
Kwanzan Japanese Cherry	Prunus serrulata 'Kwanzan'
Chokecherry	Prunus virginiana
Schubert Chokeberry	Prunus virginiana 'Schubert'
Bradford Ornamental Pear	Pyrus calleryana 'Bradford'
Chanticleer Ornamental Pear	Pyrus calleryana 'Glen's Form'
Redspire Ornamental Pear	Pyrus calleryana 'Redspire'
White Oak	Quercus alba
Bur Oak	Quercus macrocarpa
Pin Oak	Quercus palustris
English Oak	Quercus robur
Red Oak	Quercus rubra
Ivory Silk Tree Lilac	Syringa reticulate 'Ivory Silk'
Little Leaf Linden	Tilia cordata
Glenleven Linden	Tilia x flavescens 'Glenleven'
Homestead Elm	Ulmus x 'Homestead'

Coniferous Tree Species (minimum height 1.5 m):

Common Name	Scientific Name
White Fir	Abies concolor
Tamarack	Larix laricina
White Spruce	Picea glauca
Eastern White Pine	Pinus strobus
Douglas Fir	Pseudotsuga menziesii
Eastern White Cedar	Thuja occidentalis
Eastern Hemlock	Tsuga canadensis

In some cases, through Planning approval processes, medium and high density blocks may receive exemptions to the Zoning By-law that leads to smaller overall landscaped areas on the lots. This may create a challenge to design and plant large trees in the front and rear of the lot without conflict of the root system with the driveway, servicing, soakaway pits, rear lot catch basin leads, etc. In these instances, at the discretion of the Town, the Developer's Landscape Architect may propose smaller, ornamental trees in lieu of the species provided above for Town review, consideration and acceptance. It would be expected that each medium or high density lot would still be provided with two tree plantings (i.e. one at the front and one at the rear), but the trees may be of different variety species than those listed above. However, in no case shall the proposed ornamental trees be fruit bearing or flowering species.

All trees must be nursery stock with burlap or wire baskets and planted in accordance with good nursery practices.

A provision for the planting of supplemental trees will be a requirement for all new developments. The number of supplemental trees shall be at the discretion of the Town. The location of the supplemental trees shall be determined in the field in consultation with municipal staff.

14.2 Topsoil and Sod

Topsoil shall be natural, fertile, loamy agricultural soil capable of sustaining plant growth with sufficient water retention capacity to help promote water conservation by reducing the need for lawn watering.

All topsoil must be tested for suitability with reference to the specifications of the Nursery Sod Growers Association of Ontario and Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) fact sheet for "Lawn Establishment". Soil testing shall be completed by an OMAFRA accredited soil-testing laboratory. Best Management Practices shall be used to determine the suitability of topsoil proposed to be applied. Prior to placement, an "Agronomy Report" must be prepared by the accredited soil-testing laboratory verifying that the topsoil is suitable to support healthy turf growth, does not contain pesticides or industrial contaminants and provides recommendations for fertilization, all to the satisfaction of the Town of Wasaga Beach.

As a guide, the composition of topsoil shall be as follows:

- Sand: 45 – 70%
- Clay: 1 – 20%
- Silt: 0 – 30%
- Organic material: 4 – 6%.

Nutrient ratios shall be measured with recommendation in the soil suitability report for placement of Phosphorous (P), Potassium (K) and Nitrogen (N) to promote and maintain turf growth.

Topsoil is to have an acidity range (pH) between 6.0 and 7.5.

Native on-site topsoil material may be used subject to the recommendations of an Agronomy Report. The quality of topsoil is to be confirmed through laboratory testing at the Developer's expense prior to placement. The consultant shall take samples from at least three random locations from the stockpiles, and tests shall be conducted on a combined mixture of the three samples. Testing shall include gradation, organic matter, pH value, and levels of phosphorous (P), and potassium (K).

Phosphorous (P) and potassium (K) shall be increased based on the recommendations of the geotechnical consultant.

If native site topsoil material does not meet the above requirements, the geotechnical consultant may make recommendations for amendments and/ or blending of topsoil with imported material to provide a final product that is acceptable to the Town.

Prior to placement of topsoil, the subgrade must be graded to eliminate low/ uneven areas to ensure consistent topsoil thickness and provide positive surface drainage. A pre-sod inspection is to be completed by the developer's engineer and the Town Engineer prior to placement of sod.

All lots are to be completely sodded unless otherwise indicated on the "Accepted for Construction" drawings. All sodded areas are to be provided with minimum thickness of 150 mm of topsoil that meets the above noted criteria. The topsoil shall be screened clear of all stones in excess of 25 mm, debris and woody material and shall be free of other noxious weeds etc. to the satisfaction of the Town. The topsoil overlaid with sod will provide a total topsoil/ turf thickness of approximately 175 mm.

Sod shall be Fine Fescue/Kentucky Bluegrass nursery sod containing 60% - 70% Kentucky Bluegrass and 30% - 40% Creeping Red, Chewings or Hard Fescue as specified by the Nursery Sod Growers Association of Ontario (NSGAO). Sod shall be placed with sufficient density such that surface soil is not visible and shall be placed to match existing adjacent elevations at all edges.

All sod shall be machine rolled after placement.

All areas that are to be provided with hydraulic seed and mulch in accordance with the "Accepted for Construction" drawings shall be provided with a minimum thickness of 150 mm of topsoil.

The primary seed mixture for hydraulic seed and mulch shall be composed of the following:

- 40% Creeping Red Fescue
- 30% Chewings Fescue
- 30% Hard Fescue

All sodded and/ or seeded areas are to be guaranteed by the Developer for minimum one year after placement. Sod within the Town owned rights-of-way (boulevard sod) shall be acceptable to the Town for the Assumption inspection.

14.3 Fencing

For stormwater management pond fencing requirements, see Section 11.15 of these Engineering Standards.

Fencing shall be provided to separate privately owned lands from Municipally owned lands / blocks as required in the Development Agreement. Such fencing shall be constructed wholly within the Municipal property.

The following fencing is required prior to issuance of the Certificate of Substantial Completion (Full Services) for various land uses unless otherwise stipulated in the Site Plan or Subdivision Agreement:

- a. Developed parks - 1.5 m high black vinyl chain link fence
- b. Walkways - 1.8m tight board privacy fence
- c. Open Space / Environmentally Protected / natural wooded areas - 1.5m black vinyl chain link fence.
- d. Fencing to separate commercial land use from residential – typically 1.8 m high tight board privacy fence
- e. 1.8 m high tight board privacy fence is required along lot flankage to collector or arterial roads where a noise fence is not required as well as on flankage abutting community post boxes
- f. New residential development abutting existing residential lots – 1.8 m high tight board privacy fence
- g. Residential lots abutting a school block shall be provided with fencing in accordance with requirements according to the school board
- h. Noise attenuation fencing shall be constructed in accordance with the development Noise Study and shall be located wholly within the development site unless specified otherwise in the Site Plan / Subdivision Agreement.
- i. Private access gates are not permitted through Municipally owned fences, other than as stipulated in the Town's Corporate Gate Policy.

14.4 Streetscaping Features

Bicycle racks and public benches are to be purchased from Toronto Fabricating and Manufacturing Co. The bicycle rack, style #937-SM or else bicycle rack #962-BR may be used as applicable, and the bench is style #1077-S.

15. STANDARD DRAWINGS

Ontario Provincial Standard Drawings shall apply together with the attached Municipal Standard Drawings:

Std.Dwg.No.1A&1B	-	Town of Wasaga Beach – General Notes
Std. Dwg. No. 2A	-	Standard Cross-Section: Local Residential Subdivision Road on 20 m R.O.W.
Std. Dwg. No. 2B	-	Standard Cross-Section: Collector Road on 20 m R.O.W.
Std. Dwg. No. 2C	-	Standard Cross-Section: Collector Road with Bicycle Lanes / 10.5 m Paved Width on 23 m R.O.W.
Std. Dwg. No. 2D	-	Standard Cross-Section: Local Industrial Road on 20m R.O.W.
Std. Dwg. No. 2E	-	Standard Cross-Section: Low-Density Private Residential Development Road on 8.5 m Corridor
Std. Dwg. No. 2F	-	Standard Cross-Section: Medium-Density Private Residential Development Road on 10.0 m Corridor
Std. Dwg. No. 2G	-	Standard Cross-Section: Minimum Medium-Density Private Residential Development Road on 8.0 m Corridor
Std. Dwg. No. 3	-	Bicycle Lane Details
Std. Dwg. No. 4	-	Typical 90 ⁰ Crescent c/w Curb and Gutter
Std. Dwg. No. 5	-	Typical Cul-de-Sac c/w Curb and Gutter and Water Servicing
Std. Dwg. No. 6	-	Hydrant and Valve Detail
Std. Dwg. No. 7	-	Walkway Typical Cross-Section
Std. Dwg. No. 8	-	Removable Entrance Post
Std. Dwg. No. 9A	-	Typical Low-Density Residential Lot Tree Planting
Std. Dwg. No. 9B	-	Typical Medium-Density Residential Lot Tree Planting
Std. Dwg. No. 9C	-	Topsoil and Sod Requirements
Std. Dwg. No. 10	-	Off-Road Catchbasin Detail

- Std. Dwg. No. 11 - Roof Leader Soakaway Pit Detail
- Std. Dwg. No. 12A - Sanitary Sewer Service Connection Detail
- Std. Dwg. No. 12B - Residential Water Service Connection Detail
- Std. Dwg. No. 13 - Water Distribution System 50 mm Test Point By-Pass Schematic
- Std. Dwg. No. 14A - Typical Water Meter Installation: 25mm to 50mm dia. Water Service
- Std. Dwg. No. 14B - Typical Water Meter Installation: 100mm dia. and Greater Water Service
- Std. Dwg. No. 15A - Water Meter Chamber
- Std. Dwg. No. 15B - Typical Water Meter Chamber with Backflow Preventer
- Std. Dwg. No. 16 - Typical Detail of Silt / Sediment Control Fence
- Std. Dwg. No. 17 - Stone Mud Mat Detail
- Std. Dwg. No. 18 - Stormwater Management Pond Fountain Aerator Details
- Std. Dwg. No. 19 - Stormwater Management Pond Warning Sign
- Std. Dwg. No. 20 - Footings, Weeping Tile and Seasonal High Groundwater Table Detail
- Std. Dwg. No. 21 - Sump Pump Discharge Detail
- Std. Dwg. No. 22 - Street Name and Regulatory Signs
- Std. Dwg. No. 23 - Benchmark Monument Layout / Detail
- Std. Dwg. No. 24 - Streetlight Detail

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH TOWN OF WASAGA BEACH STANDARDS AND OPSS. WHERE INCONSISTENCY OCCURS, TOWN STANDARDS GOVERN.
3. CLEAR STONE WRAPPED IN FILTER FABRIC MAY BE SUBSTITUTED FOR PIPE BEDDING MATERIAL IF APPROVED BY THE ENGINEER.
4. DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS-517 AND 518. THE OWNER IS RESPONSIBLE FOR OBTAINING DEWATERING PERMITS AS REQUIRED TO MAINTAIN DRY TRENCH CONDITIONS.
5. UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
6. HYDRO POLES TO BE SUPPORTED AND PROTECTED BY THE CONTRACTOR DURING CONSTRUCTION AS DIRECTED BY WASAGA DISTRIBUTION INC.
7. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH UTILITIES WHICH MAY ALSO BE UNDER CONSTRUCTION.
8. EXISTING GAS MAIN TO BE PROTECTED IN ACCORDANCE WITH ENBRIDGE GAS SPECIFICATIONS.
9. ALL EXISTING PAVED PRIVATE ENTRANCES TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE AND 150mm GRANULAR 'A' BASE TO LIMITS OF CONSTRUCTION.
10. ALL EXISTING GRAVEL OR GRASSED PRIVATE ENTRANCES TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE TO LIMITS OF CONSTRUCTION AND 50mm HL3 TO 2.75m BEHIND CURB.
11. ALL COMMERCIAL ENTRANCES TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE, MATCH EXISTING ASPHALT BASE COURSE(S), 150mm GRANULAR 'A' BASE AND 150mm GRANULAR 'B' SUBBASE TO LIMITS OF CONSTRUCTION.
12. JOINTS WITH EXISTING ASPHALT TO BE SAW CUT PRIOR TO PLACING NEW ASPHALT; DENSO REINSTATEMENT TAPE SHALL BE USED AT THE JOINT OF SURFACE ASPHALT. SURFACE ASPHALT JOINTS TO HAVE MIN. 0.5m WIDE LAP JOINT.
13. ALL BOULEVARDS AND DISTURBED AREAS TO HAVE 150mm SCREENED TOPSOIL AND NURSERY SOD UNLESS OTHERWISE NOTED.
14. PAVED BOULEVARD AREAS TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE ASPHALT AND 150mm GRANULAR 'A' WHERE NOTED.
15. ACCESS TO BUSINESS AND RESIDENTIAL PROPERTIES MUST BE MAINTAINED AT ALL TIMES.
16. THE CONTRACTOR MUST GIVE MIN. 48 HOURS NOTICE TO THE TOWN OF WASAGA BEACH PUBLIC WORKS DEPARTMENT THROUGH THE TOWN ENGINEER FOR OFFICIALS TO BE PRESENT FOR THE OPERATION OF VALVES, TESTING, DISINFECTION AND CONNECTION OF WATERMAIN AND TESTING OF SEWERS.
17. EARTH FILL MATERIAL UP TO AND INCLUDING SUBGRADE TO BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD). GRANULAR BASE AND SUB-BASE TO BE COMPACTED TO 100% SPMDD. HOT-MIX ASPHALT TO BE COMPACTED TO 92% MAXIMUM RELATIVE DENSITY.
18. MINIMUM VERTICAL SEPARATION OF 150mm BETWEEN SEWERS AT CROSSINGS.
19. THE CONTRACTOR MUST OBTAIN A ROAD OCCUPATION PERMIT FROM PUBLIC WORKS PRIOR TO INSTALLATION OF PROPOSED DRIVEWAY AND/OR ANY CONSTRUCTION WORKS WITHIN THE EXISTING MUNICIPAL RIGHT-OF-WAY.
20. ALL DISTURBED AREAS SHALL BE REINSTATED TO EXISTING CONDITION OR BETTER.

SEDIMENT & EROSION CONTROL NOTES:

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED, AFTER WHICH, THEY SHALL BE FULLY REMOVED BY THE CONTRACTOR. SEDIMENT AND EROSION CONTROL MEASURES THAT ARE DESIGNED TO CONTROL RUNOFF FROM SPECIFIC AREAS MUST BE INSTALLED PRIOR TO ANY DISTURBANCE OF THAT PART OF THE SITE.
2. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES MUST BE PRESENTED IN WRITING FOR APPROVAL OF THE TOWN ENGINEER AND THE NOTTAWASAGA VALLEY CONSERVATION AUTHORITY.
3. THE CONTRACTOR SHALL HAVE MATERIALS AVAILABLE ON-SITE TO REPAIR SEDIMENT AND EROSION CONTROL MEASURES IN THE EVENT OF UNFORESEEN CONDITIONS: HIGH WATER, EXTREME RAINFALL EVENTS ETC.
4. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED BY THE ENGINEER BI-WEEKLY AND AFTER EACH MAJOR STORM EVENT. INSPECTION REPORTS TO BE FORWARDED TO THE TOWN ENGINEER BI-WEEKLY. AREAS THAT ARE UNDEVELOPED FOR AN EXTENDED PERIOD OF TIME SHALL BE REVEGETATED WITH TOPSOIL AND HYDRAULIC SEED AND MULCH AS DIRECTED BY THE TOWN.

STORM SEWER:

1. ALL MATERIALS SHALL BE CSA CERTIFIED AND IN ACCORDANCE WITH THE TOWN APPROVED MATERIALS LIST.
2. CLASS 'B' BEDDING AND COVER AS PER OPSD-802.030 (RIGID PIPE) OR EMBEDMENT AS PER OPSD-802.010 (FLEXIBLE PIPE) USING GRANULAR 'A'. USE SELECT NATIVE MATERIAL COMPACTED TO 95% MAXIMUM DRY DENSITY FOR COVER MATERIAL IF APPROVED BY THE TOWN ENGINEER.
3. CATCHBASINS & MANHOLES TO BE BACKFILLED WITH SELECT NATIVE MATERIAL AND COMPACTED TO 95% MAXIMUM DRY DENSITY.
4. STEPS AS PER OPSD-405.010 HOLLOW CIRCULAR ALUMINUM.
5. CATCHBASIN LEADS; - 300mm DIA. FOR SINGLE AND DOUBLE CATCHBASINS.
6. CATCHBASIN FRAMES AND COVERS PER OPSD 400.020.
7. STORM SEWER SHALL BE CCTV INSPECTED.
8. REAR LOT CATCHBASIN LEADS SHALL BE CONCRETE SEWER PIPE.

TOWN OF WASAGA BEACH		
GENERAL NOTES		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.1A
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	

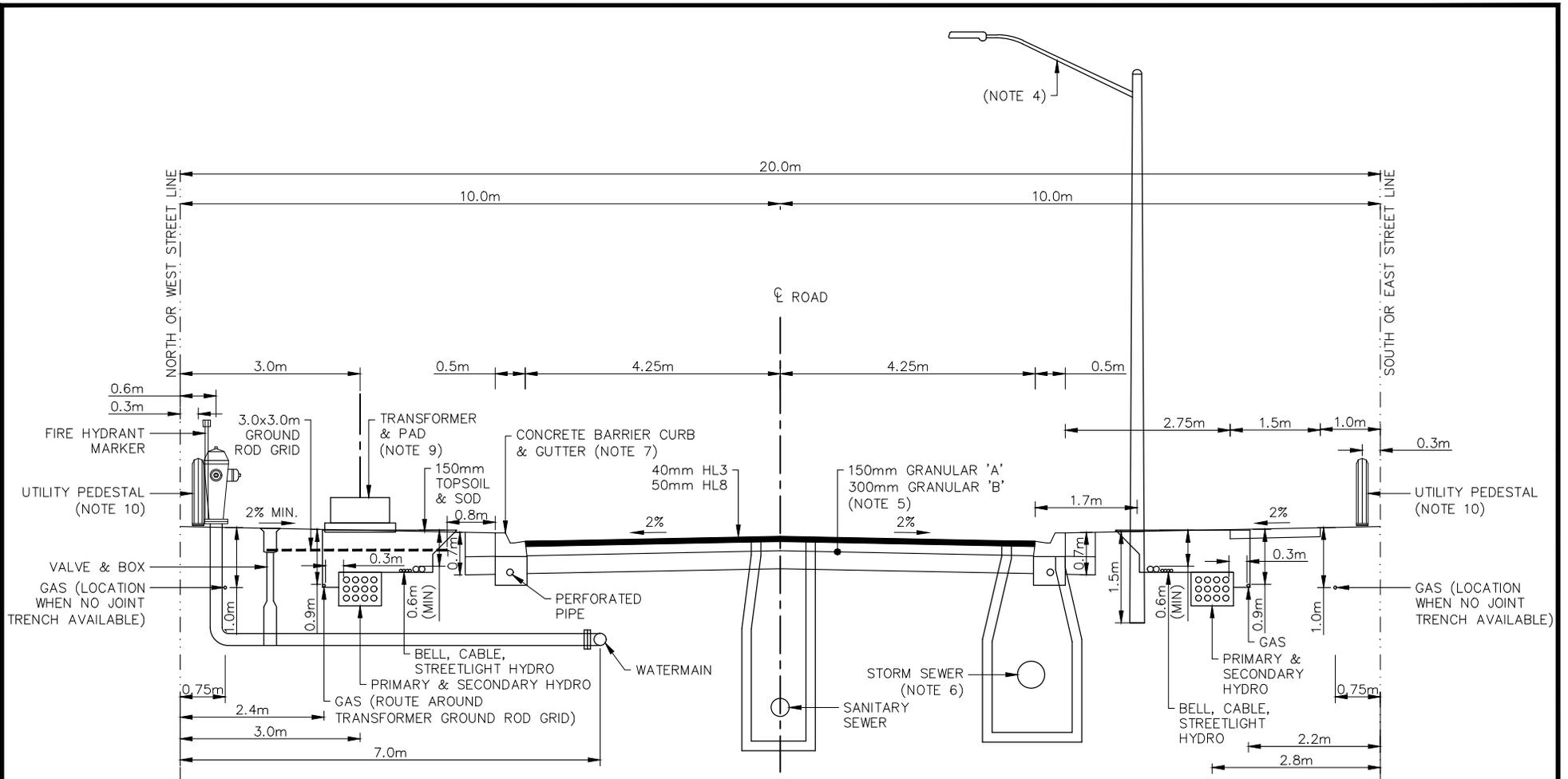
WATERMAIN:

1. ALL MATERIALS SHALL BE CSA CERTIFIED AND IN ACCORDANCE WITH THE TOWN APPROVED MATERIALS LIST.
2. ALL WATERMAIN TO HAVE MINIMUM 1.7m COVER OR APPROVED EQUIVALENT FROST PROTECTION WITH INSULATION.
3. BEDDING AND BACKFILL IN ACCORDANCE WITH OPSS-401.
4. PVC PIPE INSTALLATION TO INCLUDE 12awg TWH SOLID PLASTIC COVERED TRACER WIRE, TWU 75°C 600V OR APPROVED EQUAL. TRACER WIRE CONTINUITY MUST BE TESTED & CERTIFIED BY PUBLIC WORKS STAFF.
5. CATHODIC PROTECTION (S-12 ZINC ANODE @ 30.0m SPACING ON DUCTILE IRON PIPE AND AT ALL METAL RESTRAINTS, FITTINGS, APPURTENANCES, ETC.) TO BE PROVIDED IN ACCORDANCE WITH OPSS-442. CATHODIC PROTECTION IS TO BE CAD WELDED ON WITH MASTIC TAPE. FOR CURB STOPS, 7LB ZINC ANODES CAN BE TWISTED ON BUTTON TWIST NUT.
6. CLASS 'B' BEDDING AS PER OPSD-802.030 (RIGID PIPE) OR BEDDING AS PER OPSD-802.010 (FLEXIBLE PIPE) USING GRANULAR 'A'.
7. THRUST PROTECTION SHALL BE PROVIDED USING MECHANICAL JOINT FITTINGS AND RESTRAINERS.
8. GATE VALVES TO BE LEFT HAND OPENING COMPLETE WITH SLIDE TYPE VALVE BOXES 125mmØ WITH LIDS MARKED WATER AS PER TOWN APPROVED MATERIAL AND PRODUCT LIST.
9. WATER SERVICES COMPLETE WITH MAIN STOP TO BE AS PER TOWN APPROVED MATERIAL AND PRODUCT LIST.
10. WHERE RESIDENTIAL WATER SERVICES ARE TO BE ABANDONED, EXPOSE MAIN STOP, CLOSE AND DISCONNECT SERVICE PIPE, AND SALVAGE THE CURB STOP AND RETURN TO PUBLIC WORKS YARD.
11. ALL WATERMAINS AND SERVICES SHALL BE BACKFILLED WITH APPROVED SITE MATERIAL. ALL BACKFILL SHALL BE COMPACTED TO 95% MAXIMUM DRY DENSITY AS PER OPSS 514. ALL GRANULAR ROAD BASE SHALL BE COMPACTED TO 100% MAXIMUM DRY DENSITY.
12. EXISTING SERVICE LOCATIONS TO BE VERIFIED IN THE FIELD.
13. HYDRANT TO BE AS PER TOWN APPROVED MATERIAL AND PRODUCT LIST WITH MECHANICAL JOINT ENDS, WITH 2-50mm PORTS AND FACTORY INSTALLED STORZ FITTING PER OPSD-1105.010.
14. TESTING CONNECTION TO THE MUNICIPAL WATER SYSTEM SHALL BE PER TOWN STD. DWG. No. 13.
15. MINIMUM VERTICAL SEPARATION 500mm BETWEEN WATERMAINS AND SEWERS. MINIMUM HORIZONTAL SEPARATION OF 2.5m BETWEEN WATERMAINS AND SEWERS.
16. WATERMAINS SHALL BE SWABBED, FLUSHED, DISINFECTED AND TESTED IN ACCORDANCE WITH OPSS 441 WITH TOWN OFFICIALS PRESENT.
17. DISINFECTING OF WATERMAINS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C651 SPECIFICATIONS.
18. ANTI-TAMPERING DEVICES ARE TO BE INSTALLED ON ALL FIRE HYDRANTS FOLLOWING COMPLETION OF ALL WATER SYSTEM TESTING BY THE TOWN. ANTI-TAMPERING DEVICES ARE TO BE REMOVED FROM ALL FIRE HYDRANTS AT END OF WARRANTY PERIOD, PRIOR TO MUNICIPAL ASSUMPTION.

SANITARY SEWER:

1. ALL MATERIALS SHALL BE CSA CERTIFIED AND IN ACCORDANCE WITH THE TOWN APPROVED MATERIALS LIST.
2. BEDDING AS PER OPSD-802.010 USING GRANULAR 'A' COMPACTED TO 95% MAXIMUM DRY DENSITY. USE SELECTED SITE MATERIAL FOR BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY.
3. SANITARY SERVICE LATERALS COMPLETE WITH CLEANOUT TO BE INSTALLED PER TOWN STD. DWG No. 12.
4. LOT SERVICE LOCATIONS TO BE VERIFIED BY CONTRACTOR.
5. MH'S PER OPSD-701.010 WITH FROST STRAPS PER OPSD 701.100 WITH "QUICK ANCHORED" BOLTS.
6. FRAMES AND COVERS PER OPSD-401.010 TYPE 'A'.
7. MH BENCHING PER OPSD-701.021 AND STEPS PER OPSD-405.010 CIRCULAR ALUMINUM.
8. SANITARY SEWER TESTING SHALL INCLUDE INFILTRATION, EXFILTRATION, DEFLECTION (MANDREL) AND CCTV.
9. SANITARY MAINTENANCE HOLES SHALL BE PROVIDED WITH DENSO PETROLIUM TAPE (OR APPROVED EQUIVALENT) AROUND THE OUTSIDE OF ALL SECTION JOINTS.

TOWN OF WASAGA BEACH		
GENERAL NOTES		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.1B
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD TO BE FULLY SODDED WITH 150mm TOPSOIL.
3. ROAD CROSSING DEPTHS FOR UTILITIES:
 -BELL 0.9m
 -GAS 1.0m
 -HYDRO 1.2m
4. STREET LIGHTS - CREE RSW LED LUMINAIRE MOUNTED ON STRESSCRETE CLASS C 9.14m DIRECT BURIED POLE AS PER TOWN STANDARDS.
5. WHERE SELECTED NATIVE SAND IS TO BE USED IN LIEU OF GRANULAR 'B' ROAD BASE, INCREASE GRANULAR 'A' THICKNESS TO 200mm.
6. IN AREAS OF HIGH GROUND WATER TABLE, AN INFILTRATING STORM SEWER SYSTEM MUST BE CONSIDERED PER ENGINEERING STANDARDS.
7. O.P.S.D. 600.040 - EXISTING ROAD IMPROVEMENTS O.P.S.D. 600.070 (TWO STAGE) - NEW ROAD CONSTRUCTION.
8. ALL DRIVEWAYS TO INCLUDE APRON PAVING 2.75m BEHIND CURB AND ALL DRIVEWAY EDGING/CURBING SHALL BE FLUSH WITH DRIVEWAY PER THE TOWN ENGINEERING STANDARDS.
9. TRANSFORMERS INCLUDE 3m x 3m GROUND ROD GRID REQUIRING 0.3m MIN CLEARANCE FROM BACK OF CURB.
10. UTILITY PEDESTALS TO BE 0.3m FROM PROPERTY LINE OR BESIDE HYDRO TRANSFORMERS WHERE APPLICABLE.

TOWN OF WASAGA BEACH

STANDARD CROSS-SECTION
 LOCAL RESIDENTIAL SUBDIVISION
 ROAD ON 20m R.O.W.



DRAWN: MRT

SCALE: N.T.S.

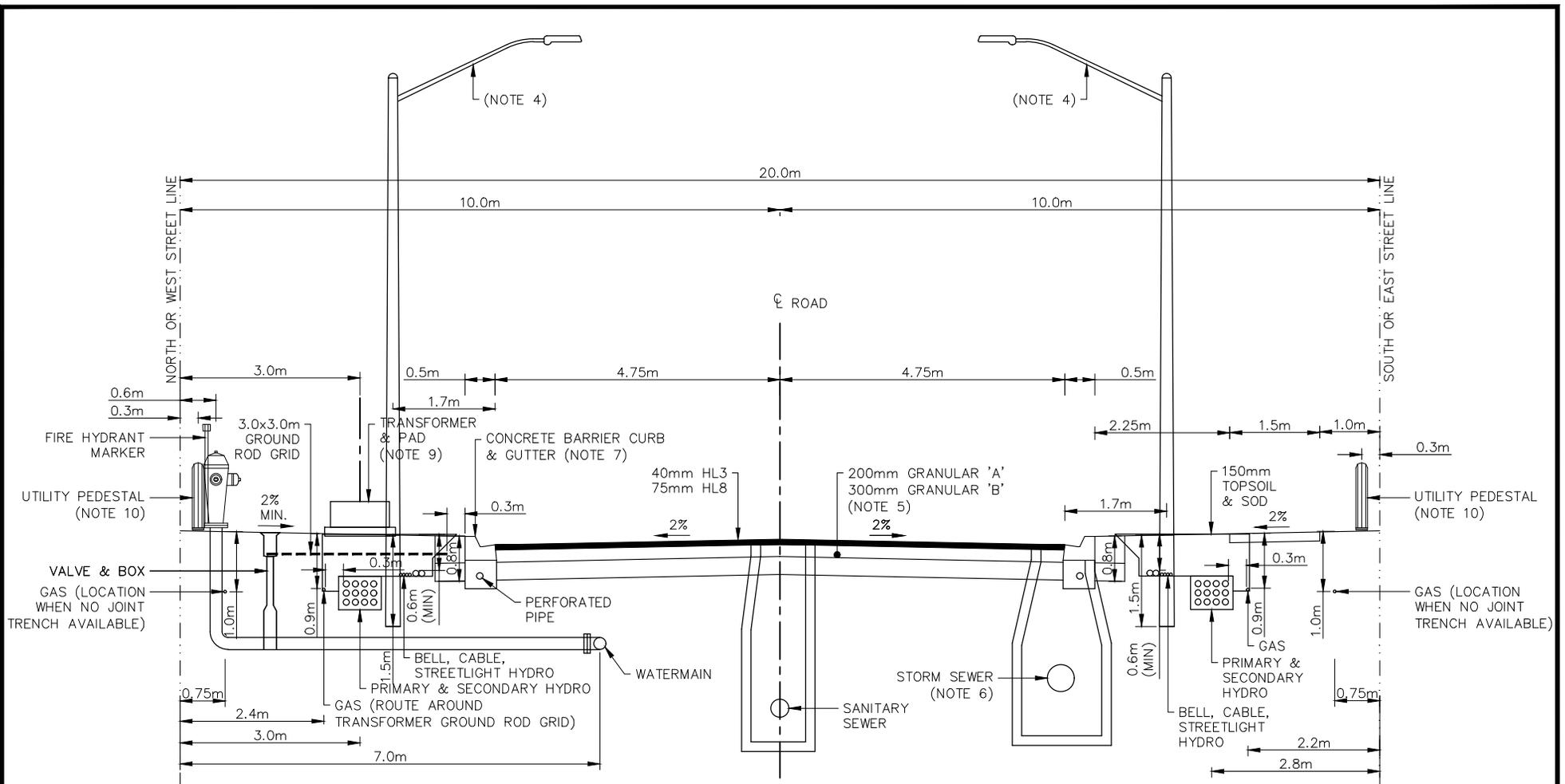
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PLOT: 1:1

CHECKED: MJP

DATE: APRIL 2021

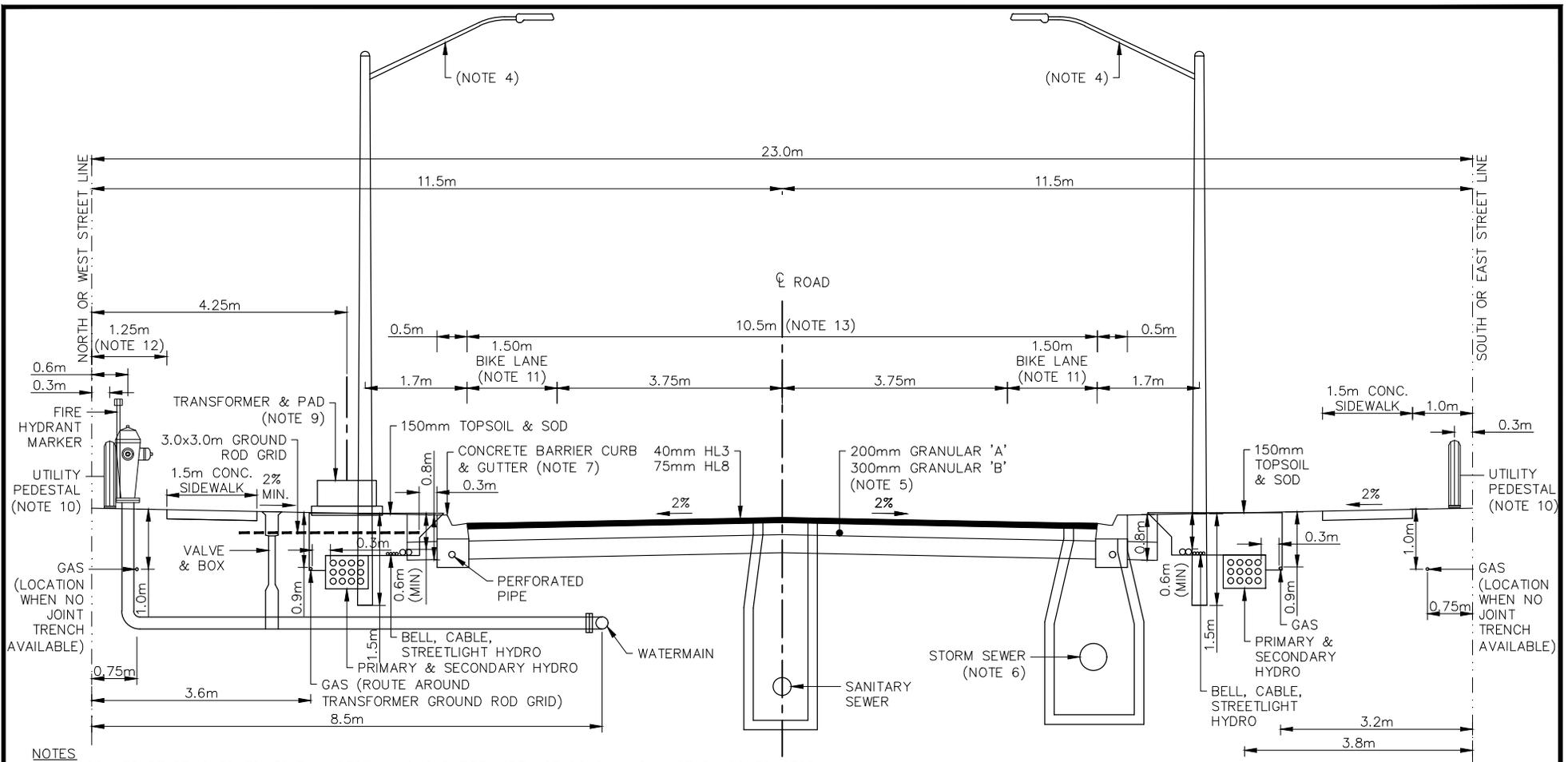
STD.DWG.No.2A



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD TO BE FULLY SODDED WITH 150mm TOPSOIL.
3. ROAD CROSSING DEPTHS FOR UTILITIES:
 - BELL 0.9m
 - GAS 1.0m
 - HYDRO 1.2m
4. STREET LIGHTS - CREE RSW LED LUMINAIRE MOUNTED ON STRESSCRETE CLASS C 9.14m DIRECT BURIED POLE AS PER TOWN STANDARDS.
5. WHERE SELECTED NATIVE SAND IS TO BE USED IN LIEU OF GRANULAR 'B' ROAD BASE, INCREASE GRANULAR 'A' THICKNESS TO 250mm.
6. IN AREAS OF HIGH GROUND WATER TABLE, AN INFILTRATING STORM SEWER SYSTEM MUST BE CONSIDERED PER ENGINEERING STANDARDS.
7. O.P.S.D. 600.040 - EXISTING ROAD IMPROVEMENTS, O.P.S.D. 600.070 (TWO STAGE) - NEW ROAD CONSTRUCTION.
8. ALL DRIVEWAYS TO INCLUDE APRON PAVING 2.75m BEHIND CURB AND ALL DRIVEWAY EDGING/CURBING SHALL BE FLUSH WITH DRIVEWAY PER THE TOWN ENGINEERING STANDARDS.
9. TRANSFORMERS INCLUDE 3m x 3m GROUND ROD GRID REQUIRING 0.3m MIN CLEARANCE FROM BACK OF CURB.
10. UTILITY PEDESTALS TO BE 0.3m FROM PROPERTY LINE OR BESIDE HYDRO TRANSFORMERS WHERE APPLICABLE.

TOWN OF WASAGA BEACH		
CROSS-SECTION COLLECTOR ROAD ON 20m R.O.W.		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MJP	PLOT: 1:1	
CHECKED: MJP	DATE: APRIL 2021	STD.DWG.No.2B



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD TO BE FULLY SODDED WITH 150mm TOPSOIL.
3. ROAD CROSSING DEPTHS FOR UTILITIES:
 -BELL 0.9m
 -GAS 1.0m
 -HYDRO 1.2m
4. STREET LIGHTS - CREE RSW LED LUMINAIRE MOUNTED ON STRESSCRETE CLASS C 9.14m DIRECT BURIED POLE AS PER TOWN STANDARDS.
5. WHERE SELECTED NATIVE SAND IS TO BE USED IN LIEU OF GRANULAR 'B' ROAD BASE, INCREASE GRANULAR 'A' THICKNESS TO 250mm.
6. IN AREAS OF HIGH GROUND WATER TABLE, AN INFILTRATING STORM SEWER SYSTEM MUST BE CONSIDERED PER ENGINEERING STANDARDS.
7. O.P.S.D. 600.040 - EXISTING ROAD IMPROVEMENTS, O.P.S.D. 600.070 (TWO STAGE) - NEW ROAD CONSTRUCTION.
8. ALL DRIVEWAYS TO INCLUDE APRON PAVING 3.25m BEHIND CURB AND ALL DRIVEWAY EDGING/CURBING SHALL BE FLUSH WITH DRIVEWAY PER THE TOWN ENGINEERING STANDARDS.
9. TRANSFORMERS INCLUDE 3m x 3m GROUND ROD GRID REQUIRING 0.3m MIN CLEARANCE FROM BACK OF CURB.
10. UTILITY PEDESTALS TO BE 0.3m FROM PROPERTY LINE OR BESIDE HYDRO TRANSFORMERS WHERE APPLICABLE.
11. SEE STANDARD DRAWING No. 3 FOR BICYCLE LANE DETAILS.
12. WHERE SIDEWALK IS LOCATED ON THE SAME SIDE OF ROADWAY AS FIRE HYDRANTS, THE SIDEWALK SHALL BE 1.25m FROM PROPERTY LINE.
13. THE 10.5m PAVED WIDTH MAY ALSO BE USED FOR PAVING 3x3.5m LANES INCLUDING A CONTINUOUS BI-DIRECTIONAL LEFT TURN CENTRE LANE.

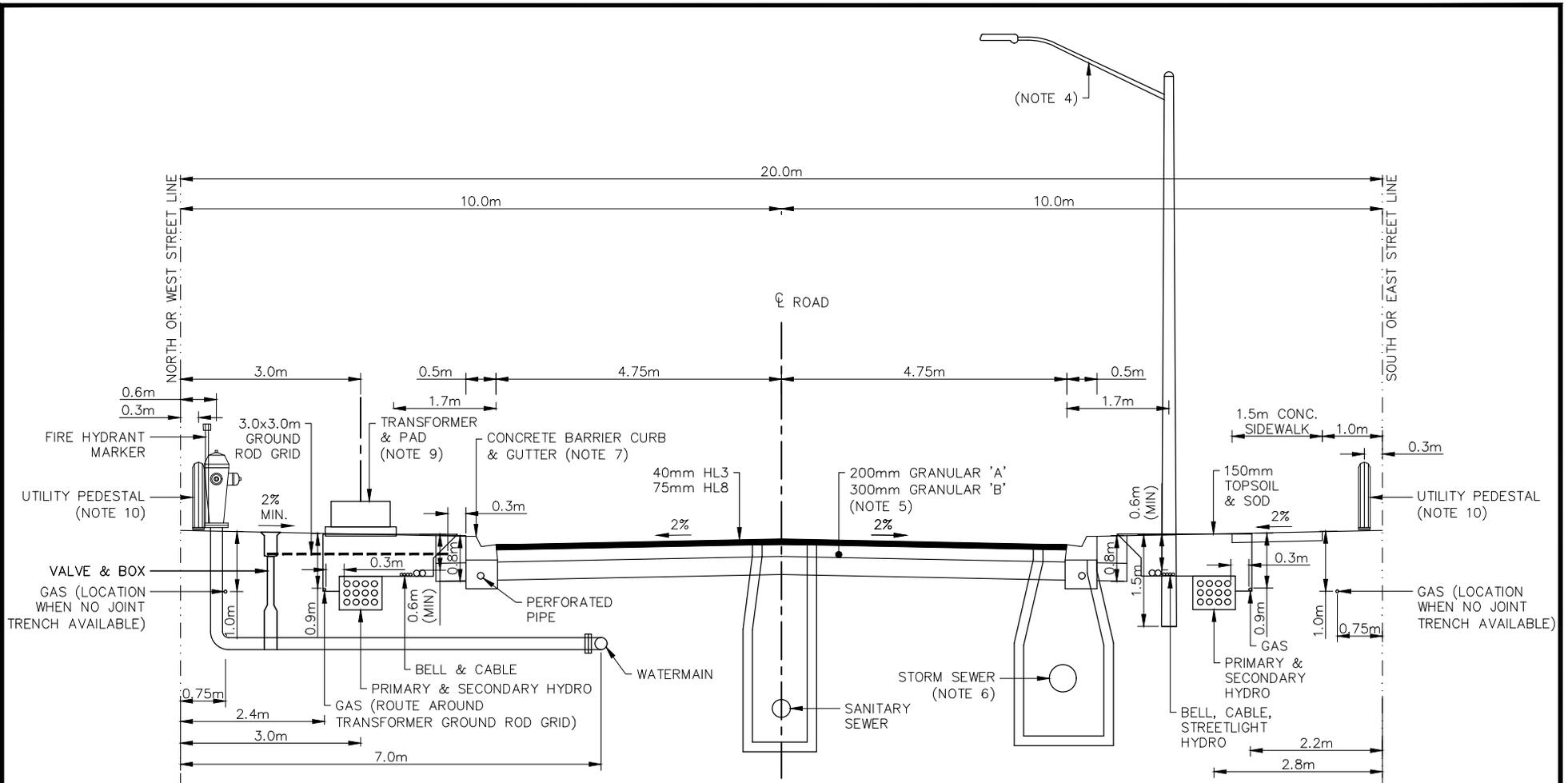
TOWN OF WASAGA BEACH

CROSS-SECTION
 COLLECTOR ROAD WITH BIKE
 LANES/10.5m PAVED WIDTH
 ON 23m R.O.W.



DRAWN: MRT	SCALE: N.T.S.
DESIGN: MJP	PLOT: 1:1
CHECKED: MJP	DATE: APRIL 2021

STD.DWG.No.2C



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD TO BE FULLY SODDED WITH 150mm TOPSOIL.
3. ROAD CROSSING DEPTHS FOR UTILITIES:
 - BELL 0.9m
 - GAS 1.0m
 - HYDRO 1.2m
4. STREET LIGHTS - CREE RSW LED LUMINAIRE MOUNTED ON STRESSCRETE CLASS C 9.14m DIRECT BURIED POLE AS PER TOWN STANDARDS.
5. WHERE SELECTED NATIVE SAND IS TO BE USED IN LIEU OF GRANULAR 'B' ROAD BASE, INCREASE GRANULAR 'A' THICKNESS TO 250mm.
6. IN AREAS OF HIGH GROUND WATER TABLE, AN INFILTRATING STORM SEWER SYSTEM MUST BE CONSIDERED PER ENGINEERING STANDARDS.
7. O.P.S.D. 600.040 - EXISTING ROAD IMPROVEMENTS, O.P.S.D. 600.070 (TWO STAGE) - NEW ROAD CONSTRUCTION.
8. ALL DRIVEWAYS TO INCLUDE APRON PAVING 2.75m BEHIND CURB AND ALL DRIVEWAY EDGING/CURBING SHALL BE FLUSH WITH DRIVEWAY PER THE TOWN ENGINEERING STANDARDS.
9. TRANSFORMERS INCLUDE 3m x 3m GROUND ROD GRID REQUIRING 0.3m MIN CLEARANCE FROM BACK OF CURB.
10. UTILITY PEDESTALS TO BE 0.3m FROM PROPERTY LINE OR BESIDE HYDRO TRANSFORMERS WHERE APPLICABLE.

TOWN OF WASAGA BEACH

STANDARD CROSS-SECTION
LOCAL INDUSTRIAL ROAD
ON 20m R.O.W.



DRAWN: MRT

SCALE: N.T.S.

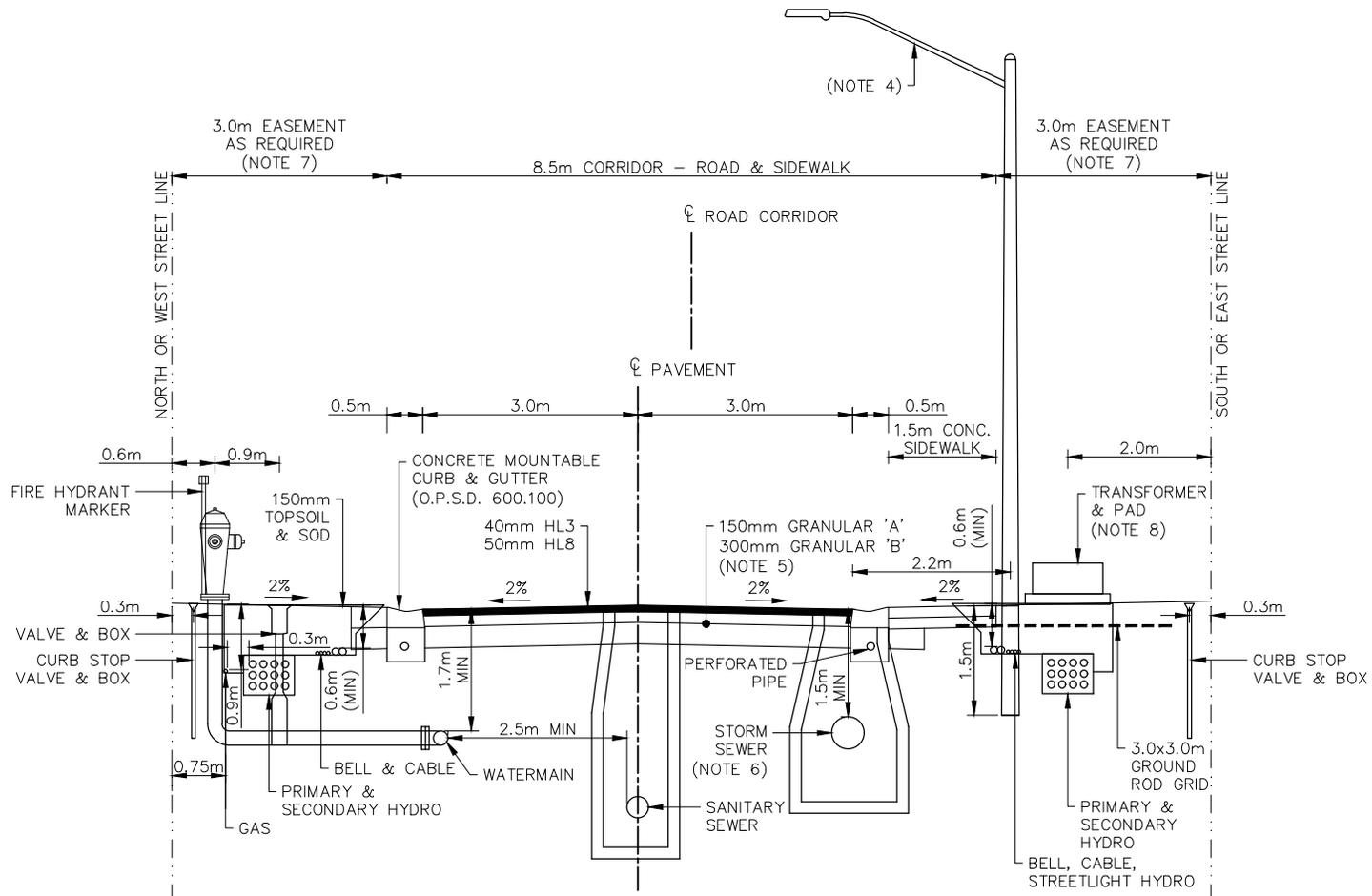
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CHECKED: MJP

DATE: APRIL 2021

STD.DWG.No.2D



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD TO BE FULLY SODDED WITH 150mm TOPSOIL.
3. ROAD CROSSING DEPTHS FOR UTILITIES:
 -BELL 0.9m
 -GAS 1.0m
 -HYDRO 1.2m
4. STREET LIGHTS - CREE RSW LED LUMINAIRE MOUNTED ON STRESSCRETE CLASS C 9.14m DIRECT BURIED POLE AS PER TOWN STANDARDS.
5. WHERE SELECTED NATIVE SAND IS TO BE USED IN LIEU OF GRANULAR 'B' ROAD BASE, INCREASE GRANULAR 'A' THICKNESS TO 200mm.
6. IN AREAS OF HIGH GROUND WATER TABLE, AN INFILTRATING STORM SEWER SYSTEM MUST BE CONSIDERED PER ENGINEERING STANDARDS.
7. EASEMENTS FOR UTILITIES, FIRE PROTECTION AND SNOW STORAGE.
8. TRANSFORMERS INCLUDE 3m x 3m GROUND ROD GRID REQUIRING 0.3m MIN CLEARANCE FROM BACK OF CURB.
9. "NO PARKING - FIRE ROUTE" SIGNAGE SHALL BE INSTALLED ALONG BOTH SIDES OF ROADWAY.

TOWN OF WASAGA BEACH

STANDARD CROSS-SECTION
 LOW DENSITY PRIVATE
 RESIDENTIAL DEVELOPMENT ROAD
 ON 8.5m CORRIDOR

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP

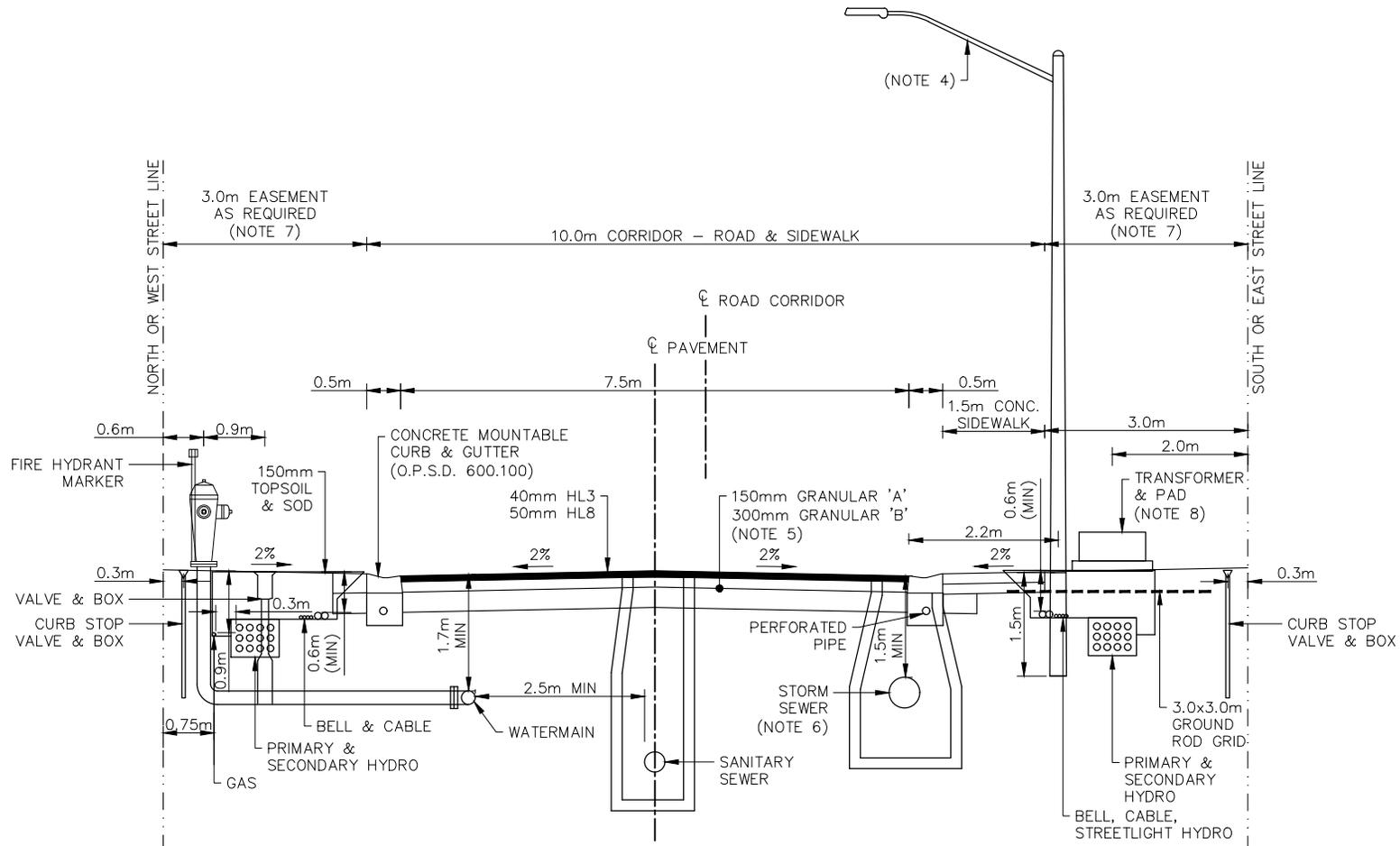
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DATE: APRIL 2021



STD.DWG.No.2E



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD TO BE FULLY SODDED WITH 150mm TOPSOIL.
3. ROAD CROSSING DEPTHS FOR UTILITIES:
 -BELL 0.9m
 -GAS 1.0m
 -HYDRO 1.2m
4. STREET LIGHTS - CREE RSW LED LUMINAIRE MOUNTED ON STRESSCRETE CLASS C 9.14m DIRECT BURIED POLE AS PER TOWN STANDARDS.
5. WHERE SELECTED NATIVE SAND IS TO BE USED IN LIEU OF GRANULAR 'B' ROAD BASE, INCREASE GRANULAR 'A' THICKNESS TO 200mm.
6. IN AREAS OF HIGH GROUND WATER TABLE, AN INFILTRATING STORM SEWER SYSTEM MUST BE CONSIDERED PER ENGINEERING STANDARDS.
7. EASEMENTS FOR UTILITIES, FIRE PROTECTION AND SNOW STORAGE.
8. TRANSFORMERS INCLUDE 3m x 3m GROUND ROD GRID REQUIRING 0.3m MIN CLEARANCE FROM BACK OF CURB.
9. "NO PARKING - FIRE ROUTE" SIGNAGE SHALL BE INSTALLED ALONG THE NORTH OR WEST SIDE OF ROADWAY (SIDE WITH FIRE HYDRANTS).

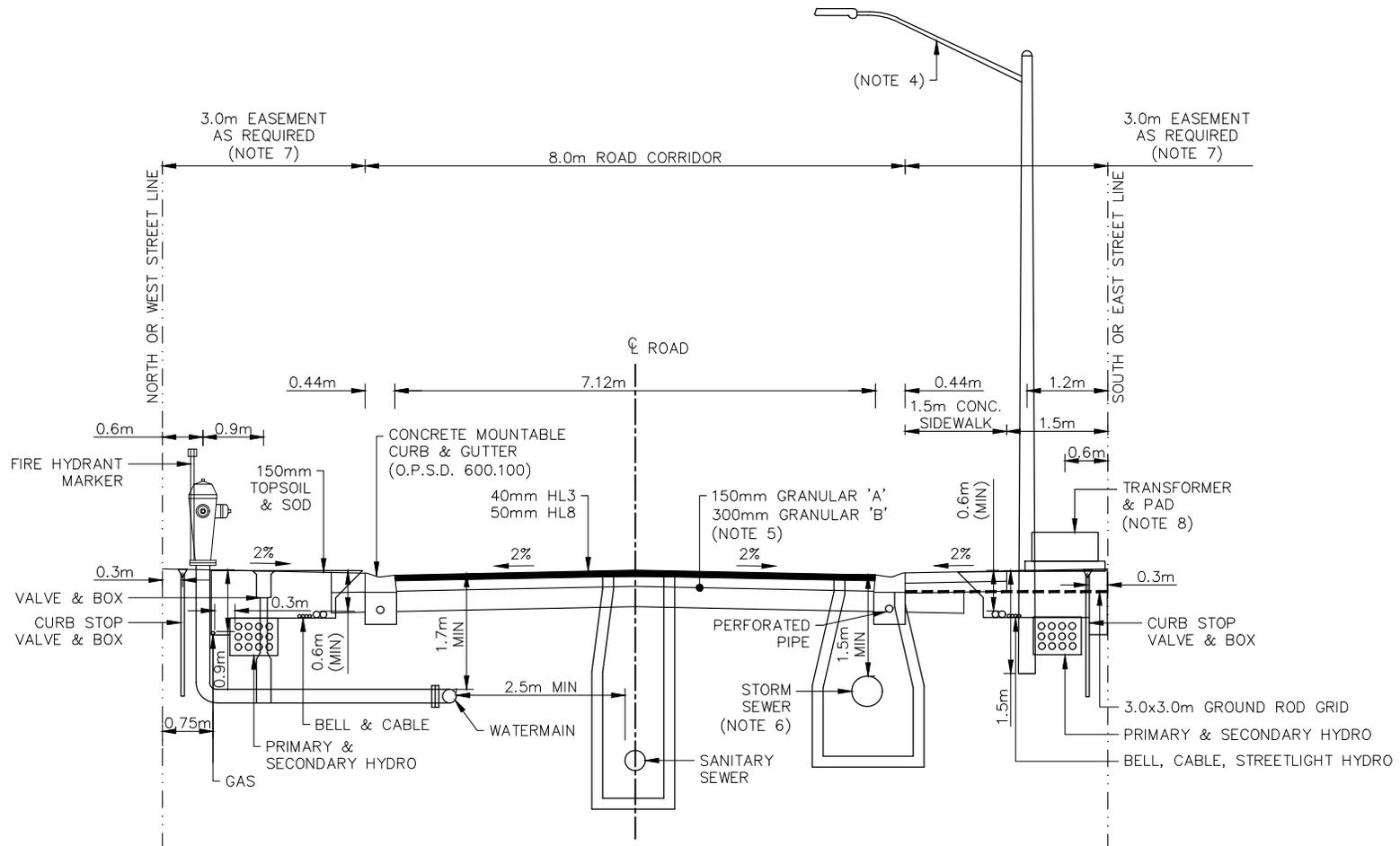
TOWN OF WASAGA BEACH

STANDARD CROSS-SECTION
 MEDIUM DENSITY PRIVATE
 RESIDENTIAL DEVELOPMENT ROAD
 ON 10.0m CORRIDOR

DRAWN: MRT	SCALE: N.T.S.
DESIGN: MJP	PLOT: 1:1
CHECKED: MJP	DATE: APRIL 2021



STD.DWG.No.2F



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD TO BE FULLY SODDED WITH 150mm TOPSOIL.
3. ROAD CROSSING DEPTHS FOR UTILITIES:
 -BELL 0.9m
 -GAS 1.0m
 -HYDRO 1.2m
4. STREET LIGHTS - CREE RSW LED LUMINAIRE MOUNTED ON STRESSCRETE CLASS C 9.14m DIRECT BURIED POLE AS PER TOWN STANDARDS.
5. WHERE SELECTED NATIVE SAND IS TO BE USED IN LIEU OF GRANULAR 'B' ROAD BASE, INCREASE GRANULAR 'A' THICKNESS TO 200mm.
6. IN AREAS OF HIGH GROUND WATER TABLE, AN INFILTRATING STORM SEWER SYSTEM MUST BE CONSIDERED PER ENGINEERING STANDARDS.
7. EASEMENTS FOR UTILITIES, FIRE PROTECTION AND SNOW STORAGE.
8. TRANSFORMERS INCLUDE 3m x 3m GROUND ROD GRID REQUIRING 0.3m MIN CLEARANCE FROM BACK OF CURB.
9. "NO PARKING - FIRE ROUTE" SIGNAGE SHALL BE INSTALLED ALONG THE NORTH OR WEST SIDE OF ROADWAY (SIDE WITH FIRE HYDRANTS).

TOWN OF WASAGA BEACH

STANDARD CROSS-SECTION
 MINIMUM MEDIUM DENSITY PRIVATE
 RESIDENTIAL DEVELOPMENT ROAD
 ON 8.0m CORRIDOR

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP

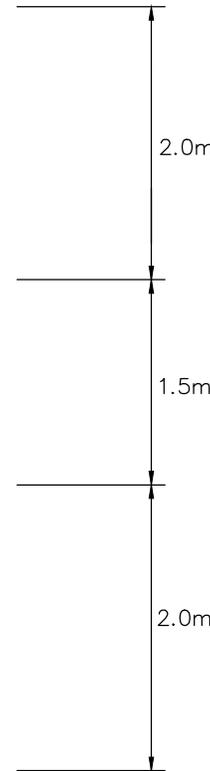
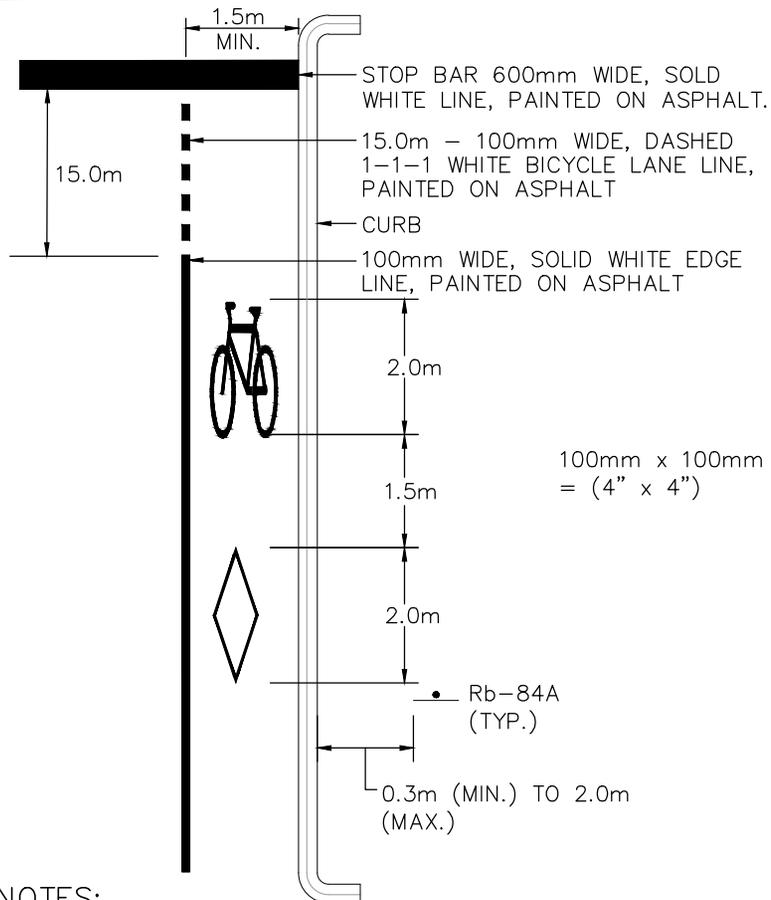
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CHECKED: MJP

DATE: APRIL 2021



STD.DWG.No.2G



Rb-84A
(60cm x 60 cm)



Rb-84t
(20 cm x 60 cm)
(SEE NOTE 3)

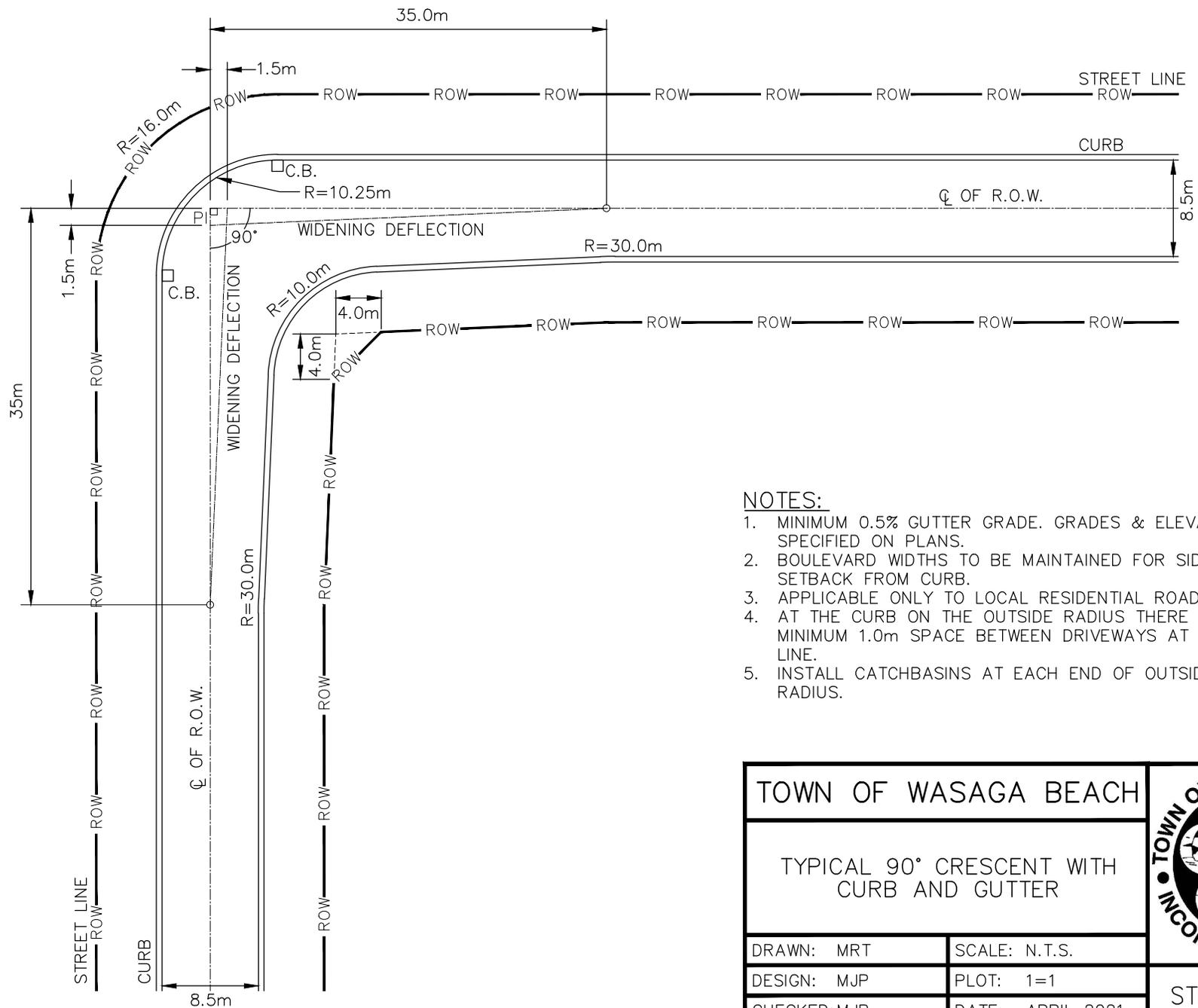


Rb-85t
(20 cm x 60 cm)
(SEE NOTE 4)

NOTES:

1. SIGNAGE TO CONFORM WITH THE ONTARIO TRAFFIC MANUAL BOOK 18, TOGETHER WITH THESE SPECIFICATIONS.
2. PAVEMENT MARKING SYMBOLS AND SIGNAGE TO BE REPEATED AT 300m INTERVALS, STRATEGICALLY PLACED AFTER INTERSECTIONS, AND AT THE START AND END OF BICYCLE LANES.
3. GROUND MOUNTED RESERVED BICYCLE LANE SIGN Rb-84A PROVIDED ALONG WITH RESERVED LANE "BEGINS" TAB (Rb-84t) BELOW, AT THE START OF BICYCLE LANES.
4. GROUND MOUNTED RESERVED BICYCLE LANE SIGN Rb-84A PROVIDED ALONG WITH RESERVED LANE "ENDS" TAB (Rb-85t) BELOW AT THE END OF BICYCLE LANES.
5. SIGNAGE HEIGHT 1.5m MIN. TO 2.5m MAX. MOUNTED ON U-FLANGE GALVANIZED STEEL POST OR SQUARE STEEL POSTS WITH BREAKAWAY SLEEVES ON HARD SURFACES.
6. FOR EXISTING RURAL ROADS, PAVED SHOULDERS MAY BE USED BY CYCLISTS UNDER THE HIGHWAY TRAFFIC ACT. RECOMMENDED MIN. WIDTH IS 1.2m PER THE ONTARIO TRAFFIC MANUAL BOOK 18.
7. FOR ROADS WITH PAVED SHOULDERS ALONG A DESIGNATED BICYCLE ROUTE, "BICYCLE ROUTE MARKER" SIGNS (OTM BOOK 5) SHOULD BE INSTALLED EVERY 400m TO 800m PER THE ONTARIO TRAFFIC MANUAL BOOK 18.

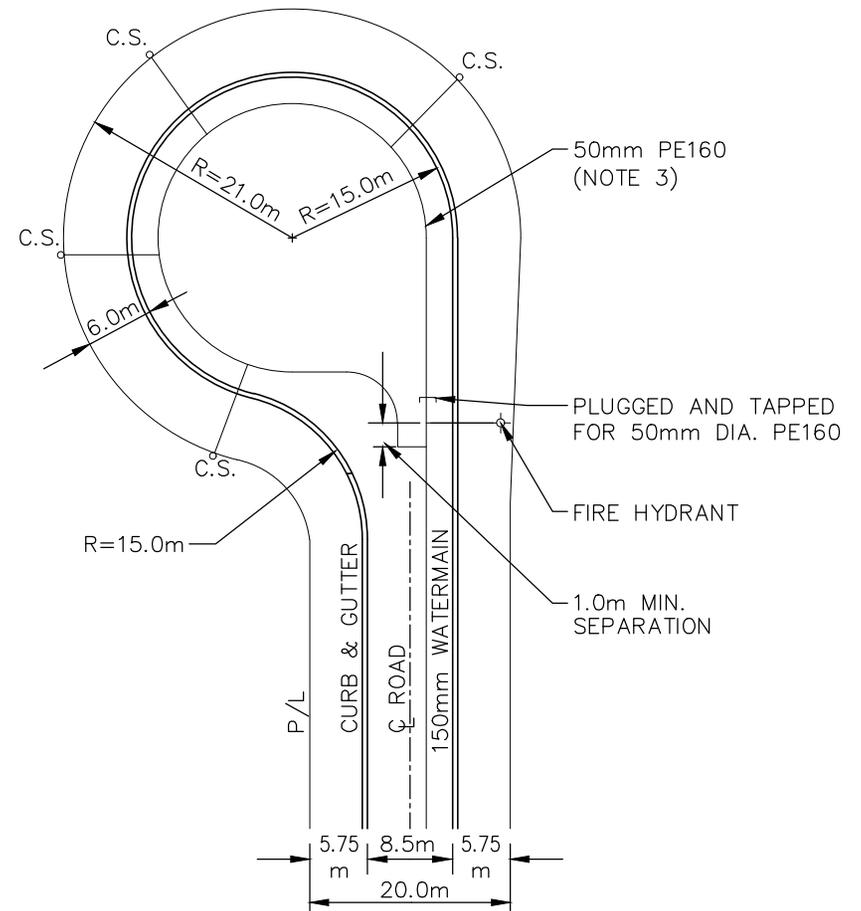
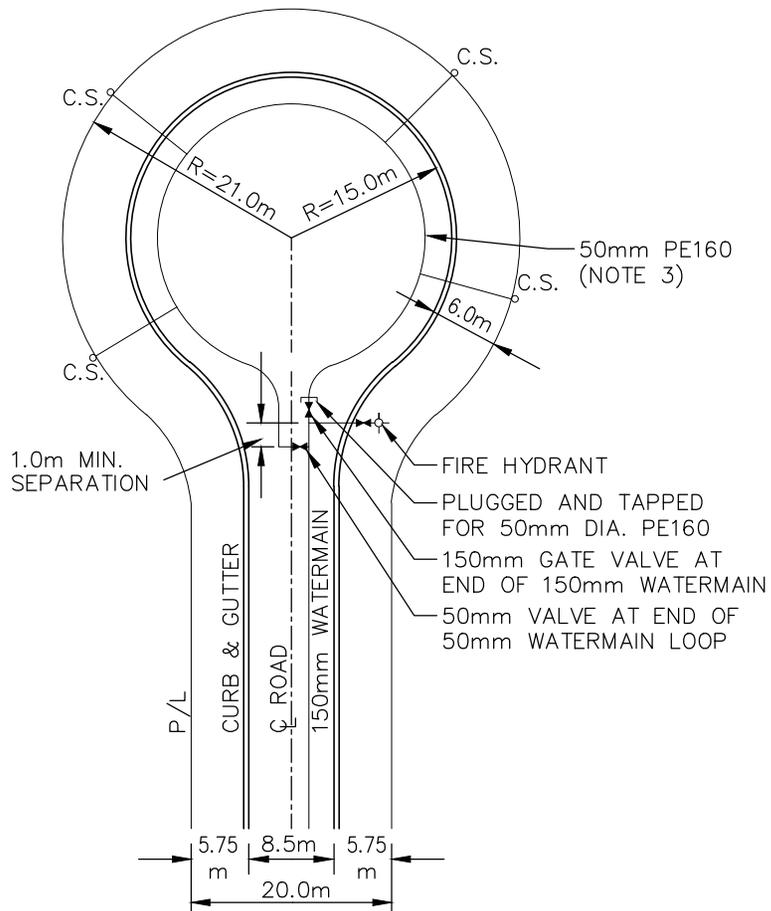
TOWN OF WASAGA BEACH		
BICYCLE LANE DETAILS		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.3
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. MINIMUM 0.5% GUTTER GRADE. GRADES & ELEVATIONS TO BE SPECIFIED ON PLANS.
2. BOULEVARD WIDTHS TO BE MAINTAINED FOR SIDEWALK SETBACK FROM CURB.
3. APPLICABLE ONLY TO LOCAL RESIDENTIAL ROADS.
4. AT THE CURB ON THE OUTSIDE RADIUS THERE SHALL BE A MINIMUM 1.0m SPACE BETWEEN DRIVEWAYS AT PROPERTY LINE.
5. INSTALL CATCHBASINS AT EACH END OF OUTSIDE CURB RADIUS.

TOWN OF WASAGA BEACH		
TYPICAL 90° CRESCENT WITH CURB AND GUTTER		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.4
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTE:

1. GUTTER GRADES TO BE SPECIFIED ON PLANS. MINIMUM GRADE ALONG GUTTER TO BE 0.50%
2. MINIMUM 2 CATCHBASINS TO BE PROVIDED IN CUL-DE-SAC
3. MINIMUM OF 4 RESIDENTIAL WATER SERVICES ARE REQUIRED ON THE 50mm DIA. LOOPED WATERMAIN

TOWN OF WASAGA BEACH

TYPICAL CUL-DE-SAC c/w
CURB & GUTTER AND TYPICAL
WATER SERVICING

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP

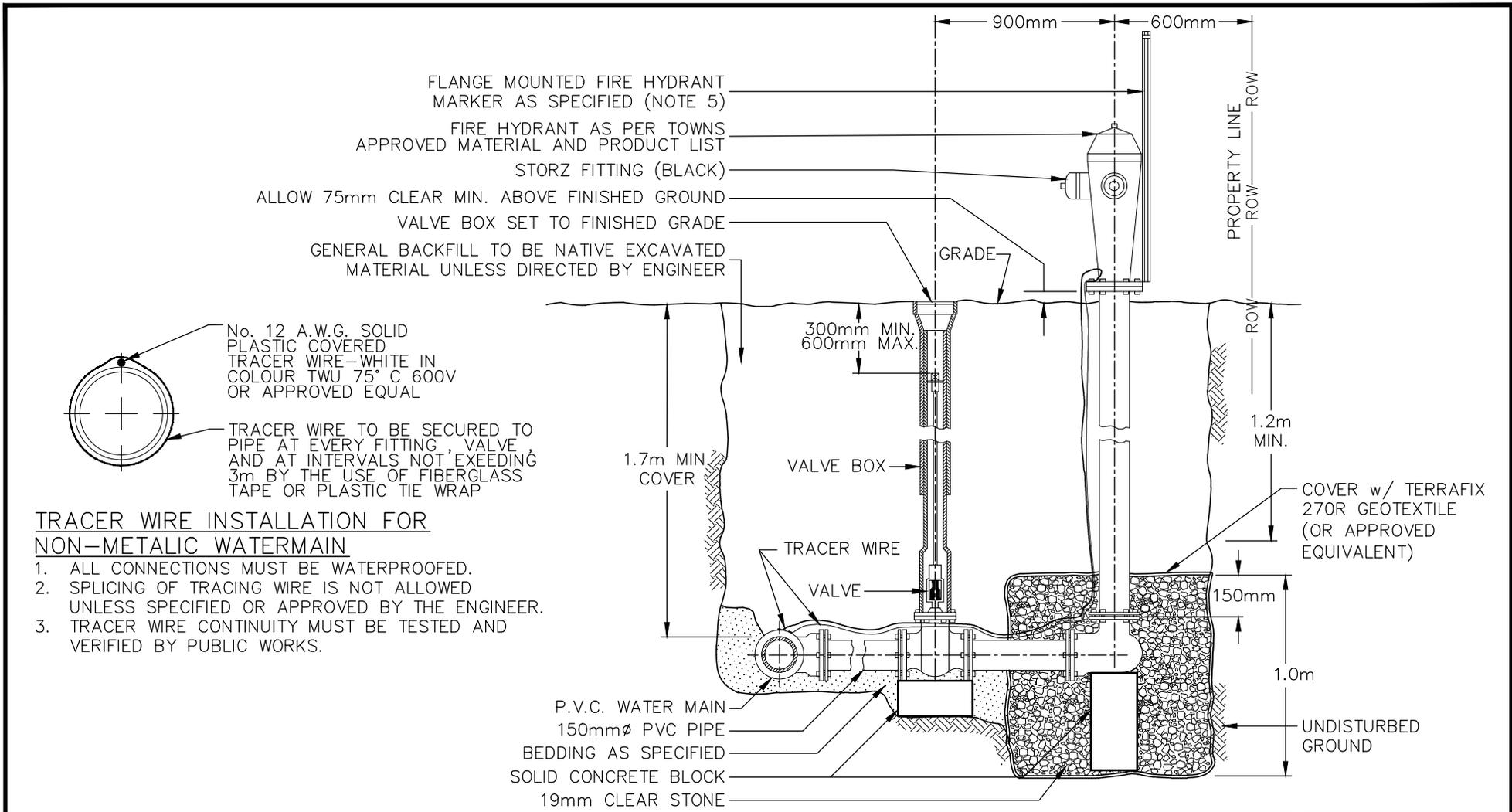
PLOT: 1=1

CHECKED: MJP

DATE: APRIL 2021



STD.DWG.No.5



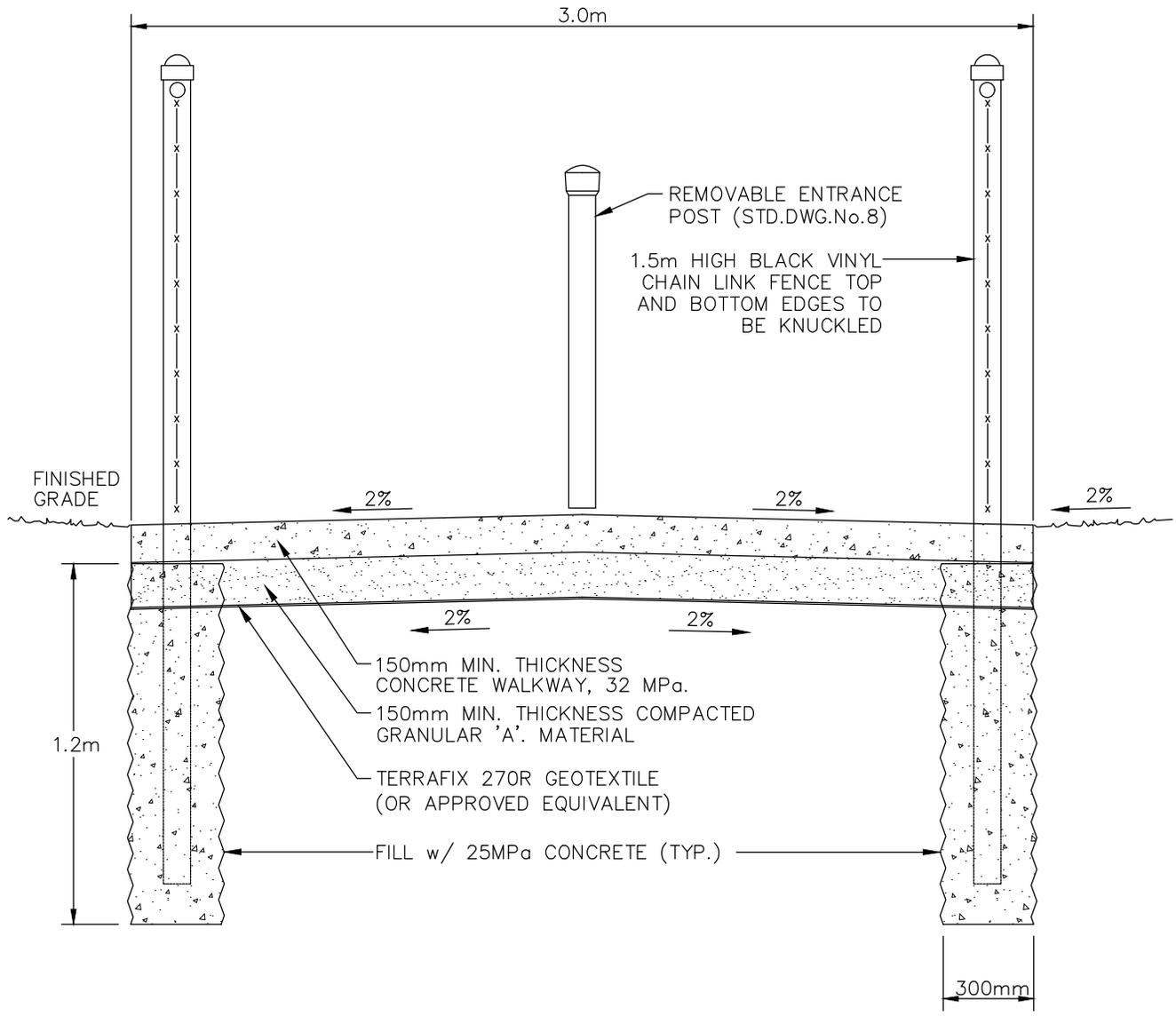
TRACER WIRE INSTALLATION FOR NON-METALIC WATERMAIN

1. ALL CONNECTIONS MUST BE WATERPROOFED.
2. SPLICING OF TRACING WIRE IS NOT ALLOWED UNLESS SPECIFIED OR APPROVED BY THE ENGINEER.
3. TRACER WIRE CONTINUITY MUST BE TESTED AND VERIFIED BY PUBLIC WORKS.

NOTES:

1. VALVE EXTENSION REQUIRED WHEN DISTANCE FROM TOP OF VALVE TO FINISHED GRADE IS GREATER THAN 1.7m.
2. ALL JOINTS TO BE MECHANICALLY RESTRAINED PER SECTION (9.1).
3. ALL HYDRANTS TO BE NON-Self DRAINING. DRAIN HOLES TO BE PLUGGED INTERNALLY.
4. HYDRANTS INSTALLED ON RURAL ROADS MUST BE PROVIDED ACCESS WITH A MINIMUM 400mmØ CSP DRIVEWAY CULVERT C/W HEADWALLS, WITH MINIMUM LENGTH OF 4.0m ON LOCAL ROADS, 6.0m ON MAJOR ROADS.
5. HYDRANT MARKERS SHALL BE FLANGE MOUNTED FLEXSTAKE FH800 SERIES AMERICAN, YELLOW, 1.8m LENGTH, MOUNTED ON BACK FLANGE NUT. COMPLETE WITH STANDARD HYDRANT SYMBOL AT TOP OF MARKER AND HIGH VISIBILITY GREEN REFLECTIVE STRIPING AROUND THE MARKER, UNDER THE HYDRANT SYMBOL.

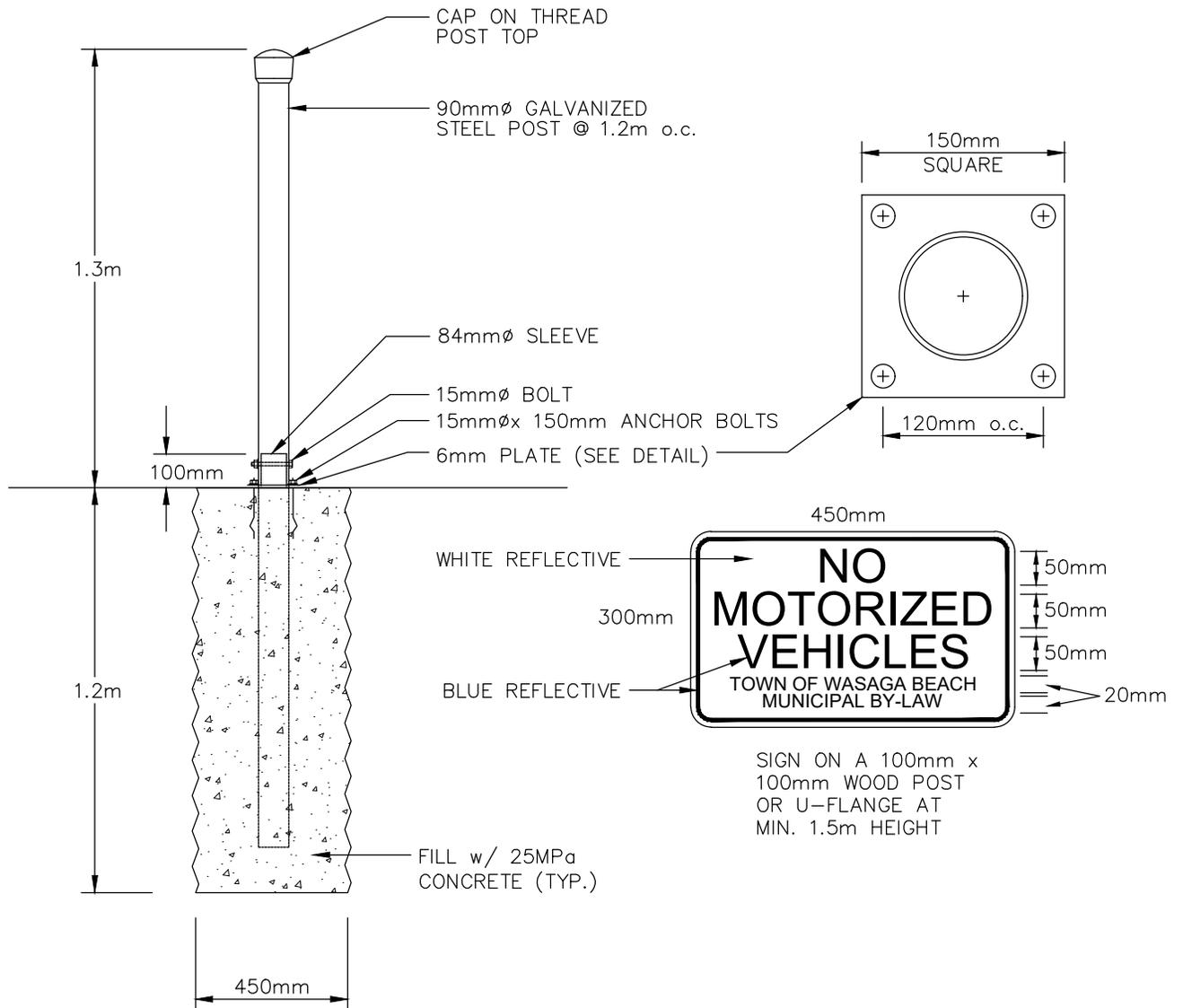
TOWN OF WASAGA BEACH		
HYDRANT AND VALVE DETAIL		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.6
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. (BLACK VINYL) CHAIN LINK FENCE WITH TOP RAIL TO OPSS 541. SEE OPSD 972.130 FOR ADDITIONAL DETAILS. HEIGHT OF 1.5m.
2. CONCRETE WALKWAY TO BE OPSS 351, 32MPa CONCRETE. SEE OPSD 310.010 FOR ADDITIONAL DETAILS. EXPANSION JOINTS ON WALKWAY TO BE AT 6.0m SPACING. DUMMY JOINTS AT 1.5m INTERVALS.
3. A MINIMUM OF 1% AND MAXIMUM OF 5% GRADE MUST BE MAINTAINED ALONG WALKWAYS.
4. DRAINAGE OUTLETS ARE TO BE PROVIDED AS REQUIRED BY PUBLIC WORKS.
5. REMOVABLE POST TO BE PLACED AT ENTRANCE APPROACH OR EQUIVALENT.

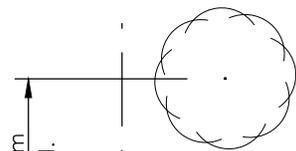
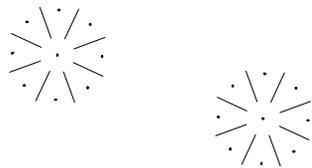
TOWN OF WASAGA BEACH		
WALKWAY TYPICAL CROSS-SECTION		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MJP	PLOT: 1=1	STD.DWG.No.7
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. GALVANIZED STEEL POST 3.16mm (1/8") WALL THICKNESS.
2. ALL OTHER METAL TO BE PAINTED WITH GALVANIC PAINT.
3. CONCRETE BASE TO BE 25MPa w/ 7.5% AIR ENTRAINMENT.
4. LOCATION TO BE CONFIRMED IN THE FIELD.

TOWN OF WASAGA BEACH		
REMOVABLE ENTRANCE POST		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MJP	PLOT: 1=1	STD.DWG.No.8
CHECKED:MJP	DATE: APRIL 2021	



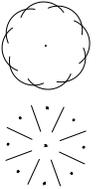
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S T R E E T

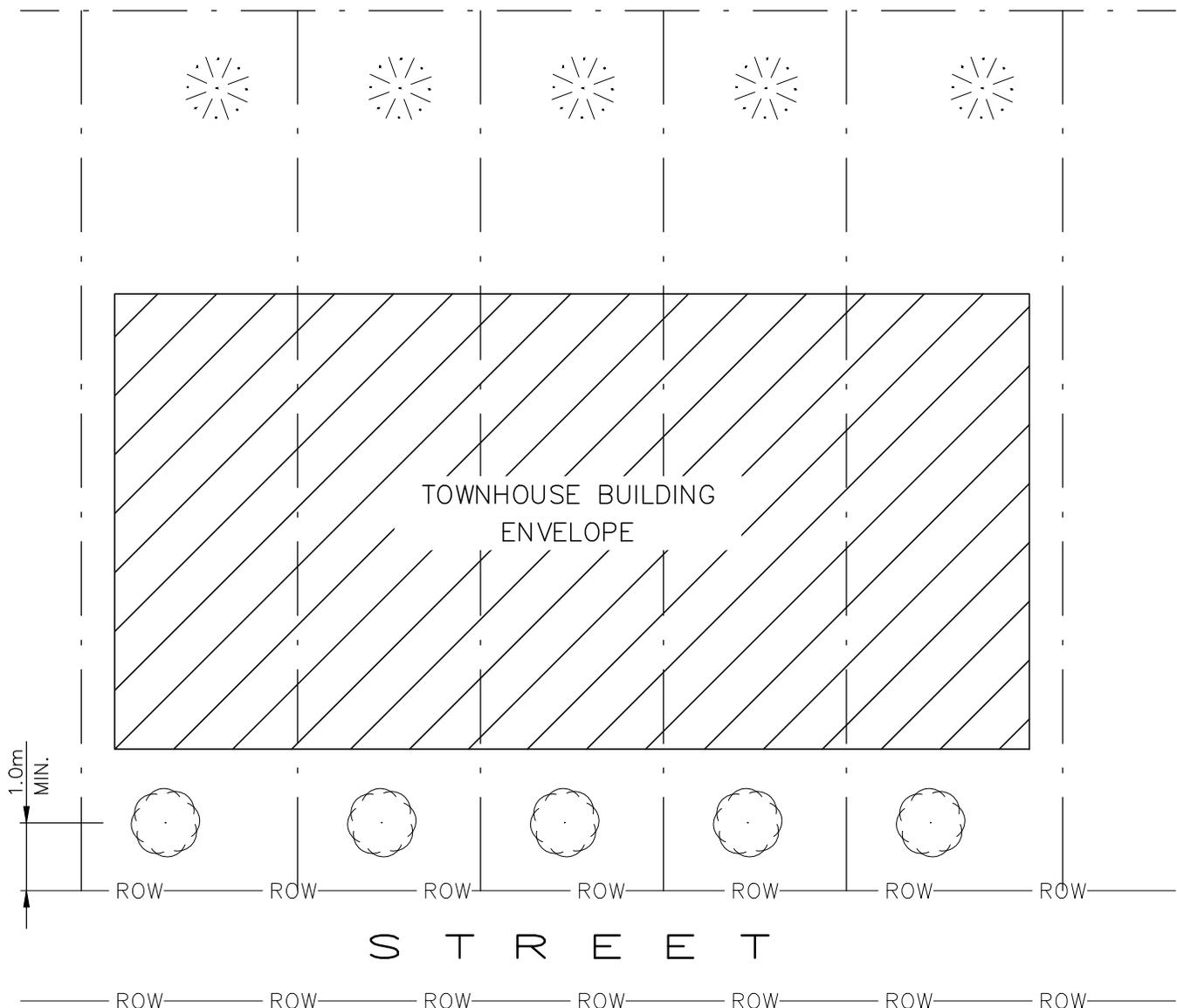
ROW — ROW — ROW — ROW — ROW

NOTES:

1. LOCATION OF TREE PLANTINGS TO BE DETERMINED AT TIME OF PLANTING IN CONSULTATION WITH MUNICIPAL STAFF AND IN CONFORMANCE WITH THE ACCEPTED FOR CONSTRUCTION LANDSCAPE PLANS
2. CONTRACTOR TO PRESERVE EXISTING TREES WHERE POSSIBLE.
3. MINIMUM THREE TREES TO BE PLANTED ON EACH LOT. (MINIMUM OF ONE HARDWOOD VARIETY ON FRONT LOT.)
4. HARDWOOD TREES SHALL BE: 50mm CALIPER @ 1.2m FROM BOTTOM OF TRUNK, MINIMUM HEIGHT OF 2.5m AND CONSISTENT WITH THE TOWN APPROVED SPECIES LIST.
5. SOFTWOOD TREES SHALL BE: A MINIMUM HEIGHT OF 1.5m AND CONSISTENT WITH THE TOWN APPROVED SPECIES LIST.
6. TREE PLANTINGS TO BE REVIEWED ON A CASE BY CASE BASIS, TO THE SATISFACTION OF THE TOWN WITH CONSIDERATION FOR PRESERVING EXISTING TREES, ETC.



TOWN OF WASAGA BEACH		
TYPICAL LOW DENSITY RESIDENTIAL LOT TREE PLANTING		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.9A
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	

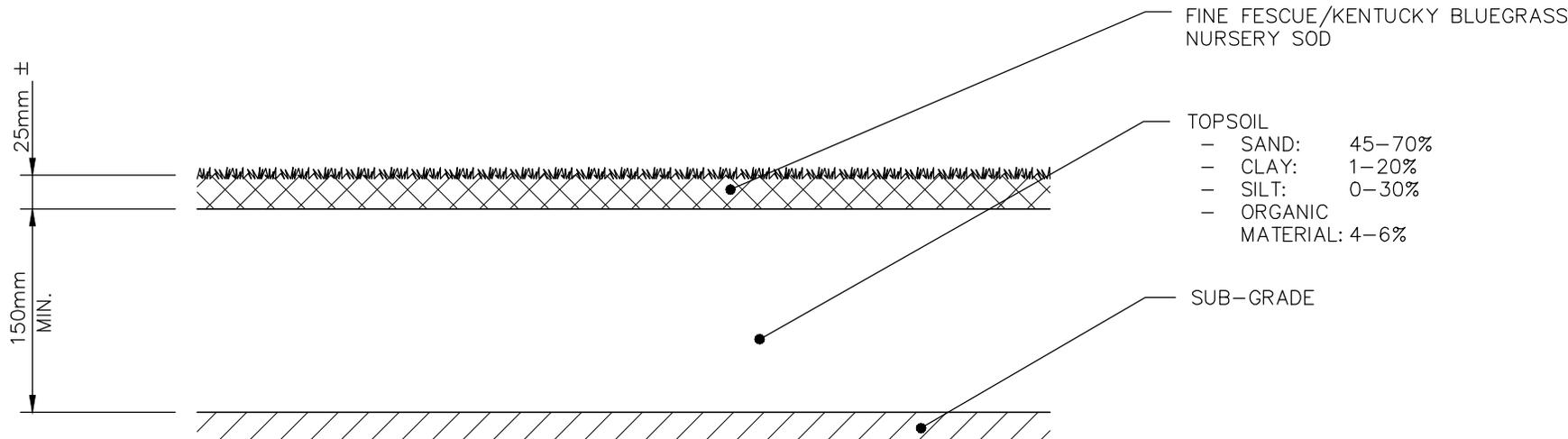


NOTES:

1. LOCATION OF TREE PLANTINGS TO BE DETERMINED AT TIME OF PLANTING IN CONSULTATION WITH MUNICIPAL STAFF AND IN CONFORMANCE WITH THE ACCEPTED FOR CONSTRUCTION LANDSCAPE PLANS
2. CONTRACTOR TO PRESERVE EXISTING TREES WHERE POSSIBLE.
3. MINIMUM TWO TREES TO BE PLANTED ON EACH LOT. (MINIMUM OF ONE HARDWOOD VARIETY PER LOT.)
4. HARDWOOD TREES SHALL BE: 50mm CALIPER @ 1.2m FROM BOTTOM OF TRUNK, MINIMUM HEIGHT OF 2.5m AND CONSISTENT WITH THE TOWN APPROVED SPECIES LIST.
5. SOFTWOOD TREES SHALL BE: A MINIMUM HEIGHT OF 1.5m AND CONSISTENT WITH THE TOWN APPROVED SPECIES LIST.
6. TREE PLANTINGS TO BE REVIEWED ON A CASE BY CASE BASIS, TO THE SATISFACTION OF THE TOWN WITH CONSIDERATION FOR PRESERVING EXISTING TREES, ETC.



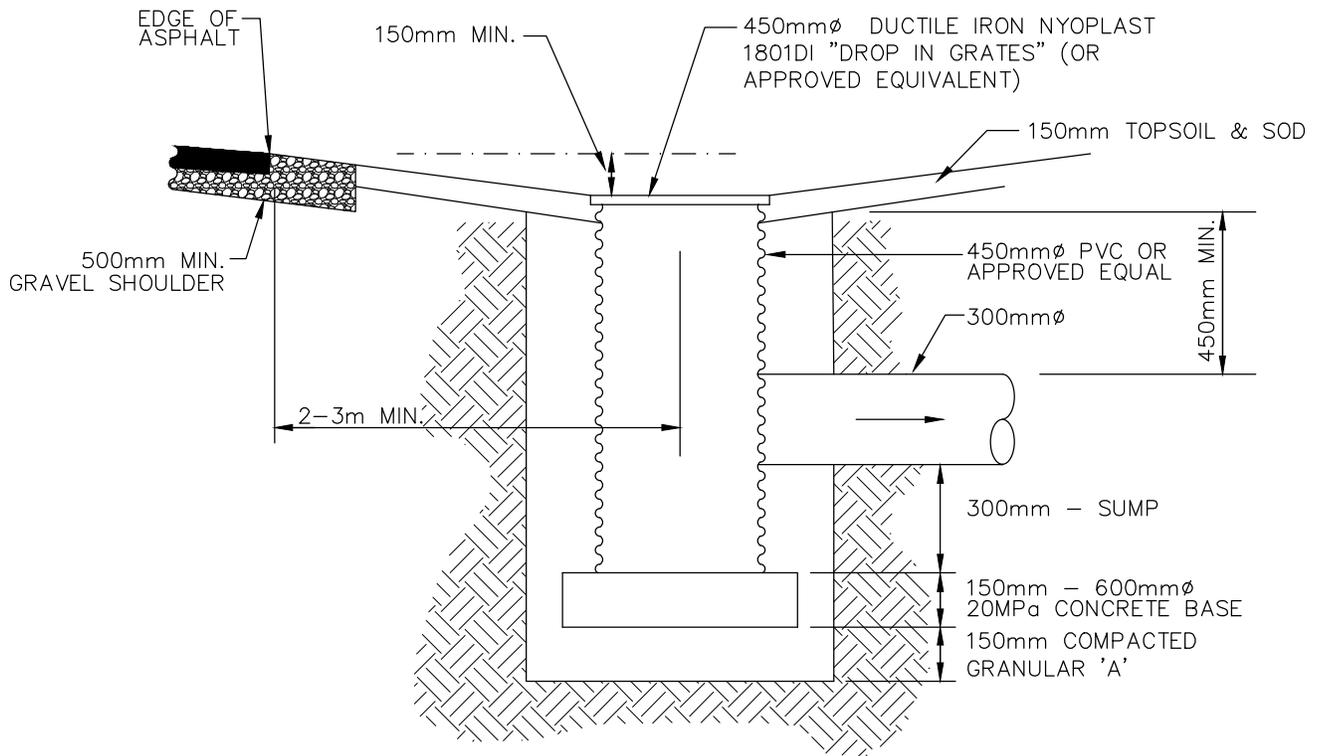
TOWN OF WASAGA BEACH		
TYPICAL MEDIUM DENSITY RESIDENTIAL LOT TREE PLANTING		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MJP	PLOT: 1=1	STD.DWG.No.9B
CHECKED:MJP	DATE: APRIL 2021	



NOTES:

1. SOD MUST BE FINE FESCUE/KENTUCKY BLUEGRASS AS SPECIFIED BY THE NURSERY SOD GROWERS ASSOCIATION OF ONTARIO.
2. TOPSOIL MUST BE TESTED AND AN AGRONOMY REPORT PREPARED BY AN ACCREDITED LABORATORY CONFIRMING THE SUITABILITY OF THE TOPSOIL AND RECOMMENDATIONS FOR FERTILIZATION.
3. TOPSOIL MUST BE COMPLETELY CLEAR OF ALL STONES IN EXCESS OF 25mm, DEBRIS, AND WOODY MATERIAL.
4. THE SUB-GRADE MUST BE GRADED TO ENSURE CONSISTENT TOPSOIL THICKNESS AND PROVIDE POSITIVE SURFACE DRAINAGE.
5. A PRE-SOD INSPECTION IS RECOMMENDED TO BE COMPLETED BY THE TOWN ENGINEER PRIOR TO THE PLACEMENT OF TOPSOIL.

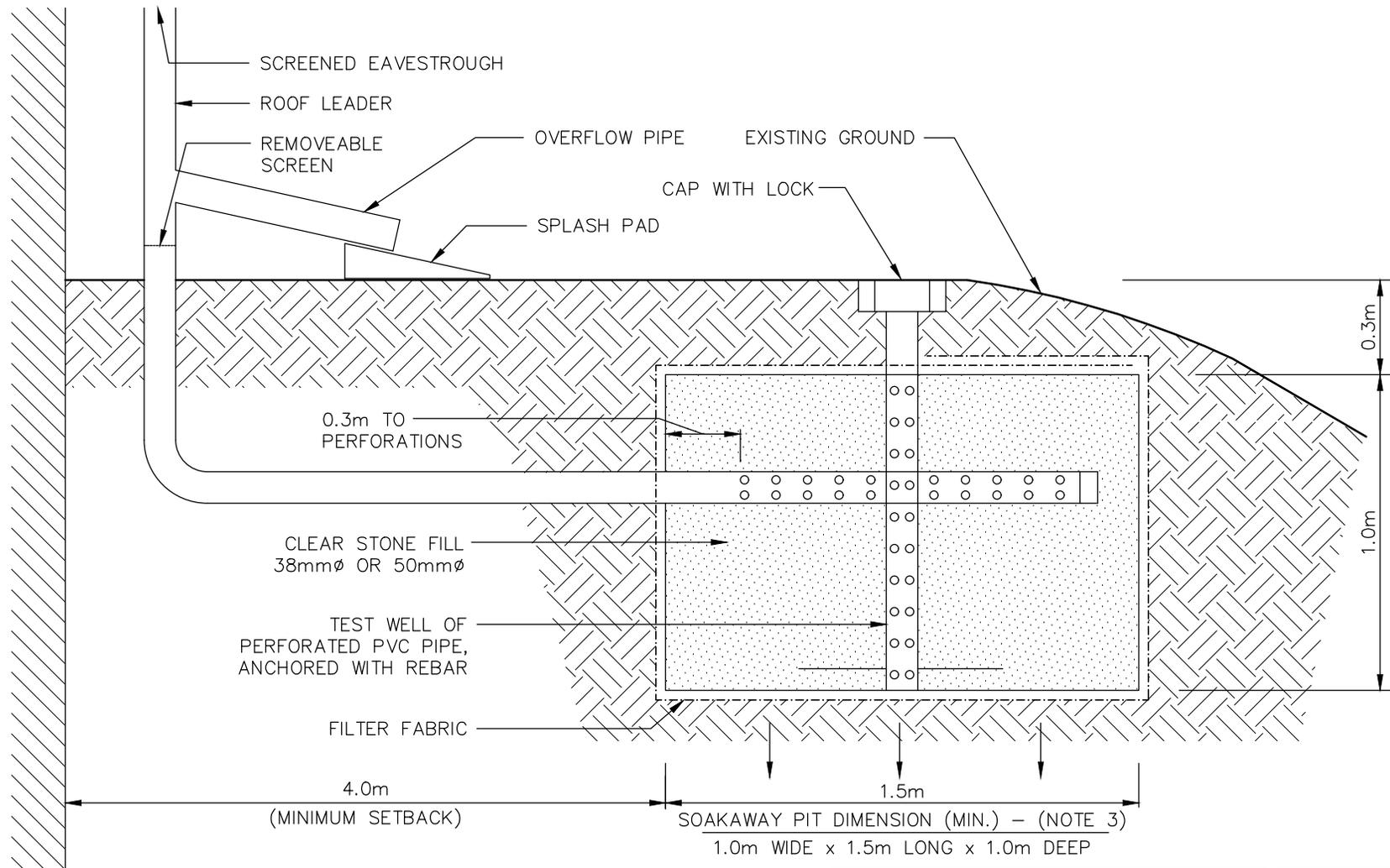
TOWN OF WASAGA BEACH		
TOPSOIL & SOD REQUIREMENTS		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.9C
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. IN THE EVENT THAT THERE IS NO STORM SEWER COLLECTION SYSTEM, THE ABOVE MINIMUM GRADING SHALL BE PROVIDED FOR SURFACE WATER CONVEYANCE AND INFILTRATION.
2. A MINIMUM 1.0 X 1.0 X 3.0m SOAKAWAY PIT CONSISTING OF 50mm CLEAR STONE WRAPPED IN TERRAFIX 270R FILTER FABRIC MAY BE REQUIRED AS DEEMED NECESSARY BY THE TOWN ENGINEER.

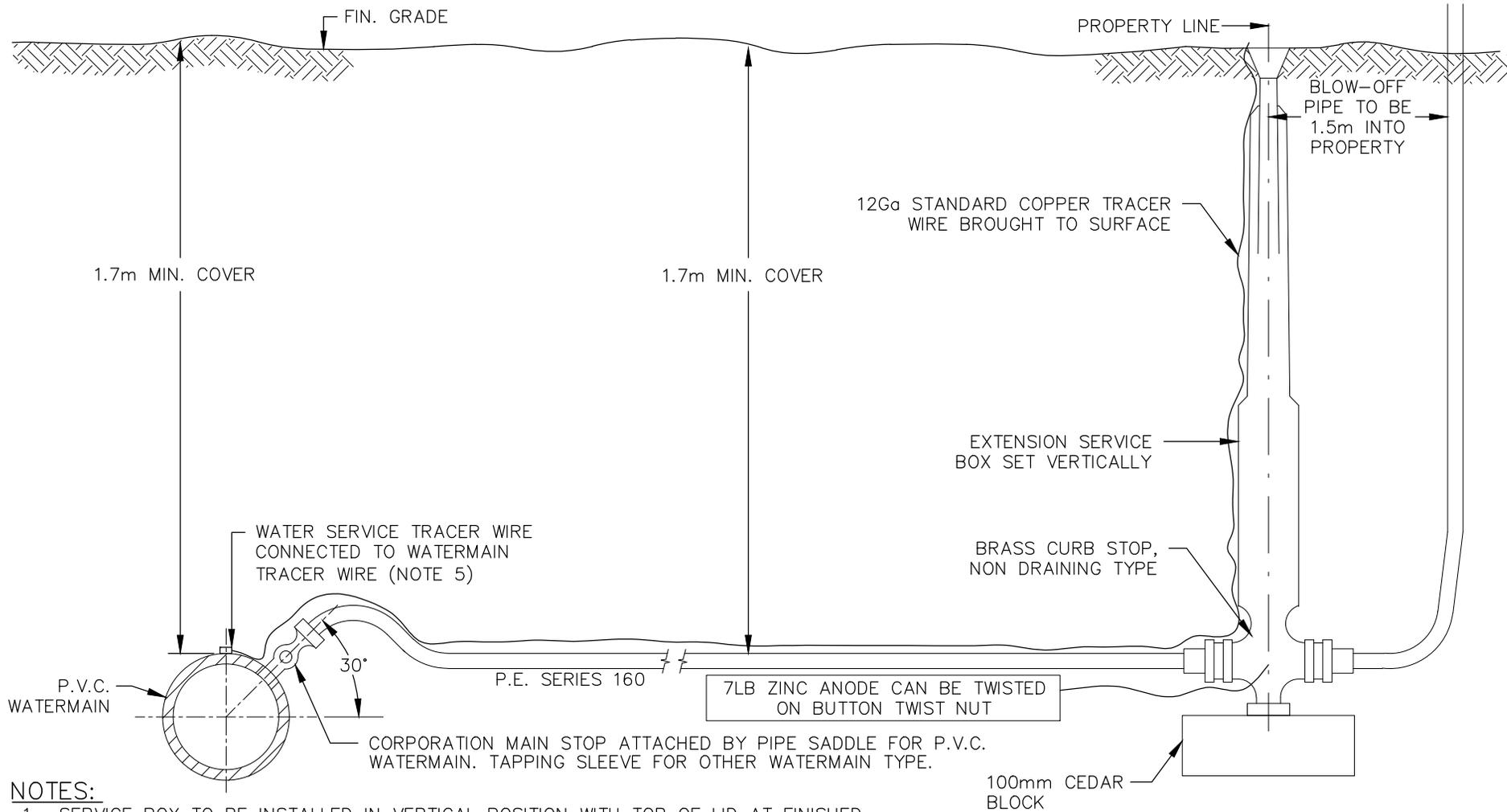
TOWN OF WASAGA BEACH		
OFF ROAD CATCHBASIN AND BOULEVARD GRADING DETAIL		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MJP	PLOT: 1=1	STD.DWG.No.10
CHECKED: MJP	DATE: APRIL 2021	



NOTE:

1. FILTER FABRIC TERRAFIX 270R OR EQUAL.
2. PROVIDE MINIMUM 0.5m CLEARANCE TO WATER TABLE FROM BOTTOM OF PIT.
3. SOAKAWAY PIT DIMENSIONS SHALL BE SIZED PER DESIGN ENGINEER RECOMMENDATION.
4. SOAKAWAY PIT TO BE INSPECTED BY DESIGN ENGINEER PRIOR TO BACKFILL.
5. SOAKAWAY PIT TO BE OFFSET A MINIMUM 4.0 METRES AWAY FROM BUILDING.
6. SOAKAWAY PIT TO BE OFFSET A MINIMUM 1.0 METRES AWAY FROM PROPERTY LINE.

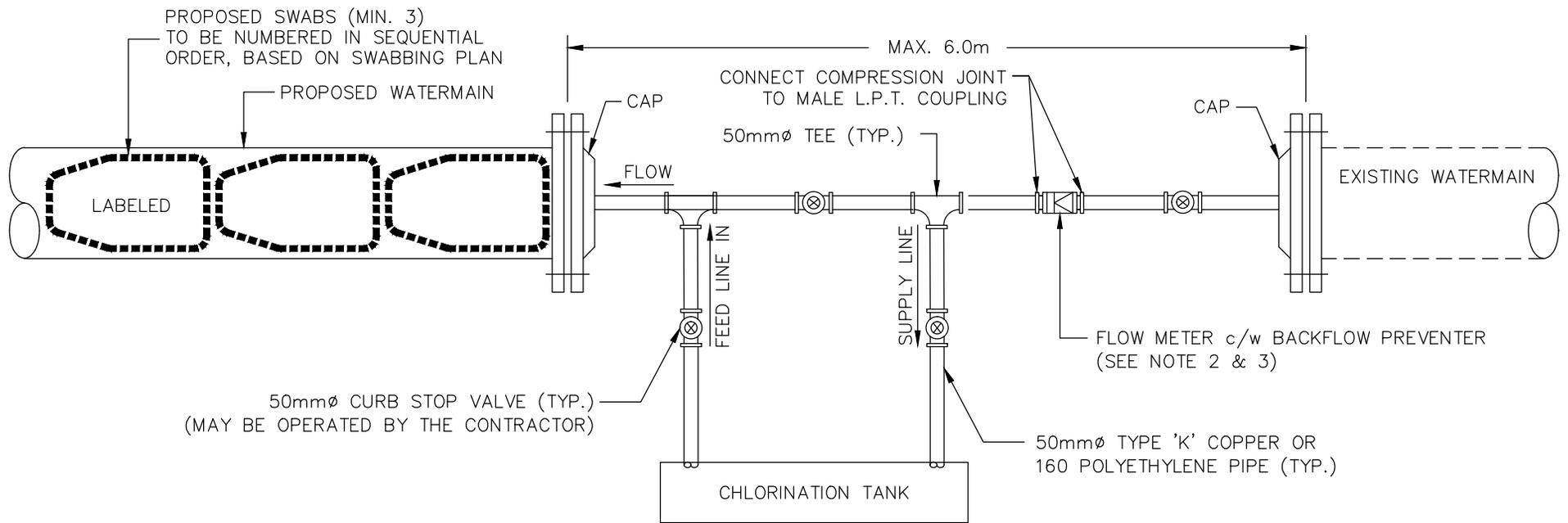
TOWN OF WASAGA BEACH		
ROOF LEADER SOAKAWAY PIT		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.11
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. SERVICE BOX TO BE INSTALLED IN VERTICAL POSITION WITH TOP OF LID AT FINISHED GRADE ELEVATION.
2. SERVICE CONNECTION TO BE 25mm ϕ FOR RESIDENTIAL LOTS – P.E. SERIES 160.
3. LOCATE SERVICE CONNECTION 1.0m MIN. OFF DRIVEWAYS AND 1.5m FROM SIDE PROPERTY LINE.
4. IF EXISTING WATER SERVICE COVER IS LESS THAN MINIMUM 1.7m, INSULATE FULL LENGTH AS PER DETAIL DRAWING.
5. WATER SERVICE TRACER WIRE (12Ga STANDARD COPER TRACER WIRE) TO BE CONNECTED TO WATERMAIN TRACER WIRE WITH WATERPROOF DIRECT BURY CONNECTING LUGS FOR BRANCH WIRE CONNECTION.
6. 7LB ZINC ANODE TO BE INSTALLED 1000mm FROM CURB STOP AS PER OPSS 442.
7. NO DIRECT TAPPING OF PVC WATERMAINS. ALL CONNECTIONS TO PVC PIPE TO BE MADE USING AN APPROVED WIDE-BAND SERVICE SADDLE.
8. WATER SERVICE TO BE A MIN. 1.7m UNDER THE BOTTOM OF DITCH OR INSULATE

TOWN OF WASAGA BEACH		
RESIDENTIAL WATER SERVICE CONNECTION DETAIL (25mm ϕ)		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.12B
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. INSULATION OF WATERMAIN BY-PASS SYSTEM, TO THE TOWN'S SATISFACTION, IS REQUIRED DURING FREEZING CONDITIONS
2. FLOW METER MAY BE PROVIDED BY PUBLIC WORKS (PENDING AVAILABILITY) OR ELSE SUPPLIED BY THE CONTRACTOR AS APPLICABLE.
3. BACKFLOW PREVENTER TO BE SUPPLIED AND TESTED BY A PLUMBER CERTIFIED IN BACK-FLOW PREVENTION. CERTIFICATION SHALL BE WITNESSED BY THE DEVELOPER'S ENGINEER AND A COPY IS TO BE PROVIDED TO TOWN STAFF. IF THE BY-PASS SYSTEM IS REMOVED AND REINSTALLED, IT MUST BE RE-CERTIFIED.

TOWN OF WASAGA BEACH

WATER DISTRIBUTION SYSTEM
50mm TEST POINT BY-PASS
SCHEMATIC



DRAWN: MRT

SCALE: N.T.S.

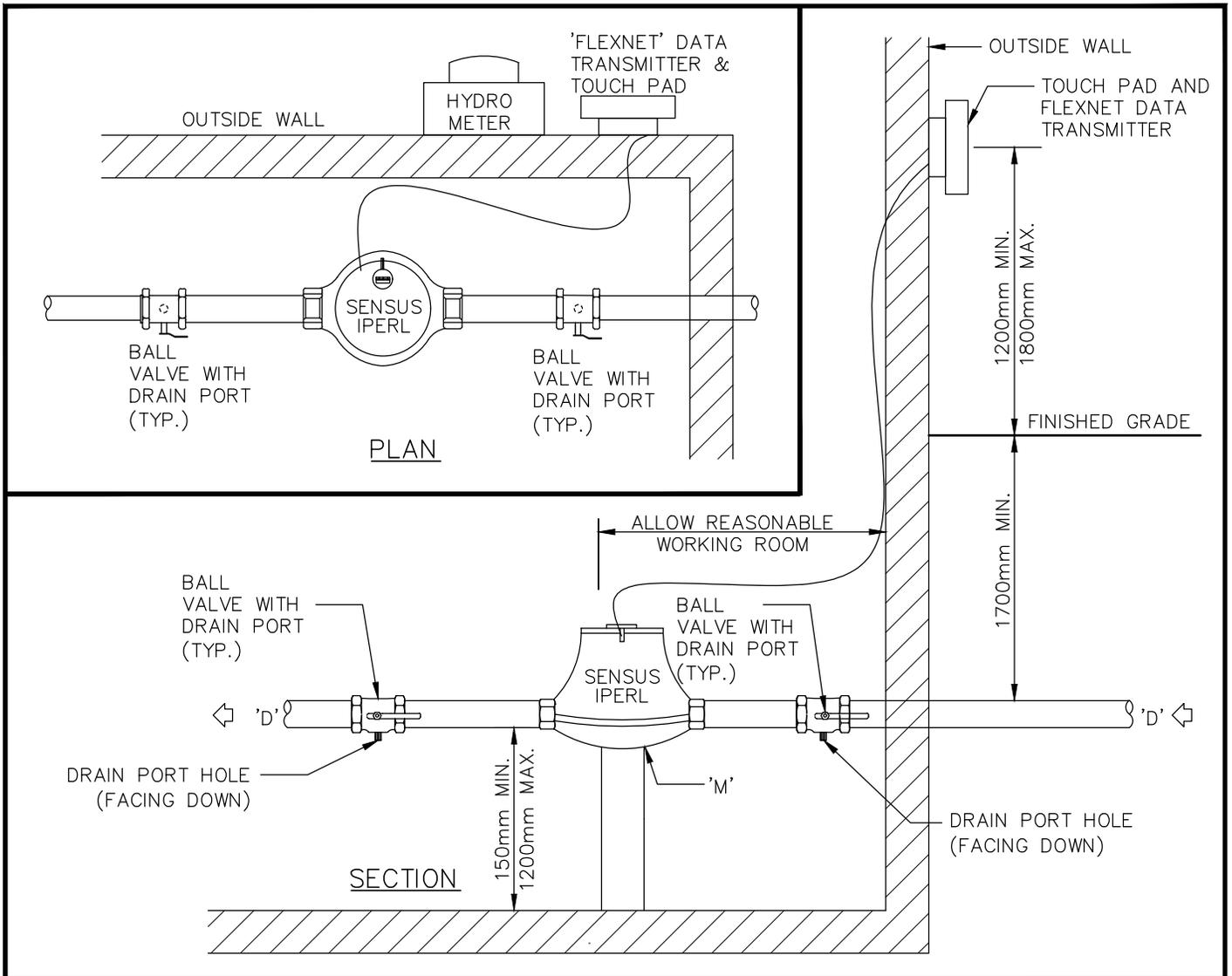
DESIGN: MJP

PLOT: 1=1

CHECKED: MJP

DATE: APRIL 2021

STD.DWG.No.13



* AFTER WATER METER PACKAGE INSTALLATION IS COMPLETE/INSPECTED, THE OWNER/INSTALLER IS RESPONSIBLE TO CONTACT PUBLIC WORKS DEPT. TO CO-ORDINATE INSTALLATION OF THE 'FLEXNET' DATA TRANSMITTER PH. No. (705) 429-2540

NOTES:

1. DATA TRANSMITTER TO BE LOCATED ADJACENT TO THE HYDRO ELECTRIC METER.
2. METERS SHALL BE INSTALLED IN A HORIZONTAL POSITION.
3. ALL PIPE AND APPURTENANCES TO BE SIZED AS REQUIRED FOR SERVICE DIA. 'D'
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
5. METERS SHALL BE 'SENSUS' AS OUTLINED IN TABLE 1 BELOW c/w FLEXNET REMOTE TOUCH PAD & TRANSMITTER.
6. PROVIDE SUPPORT FOR THE METER AND RELATED COMPONENTS.
7. WORKING SPACE AROUND THE METER SHALL ALLOW MIN. 600mm ACCESS FOR MAINTENANCE PURPOSES.
8. ALL LAWN WATERING SYSTEMS SHALL INCLUDE A BACKFLOW PREVENTION DEVICE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND TOWN OF WASAGA BEACH STANDARDS.

TABLE 1

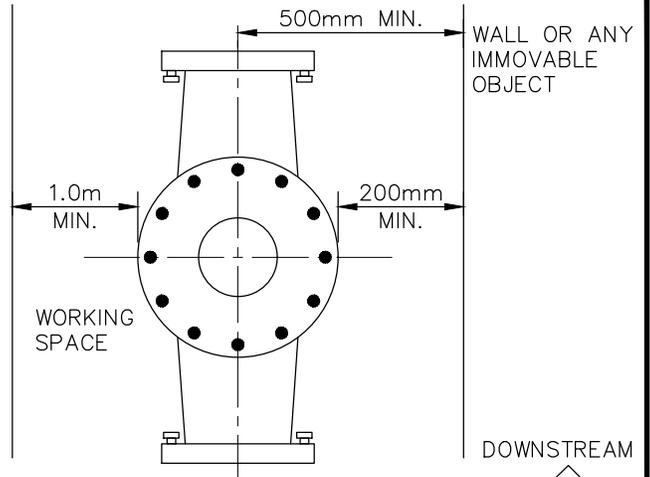
SERVICE 'D' (mm)	SENSUS METER SIZE 'M' (mm)	METER MODEL
19ø	EXISTING 19ø	IPERL
25ø	25ø	IPERL
38ø	38ø	OMNIR2
50ø	50ø	OMNIR2

*METER SIZE MAY CHANGE BASED ON DEMAND REQUIREMENTS

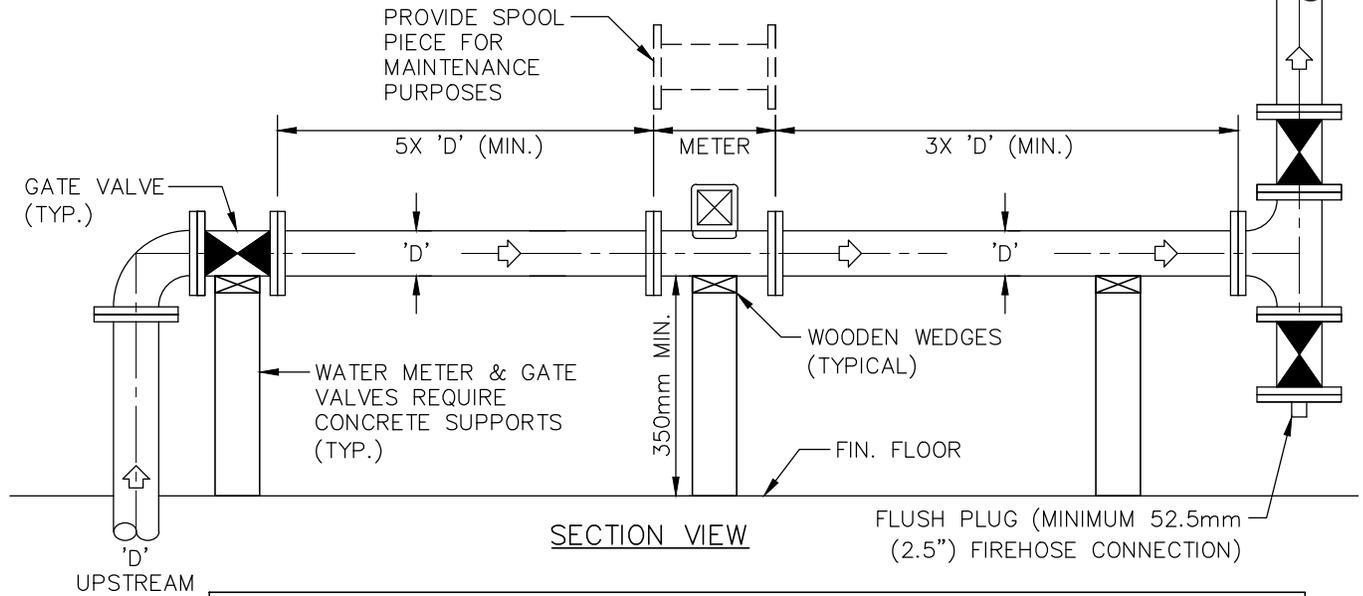
TOWN OF WASAGA BEACH		
TYPICAL WATER METER INSTALLATION 19mmø TO 50mmø		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MJP/GER	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	STD.DWG.No.14A

SERVICE ϕ 'D' (mm)	METER SIZE 'M' (mm)	SENSUS METER MODEL (SEE NOTE 4)	METER WIDTH
100	100	OMNI C2	508
150	150	OMNI C2	610
>150	SENSUS METER REQUIREMENTS AS SPECIFIED BY THE TOWN ENGINEER		

* A KEY TO THE MECHANICAL ROOM TO BE SUPPLIED TO THE TOWN OF WASAGA BEACH FOR METER MAINTENANCE.



TOP VIEW OF METER



SECTION VIEW

* AFTER WATER METER PACKAGE INSTALLATION IS COMPLETE/INSPECTED, THE OWNER/INSTALLER IS RESPONSIBLE TO CONTACT PUBLIC WORKS DEPT. TO CO-ORDINATE INSTALLATION OF THE 'FLEXNET' DATA TRANSMITTER PH. No. (705) 429-2540

NOTES:

1. VALVES TO BE INSPECTED BY THE TOWN OF WASAGA BEACH.
2. ALL PIPE AND APPURTENANCES TO BE SIZED AS REQUIRED FOR SERVICE DIA. 'D'
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
4. METERS SHALL BE SENSUS 'OMNI C2' TYPE c/w INTERNAL STRAINER AND/OR AS REQUIRED BY THE TOWN ENGINEER, c/w FLEXNET REMOTE TOUCH PAD & TRANSMITTER. FIRE SUPPLY LINE METERS SHALL BE 'OMNI F2' TYPE
5. WORKING SPACE AT THE METER SHALL BE A MINIMUM OF 2.0m IN HEIGHT.
6. ALL BUILDINGS WITH FIRE SPRINKLER SYSTEMS SHALL INSTALL A BACKFLOW PREVENTION DEVICE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE PART 7.
7. FOR OUTSIDE UNDERGROUND INSTALLATION REFER TO TOWN OF WASAGA BEACH STANDARD DWG No.15A.

TOWN OF WASAGA BEACH

TYPICAL WATER METER
INSTALLATION 100mm ϕ AND
GREATER WATER SERVICE

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP/GER

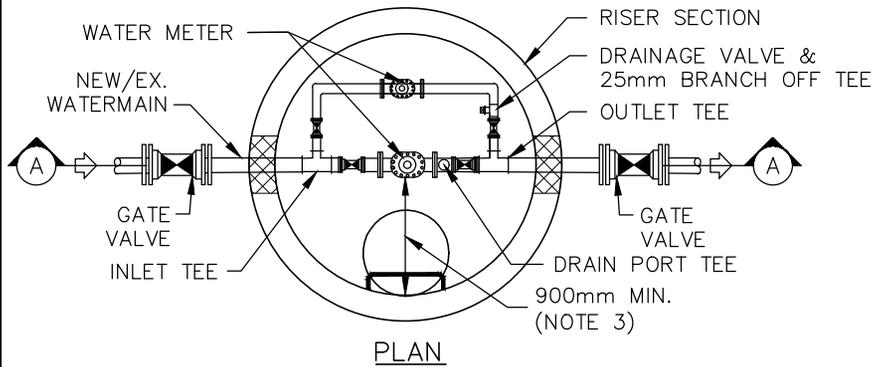
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CHECKED: MJP

DATE: APRIL 2021

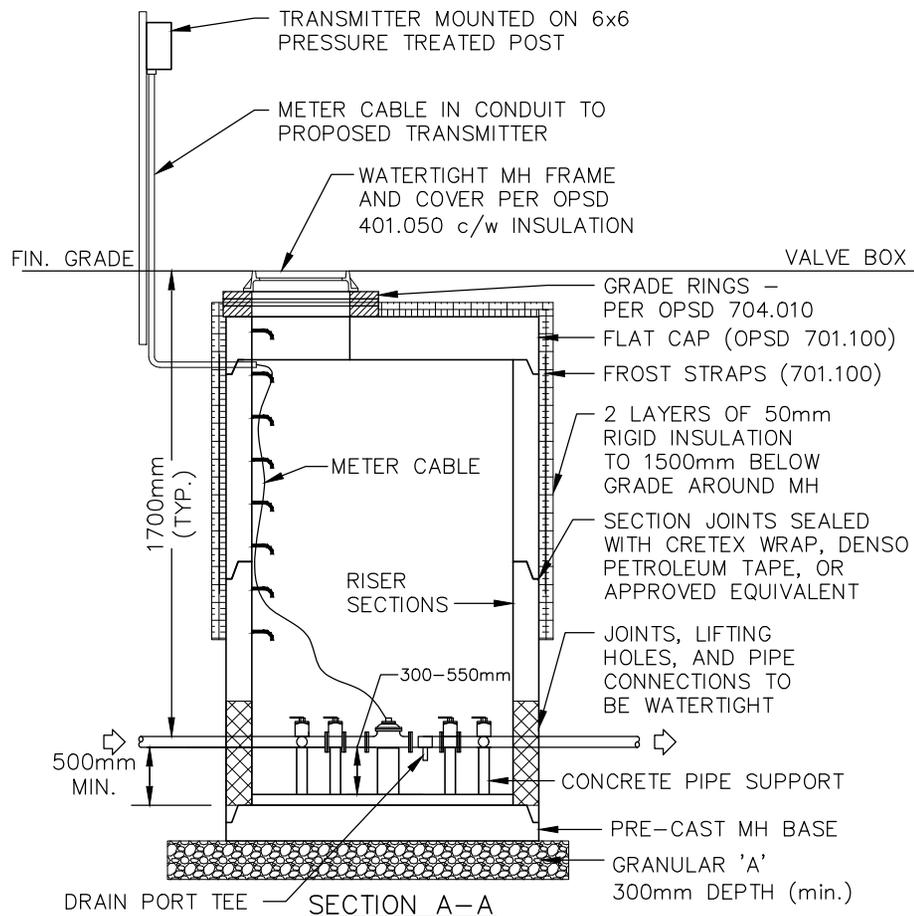


STD.DWG.No.14B



NOTES:

1. FOR WATER SERVICES SMALLER THAN 50mm ϕ , REFER TO OPSD 1107.010 AND THE TOWN APPROVED MATERIALS LIST FOR WATER METER PITS.
2. FOR WATER SERVICES 50mm TO 250mm ϕ REFER TO OPSD 1107.020.
3. WATER METERS SHALL BE INSTALLED WITH A MINIMUM 900mm UNOBSTRUCTED CLEARANCE IN FRONT OF WATER METER TO THE NEAREST WALL.
4. BY-PASS PIPING SHALL BE INSTALLED WITH A MINIMUM 300mm UNOBSTRUCTED CLEARANCE FROM THE OUTSIDE WALL OF THE BY-PASS PIPE TO THE NEAREST WALL.,
 - 4.A. A 75mm METER SHALL HAVE 75mm TO 100mm INCREASERS ON EACH SIDE
 - 4.B. BY-PASS LINE SIZE SHALL BE SAME SIZE AS THE METER LINE, COMPLETE WITH METER ON THE BY-PASS.
 - 4.C. ALL JOINTS SHALL BE RESTRAINED.
5. ACCESS CHAMBERS MUST BE PRE-CAST CONCRETE COMPONENTS CONFORMING TO OPSD 701.011, 701.013, AND 701.014. PRE-FABRICATED CHAMBERS PROVIDED BY DEVINE & ASSOCIATES LTD. ARE PREFERRED.
6. METERS SHALL BE 'OMNI C2' TYPE c/w INTERNAL STRAINER OR APPROVED EQUIVALENT. (c/w FLEXNET REMOTE TOUCHPAD & TRANSMITTER)
7. ADDITIONAL STRAINERS AS MAY BE REQUIRED BY THE TOWN ENGINEER.
8. CONCRETE PIPE SUPPORT REQUIRES BOND BREAKER BETWEEN PIPE AND SUPPORT.
9. METER SIZE AND MODEL AS PER TOWN OF WASAGA BEACH WATER METER INSTALLATION STANDARD DRAWINGS.
10. ALL PIPING/APPURTENANCES/CONSTRUCTION SHALL CONFORM TO CURRENT OPSS AND ONTARIO BUILDING CODE STANDARDS.
11. GRANULAR BACKFILL TO 98% SPMDD
12. OWNER TO PROVIDE A SPOOL PIECE ON SITE FOR METER REMOVAL AND MAINTENANCE.
13. ALL DIMENSIONS SHOWN ARE IN mm UNLESS OTHERWISE NOTED.
14. ALL HOLES AND PIPE CONNECTIONS TO BE MADE WATERTIGHT USING "LINK-SEAL" PIPE TO WALL PENETRATION SEALS OR APPROVED EQUIVALENT.



TOWN OF WASAGA BEACH

WATER METER CHAMBER

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP/GER

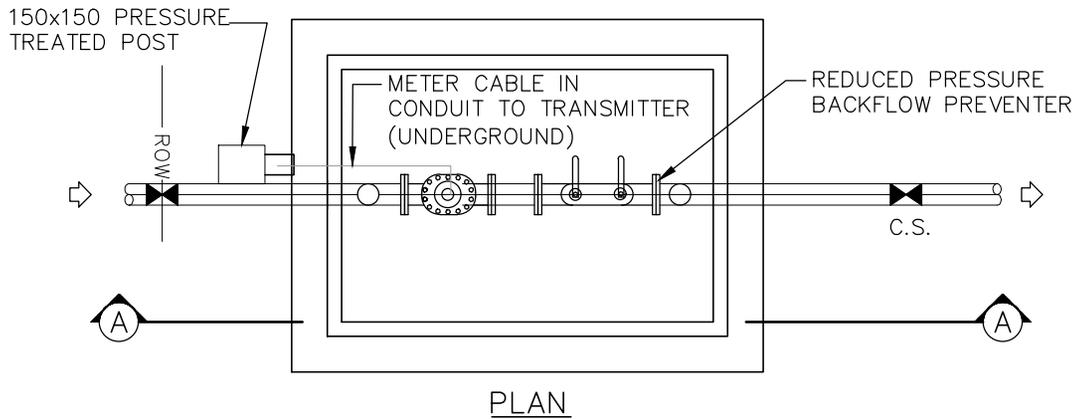
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CHECKED: MJP

DATE: APRIL 2021

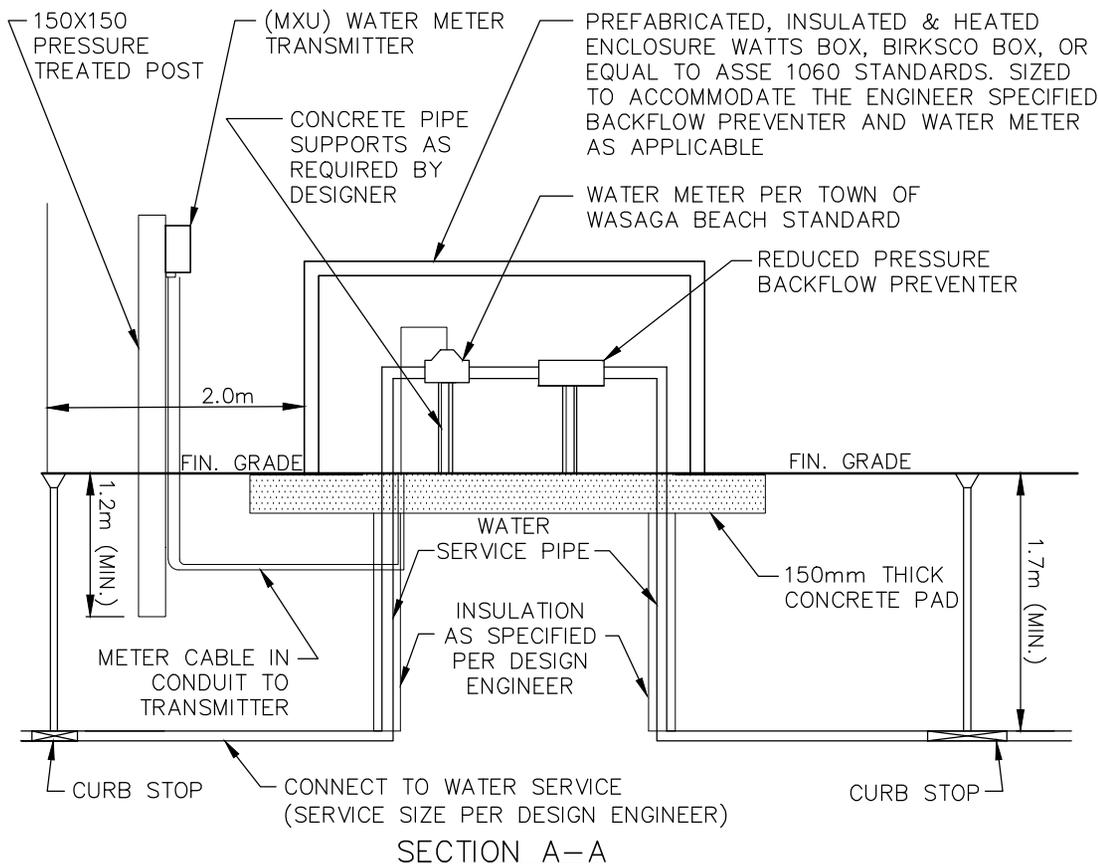


STD.DWG.No.15A



NOTES:

1. TO BE USED ONLY WHERE A BACKFLOW PREVENTER IS REQUIRED AND INSTALLATION WITHIN A BUILDING IS NOT POSSIBLE.
2. CONCRETE PIPE SUPPORTS REQUIRES BOND BREAKER BETWEEN PIPE AND SUPPORT.
3. METER SIZE AND MODEL AS PER TOWN OF WASAGA BEACH WATER METER INSTALLATION STANDARD DRAWINGS.
4. ALL PIPING/APPURTENANCES/CONSTRUCTION SHALL CONFORM TO CURRENT OPSS AND ONTARIO BUILDING CODE STANDARDS
5. OWNER TO PROVIDE A SPOOL PIECE ON SITE FOR METER REMOVAL AND MAINTENANCE.
6. ALL DIMENSIONS SHOWN ARE IN mm UNLESS OTHERWISE NOTED.
7. ALL HOLES AND PIPE CONNECTIONS TO BE MADE WATERTIGHT USING "LINK-SEAL" PIPE TO WALL PENETRATION SEALS OR APPROVED EQUIVALENT (WHERE APPLICABLE).
8. CHAMBER SIZES SHALL VARY FOR METER SIZES AS PER MANUFACTURERS SPECIFICATIONS AND TO THE SATISFACTION OF THE TOWN.



TOWN OF WASAGA BEACH

TYPICAL WATER METER CHAMBER WITH METER CHAMBER WITH BACKFLOW PREVENTER
38mmØ TO 250mmØ METER SIZE

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP/GER

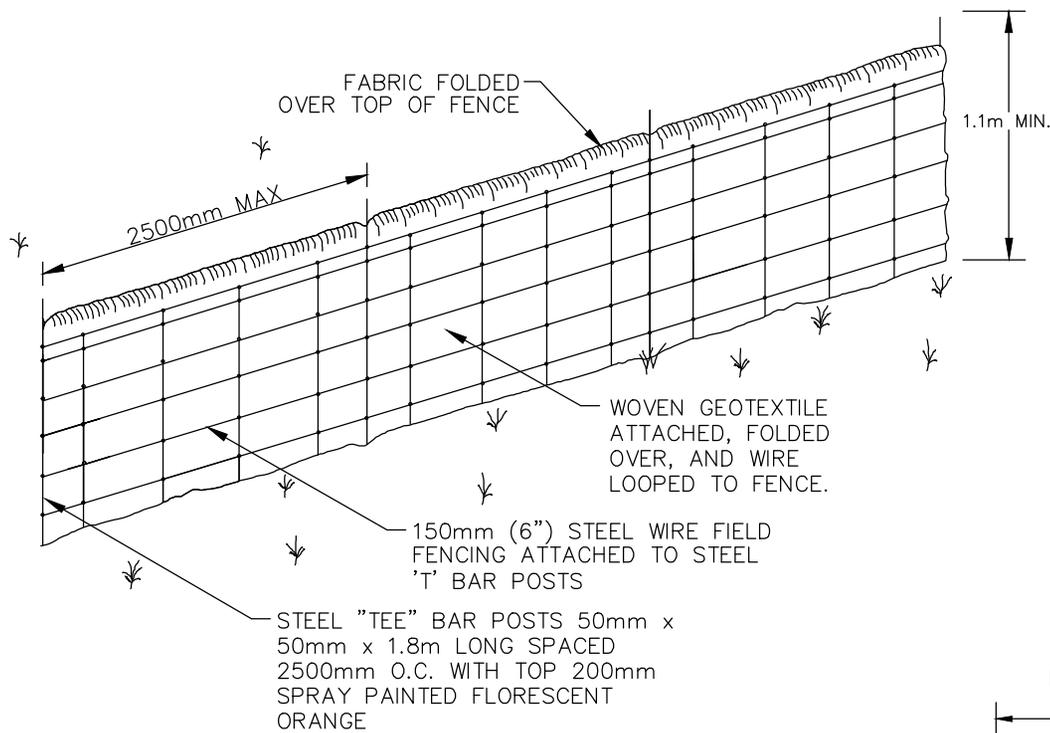
PLOT: 1=1

CHECKED: MJP

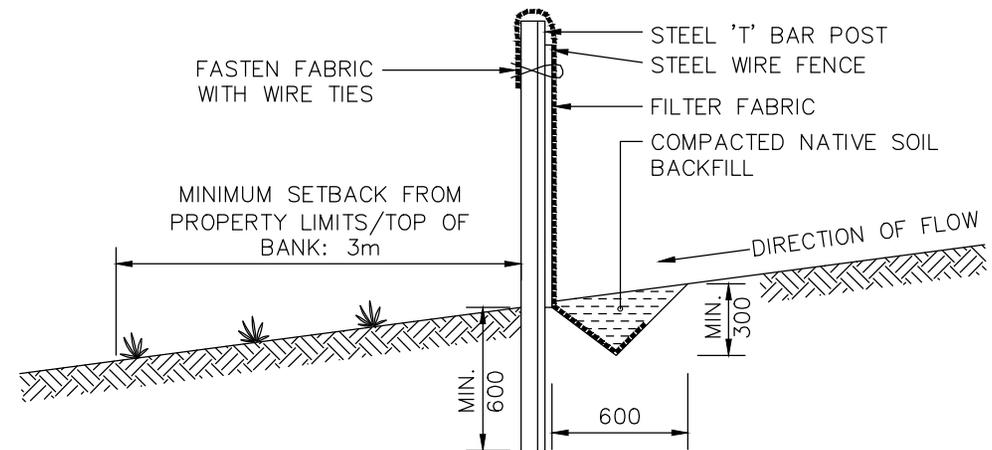
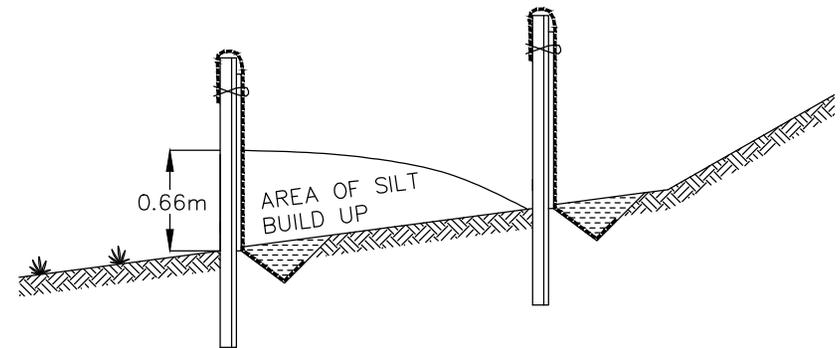
DATE: APRIL 2021



STD.DWG.No.15B



REPLACEMENT FENCE LOCATION



NOTES:

1. SILT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
2. SILT/SEDIMENT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD ON SLOPES THAT CONFORM TO MTO DRAINAGE MANUAL VOLUME 2 "CHART F4-3C TOPOGRAPHIC FACTOR LS BASED ON SLOPE LENGTH AND GRADIENT."
3. SILT/SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER MEDIA FABRIC TOED INTO THE SOIL A MIN. OF 300mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% INSITU SOIL STRENGTH.
4. STEEL 'T' BAR POSTS ARE TO BE SPACED MAX. 2500mm ON CENTER.
5. FROZEN GROUND CONDITIONS REQUIRE FILTER FABRIC TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
6. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
7. GEOTEXTILE FABRIC TO BE COMPRISED OF WOVEN OR NON-WOVEN U.V. STABILIZED MATERIAL. FABRIC TO BE FOLDED OVER TOP OF FENCE MIN. 300mm AND WIRE FASTENED.

TOWN OF WASAGA BEACH

TYPICAL DETAIL OF
SILT/SEDIMENT FENCE

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP

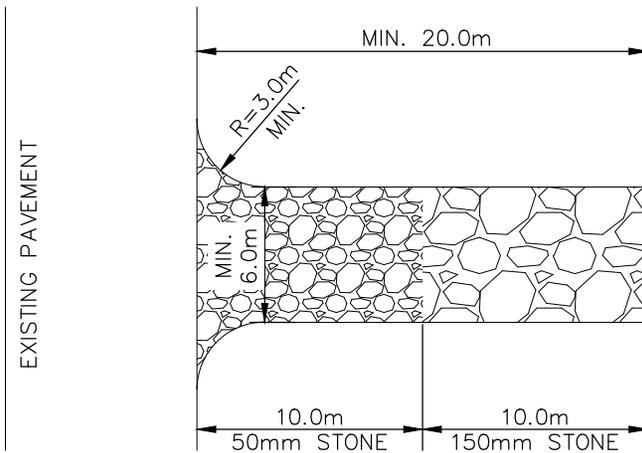
PLOT: 1=1

CHECKED: MJP

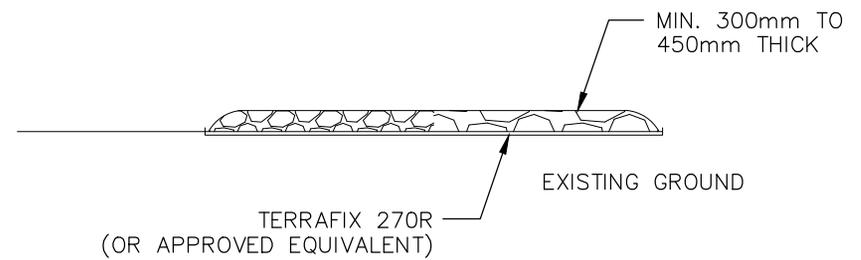
DATE: APRIL 2021



STD.DWG.No.16



PLAN

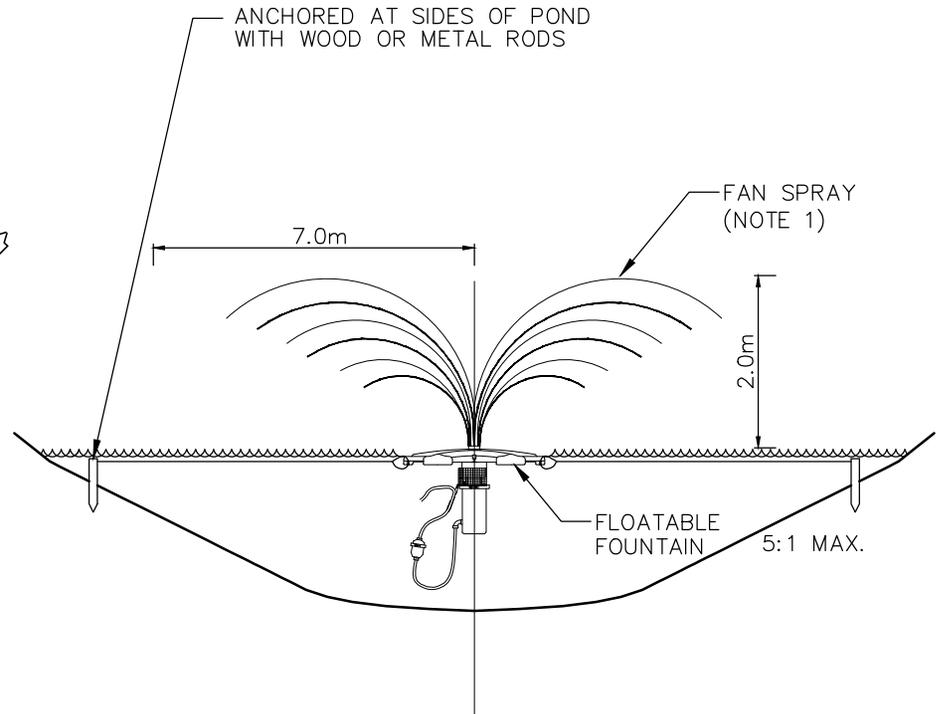
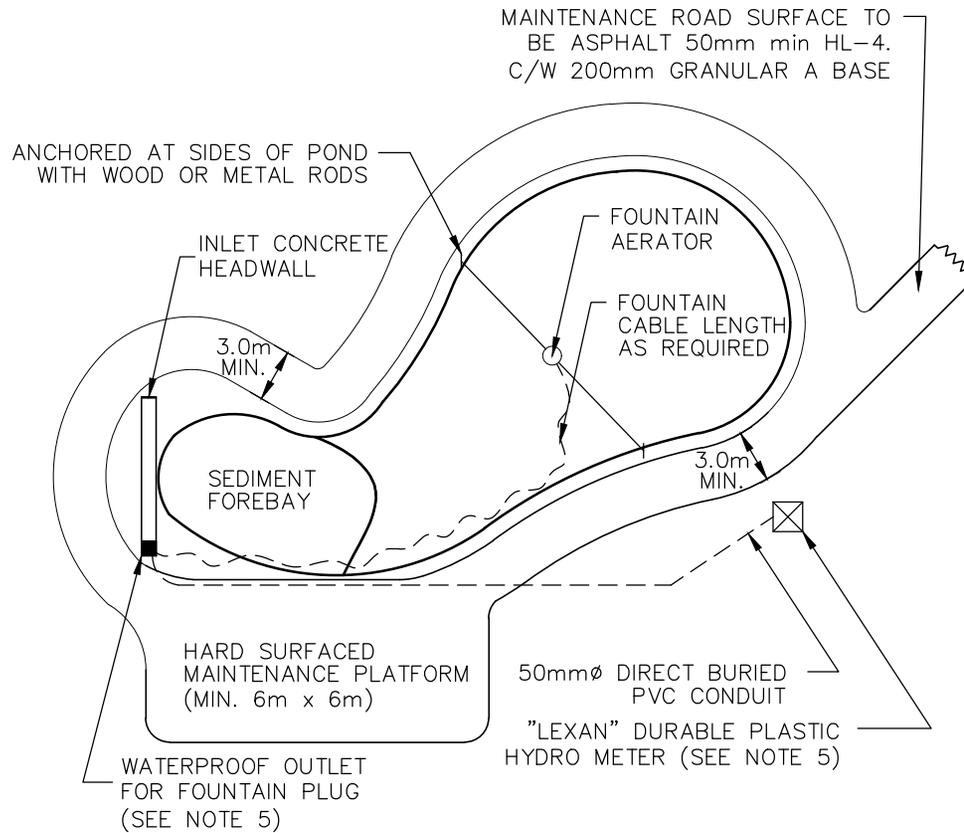


PROFILE

NOTES:

1. LENGTH AS REQUIRED BUT NOT LESS THAN 20m.
2. WIDTH OF 6m BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.
3. MINIMUM 300mm TO 450mm THICKNESS OF 50mm MINIMUM STONE SIZE EXTENDING FROM THE EDGE OF ROAD FOR 10m, THEN 150mm STONE FOR THE REMAINING 10m.
4. TERRAFIX 270R GEOTEXTILE (OR APPROVED EQUIVALENT) TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
5. ENTRANCES SHALL BE PROVIDED WITH A CULVERT IF REQUIRED FOR ROADSIDE SURFACE DRAINAGE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN THE ENTRANCE AND PROVIDE ADDITIONAL STONE TO THE SATISFACTION OF THE TOWN SUCH THAT SEDIMENT IS NOT TRACKED ONTO THE ADJACENT ROADWAY.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING ANY SEDIMENT THAT IS TRACKED ONTO MUNICIPAL RIGHTS-OF-WAY TO THE SATISFACTION OF THE TOWN.
8. INSPECTED DAILY AND REINSTATED ACCORDINGLY.

TOWN OF WASAGA BEACH		
STONE MUD MAT DETAIL		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.17
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. STORMWATER MANAGEMENT (SWM) POND FOUNTAIN AERATORS SHALL BE POWERHOUSE FOUNTAINS (DISTRIBUTOR: POND PERFECTIONS) MODEL F1000F – 1HP – SPRAY HEIGHT OF 6 FEET WITH A WIDTH SPRAY OF 21 FEET.
2. MINIMUM 1 FOUNTAIN PER SWM POND PENDING POND SIZE AND SHAPE.
3. FOUNTAINS ARE TO BE LOCATED IN PERMANENT POOL AREA WITH MIN. DEPTH OF 1.0m AND MAX. DEPTH OF 3.5m, AND IN ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS. FOUNTAINS ARE NOT TO BE LOCATED WITHIN THE SEDIMENT FOREBAY.
4. WATERPROOF JUNCTION BOX AND ELECTRICAL OUTLET TO BE SECURED TO SWM POND CONCRETE HEADWALL FOR THE FOUNTAIN PLUG.
5. "LEXAN" DURABLE PLASTIC HYDRO METER AND FOUNTAIN PANEL ON 3m x 150mm x 150mm WOODEN POST SET 1.2m INTO GROUND WITH CONCRETE FOOTING, POSITIONED ADJACENT THE MAINTENANCE ACCESS ROAD IN A LOCATION DEEMED ACCEPTABLE BY PUBLIC WORKS AND WASAGA DISTRIBUTION.
6. SEDIMENT FOREBAY BOTTOM TO BE 30MP α CONCRETE.

TOWN OF WASAGA BEACH

STORMWATER MANAGEMENT
POND FOUNTAIN AERATOR
DETAILS

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP

PLOT: 1=1

CHECKED: MJP

DATE: APRIL 2021



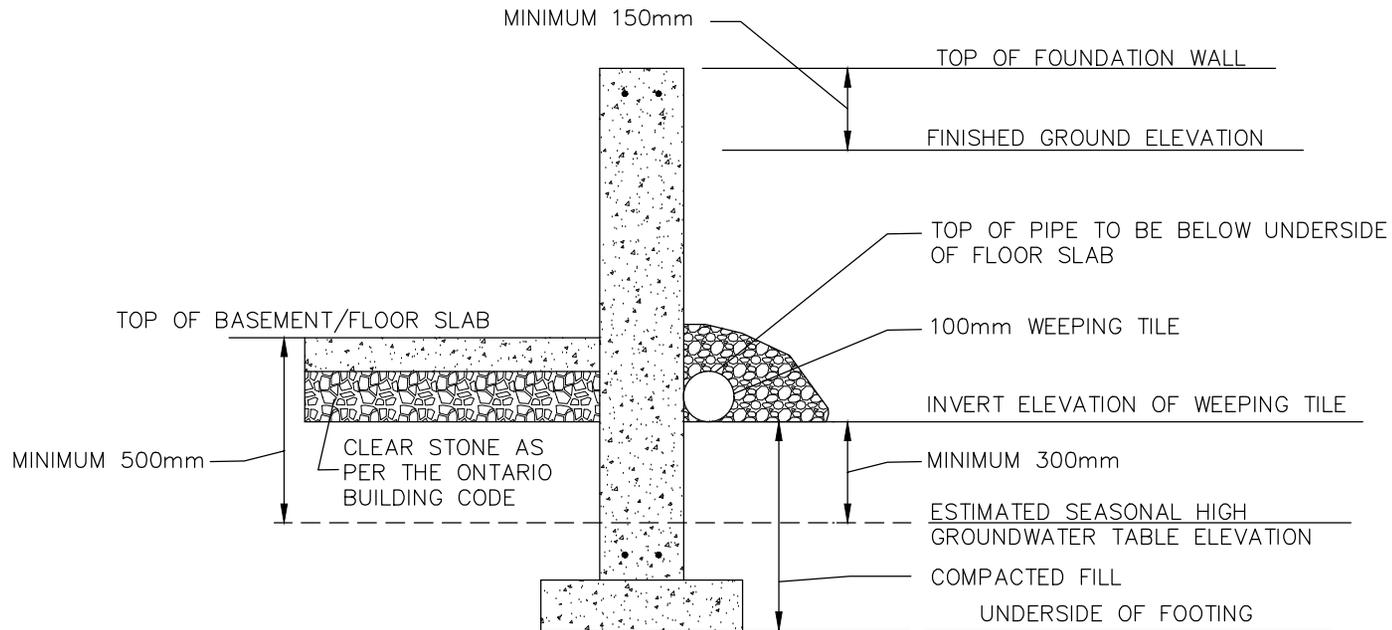
STD.DWG.No.18



NOTES:

1. SIGN(S) MUST BE PLACED AT ALL POND ENTRANCES & OTHER LOCATIONS TO BE DETERMINED BY THE TOWN.
2. SIGN(S) TO BE MANUFACTURED USING REFLECTIVE FINISH (ENGINEER GRADE), WITH TOP AND BOTTOM MOUNT HOLES.
3. SIGN(S) TO BE MOUNTED TO 3.8m A 100x100mm PRESSURE TREATED WOODEN POST EMBEDDED MIN. 1.0m INTO THE GROUND.

TOWN OF WASAGA BEACH		
STORMWATER MANAGEMENT POND WARNING SIGN		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.19
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. FOOTINGS WITHIN PROXIMITY TO THE GROUNDWATER TABLE SHALL BE UPSIZED ACCORDING TO THE ONTARIO BUILDING CODE AND/OR AS PER STRUCTURAL/GEOTECHNICAL ENGINEER DESIGN.
2. THE WEEPING TILE INVERT ELEVATION IS TO BE CONFIRMED IN WRITING BY THE BUILDER TO THE BUILDING INSPECTOR PRIOR TO BACKFILL INSPECTION.

TOWN OF WASAGA BEACH

FOOTINGS, WEEPING TILE AND
SEASONAL HIGH GROUNDWATER
TABLE DETAIL

DRAWN: MRT

SCALE: N.T.S.

DESIGN: PK

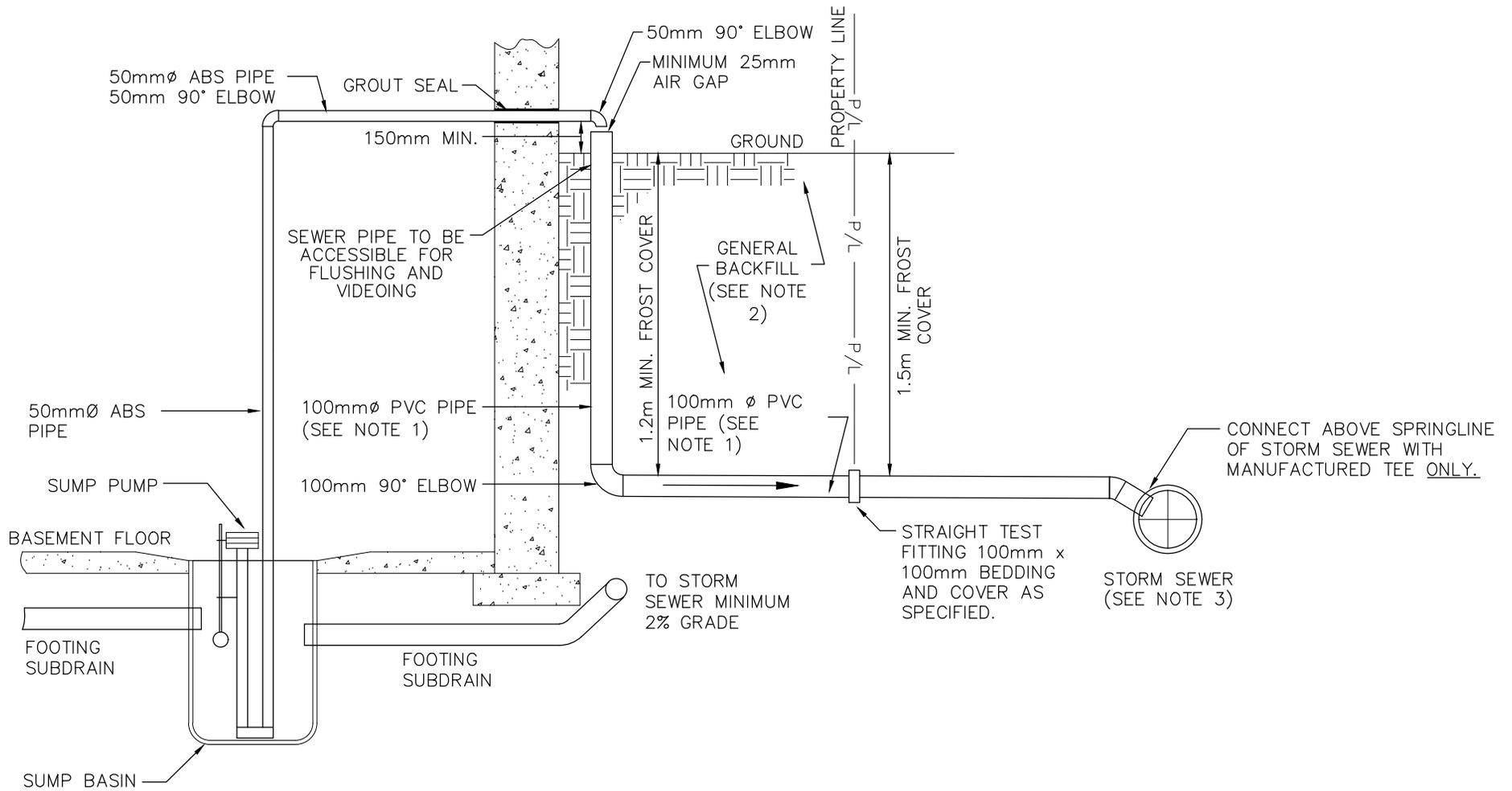
PLOT: 1=1

CHECKED: MJP

DATE: APRIL 2021



STD.DWG.No.20



NOTES:

1. REFER TO TOWN DESIGN STANDARDS FOR APPROVED MATERIALS.
2. GENERAL BACKFILL TO BE SELECT NATIVE BACKFILL MATERIAL.
3. STORM SEWER, CATCH BASIN OR OPEN DITCH AS APPLICABLE.
4. ALL FITTINGS ARE TO BE WATER TIGHT

TOWN OF WASAGA BEACH

SUMP PUMP DISCHARGE
DETAIL

DRAWN: MRT

SCALE: N.T.S.

DESIGN: MJP

PLOT: 1=1

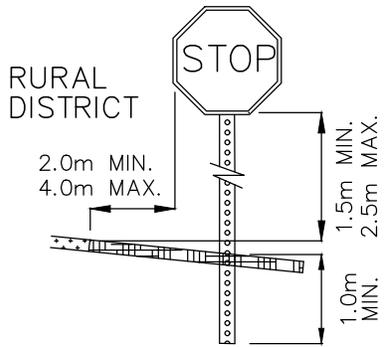
CHECKED: MJP

DATE: APRIL 2021

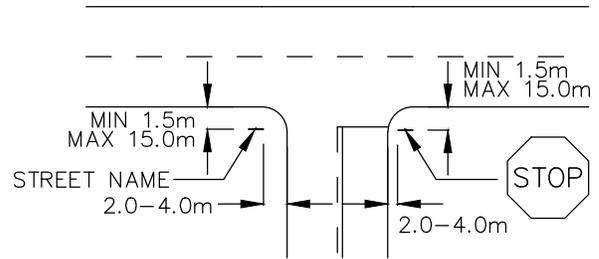


STD.DWG.No.21

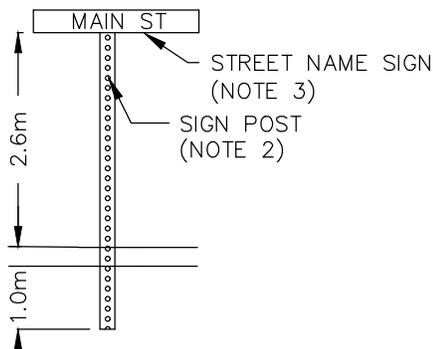
STOP SIGN



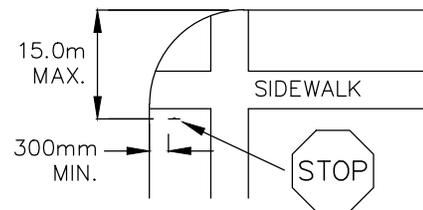
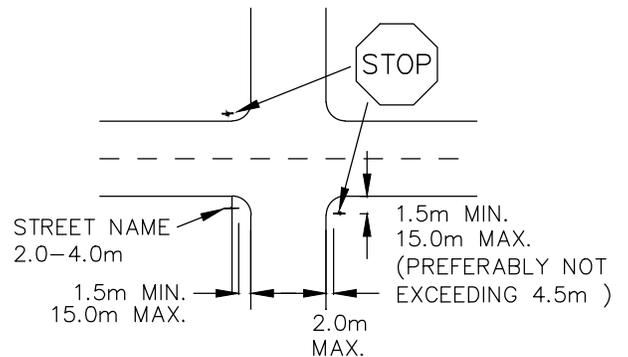
RURAL LAYOUT



STREET SIGN



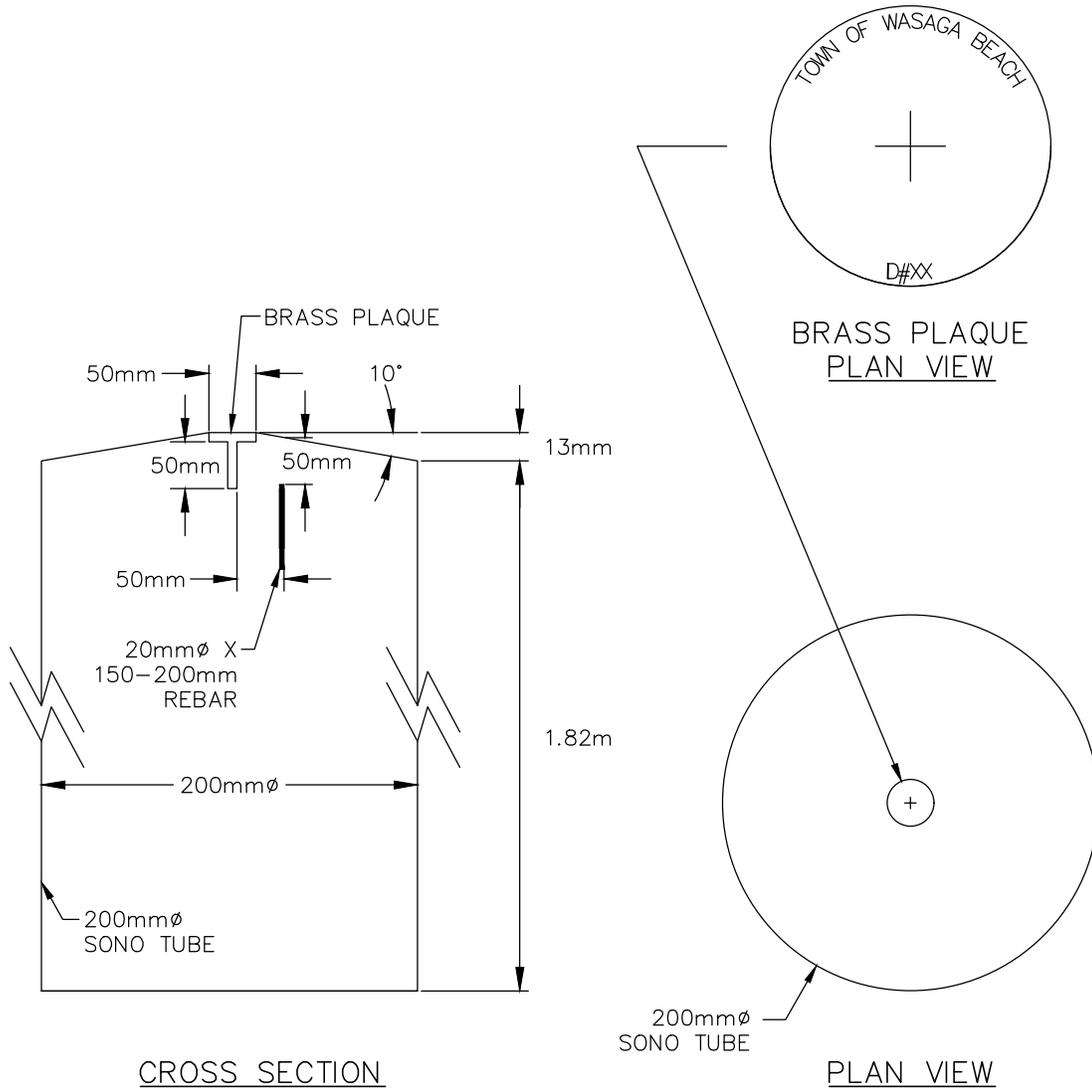
URBAN LAYOUT



NOTES:

1. ALL SIGN INSTALLATIONS ARE TO BE A MINIMUM 1.0m DIRECT EMBEDDED OR ON BREAKAWAY BASE, MOUNTED ON 14GA GALVANIZED STEEL SQUARE PUNCH OUT (45 X 45mm) OR UNIFLAGE POSTS, 3.6m LONG.
2. ALL REGULATORY SIGN MATERIAL SHALL BE ON ALUMINUM BLANKS WITH HI-INTENSITY BACKGROUND AND LEGEND MEETING ASTM SPEC. D4956-90 FOR TYPE III AND TYPE IV AND IN ACCORDANCE WITH CURRENT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND HIGHWAY TRAFFIC ACT MOUNTING.
3. ALL STREET NAME SIGN MATERIAL SHALL BE ON 160mm HIGH EXTRUDED ALUMINUM BLADES WITH A BULB "T" TOP AND BOTTOM. GREEN HI-INTENSITY SCOTCHLITE BACKGROUND WITH PRE-CUT 90mm WHITE HI-INTENSITY UPPER CASE BLOCK HIGHWAY LETTERING, ALL VACUUM APPLIED.
4. STREET NAME SIGNS ARE NOT TO BE MOUNTED ON SAME POST AS STOP SIGN. STREET NAME SIGN MUST BE MOUNTED ON THEIR OWN POST, IN A QUADRANT OTHER THAN A STOP SIGN.
5. THE SUFFIX OF EACH ROAD NAME "AVE., BLVD., RD., ST., ETC." IS TO BE ABBREVIATED.

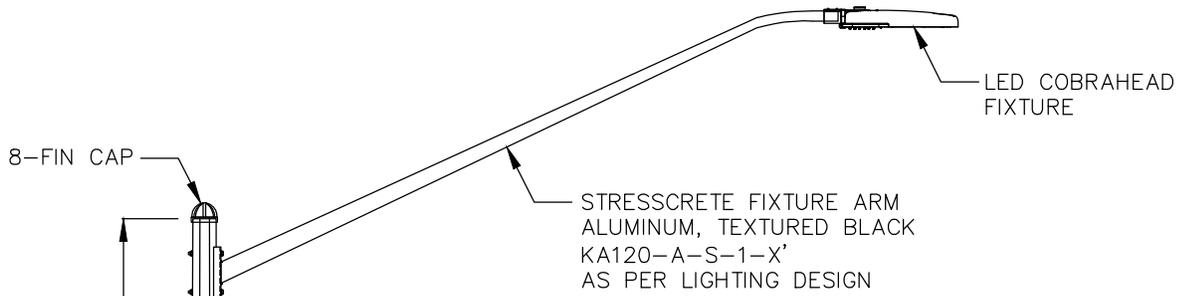
TOWN OF WASAGA BEACH		
STANDARD REGULATORY, WARNING AND STREET NAME SIGN LAYOUTS		
DRAWN: MRT	SCALE: N.T.S.	STD.DWG.No.22
DESIGN: MJP	PLOT: 1=1	
CHECKED: MJP	DATE: APRIL 2021	



NOTES:

1. BRASS PLAQUE TO BE SUPPLIED BY THE TOWN OF WASAGA BEACH PUBLIC WORKS.
2. REBAR TO BE EPOXY COATED.

TOWN OF WASAGA BEACH		
TYPICAL CONTROL MONUMENTATION LAYOUT		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MRT	PLOT: 1=1	STD.DWG.No.23
CHECKED: MJP	DATE: APRIL 2021	



POLE SPECIFICATIONS

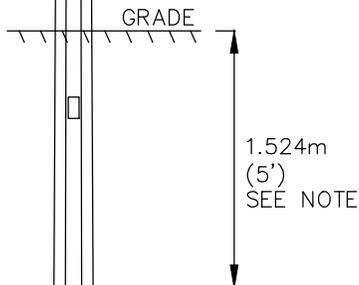
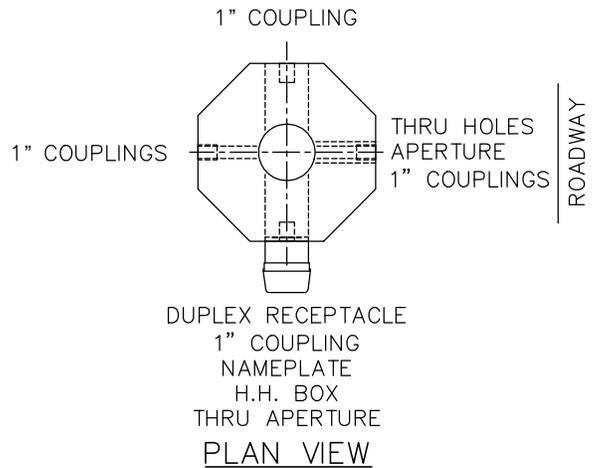
CATALOGUE NO.: E300--CPO--G--S11
 c/w 8-- FINCAP
 SECTION: OCTAGONAL
 COLOUR: ECLIPSE
 FINISH: POLISHED
 POLE TOP: 6" FL/FL
 POLE BUTT: 9 3/4" FL/FL
 POLE LENGTH: 9.144m (30')
 APPROX. WEIGHT: 1,500lbs.
 MIN. RACEWAY: 1-1/8"φ

POLE COATING REQUIRED:
 -2 COATS ACRYLIC, FULL LENGTH

NOTES:

IT IS RECOMMENDED THAT A COMPETENT PROFESSIONAL EVALUATE SOILS PRESENT ON SITE, CONFIRMING REQUIRED EMBEDMENT DEPTH, HOLE DIAMETER AND BACKFILL MATERIAL TO BE USED.

9.144m
(30')



TOWN OF WASAGA BEACH		
STREETLIGHT DETAIL		
DRAWN: MRT	SCALE: N.T.S.	
DESIGN: MRT	PLOT: 1=1	STD.DWG.No.24
CHECKED:MJP	DATE: APRIL 2021	

APPENDIX A

Example Lot Grading Checklist and Certificate

**TOWN OF WASAGA BEACH
LOT GRADING CERTIFICATION
CHECK LIST**

	YES	NO
1. Lot grading plan is attached.	<input type="checkbox"/>	<input type="checkbox"/>
2. Grading design amendments have received prior Municipal approval.	<input type="checkbox"/>	<input type="checkbox"/>
3. A pre-sod grade check was determined to be satisfactory	<input type="checkbox"/>	<input type="checkbox"/>
4. Sod or alternative ground cover has been placed and is sufficiently established.		
• Front yard and boulevard (Sod Only)	<input type="checkbox"/>	<input type="checkbox"/>
• Side Yards (Sod or approved alternative ground cover)	<input type="checkbox"/>	<input type="checkbox"/>
• Rear Yard (Sod or approved alternative ground cover)	<input type="checkbox"/>	<input type="checkbox"/>
5. Final grades have been checked and are in general compliance with lot grading plan.		
- Apron/Garage Floor	<input type="checkbox"/>	<input type="checkbox"/>
- Lot Corners	<input type="checkbox"/>	<input type="checkbox"/>
- Side yards	<input type="checkbox"/>	<input type="checkbox"/>
- Top of Foundation Wall	<input type="checkbox"/>	<input type="checkbox"/>
- Underside of Footing	<input type="checkbox"/>	<input type="checkbox"/>
6. Side yard Swales are well defined.	<input type="checkbox"/>	<input type="checkbox"/>
7. Rear yard Swale is well defined.	<input type="checkbox"/>	<input type="checkbox"/>
8. Splash pads have been placed at all downspouts.	<input type="checkbox"/>	<input type="checkbox"/>
9. Finish grades are a min 150 mm below brick/siding.	<input type="checkbox"/>	<input type="checkbox"/>
10. There are no areas of settlement at or adjacent to foundation walls.	<input type="checkbox"/>	<input type="checkbox"/>
11. Grading encroachment on adjacent lots has been reinstated to the satisfaction of the adjacent lot Owner(s).	<input type="checkbox"/>	<input type="checkbox"/>
12. Water service curb stop flush with final grade and accessible.	<input type="checkbox"/>	<input type="checkbox"/>
13. Sanitary service cleanout flush with final grade, or max. 150mm below final grade and accessible.	<input type="checkbox"/>	<input type="checkbox"/>
14. Weeping tile sleeve elevation confirmed (where applicable).	<input type="checkbox"/>	<input type="checkbox"/>
15. Soakaway pits installed per the accepted grading plan.	<input type="checkbox"/>	<input type="checkbox"/>
16. As-Constructed driveway culvert inverts (where applicable).	_____	_____
To be tested by Town of Wasaga Beach Public Works Department:		
17. Water service curb stop operational.	<input type="checkbox"/>	<input type="checkbox"/>

If **NO** to any item explain and describe graphically on the attached lot grading plan.

TOWN OF WASAGA BEACH
CERTIFICATE OF LOT GRADING

SUBDIVISION NAME: _____

REGISTERED PLAN NO.: _____

LOT NO.: _____ HOUSE NO/STREET _____

This is to confirm that I/we have inspected the above noted lot (s) and certify that lot grading and associated grading requirements are in general compliance with the overall grading design, which was "Accepted for Construction" for this lot together with the grading check list, copies of which are attached.

CERTIFIER: _____ DATE: _____

COMPANY: _____

_____ STAMP: _____

NOTES:

APPENDIX B

Municipal Servicing Testing Requirements

MUNICIPAL SERVICING TESTING REQUIREMENTS

WATERMAIN

Swabbing (1*)

Hydrostatic Pressure Test (1*)

Chlorination / Chlorine Residual (1*)

Flushing to municipal levels (Cl range to be verified with WBPW) (1*)

Bacteriological Sampling (after 16 hr per AWWA C651 Standard) (1*)

Curb Stop Operation – by Public Works (1 & 3)

Valve Operation – by Public Works (1 & 3)

Hydrant Operation – by Public Works (1 & 3)

Continuity (Tracer Wire) Test – by Public Works (1)

Fire hydrant visual inspection – by Town Engineer (1* & 3*):

- Height and angle
- Paint is acceptable
- Flange mounted hydrant marker installed
- "Pump after each Use" sticker applied (provided by Town)
- Anti-tampering devices (installed after all testing for 1*, removed for 3*)

All connections to the live municipal system to be witnessed by Public Works Staff

SANITARY SEWER

Deflection (Mandrel) Test (1*)

Leakage (Infiltration/Exfiltration) Test (1*)

Visual MH inspection (1*, 2* & 3*)

Flushing (1* & 3*)

CCTV Inspection (1* & 3*)

All connections to the live municipal system to be witnessed by Town Engineering Staff/representative (and Public Works Staff if deemed appropriate)

All connections to the existing system are to remain plugged until after issuance of the Certificate of Substantial Completion (Basic Services)

STORM SEWER

Visual – CB, RLCB, CBMH and MH inspection (1*, 2* & 3*)

SWM Facility Inspection (1* & 3*)

Flushing (1* & 3*)

CCTV Inspection (1* & 3*)

SWM Pond warning signage (2*)

SWM pond cleanout and certification (3*)

ROADWORKS

Sub-grade Proof roll (1*)

Granulars Sieve Analysis & Compaction (1*)

Curb & Gutter (Concrete Strength – 1*; Visual – 2* & prior to placement of surface course asphalt)

Base Course Asphalt (Compaction and Visual – 1*; another visual prior to placement of surface course asphalt)

Surface Course Asphalt (Compaction and Visual – 3*)

Sidewalk (Visual) (3*)

Street signs (Visual) (1*, 2* & 3*)

Streetlight (Visual) (1* & 3*)

Assumption/Final inspections (3*)

1 - To be completed prior to issuance of the Certificate of Substantial Completion (Basic Services)

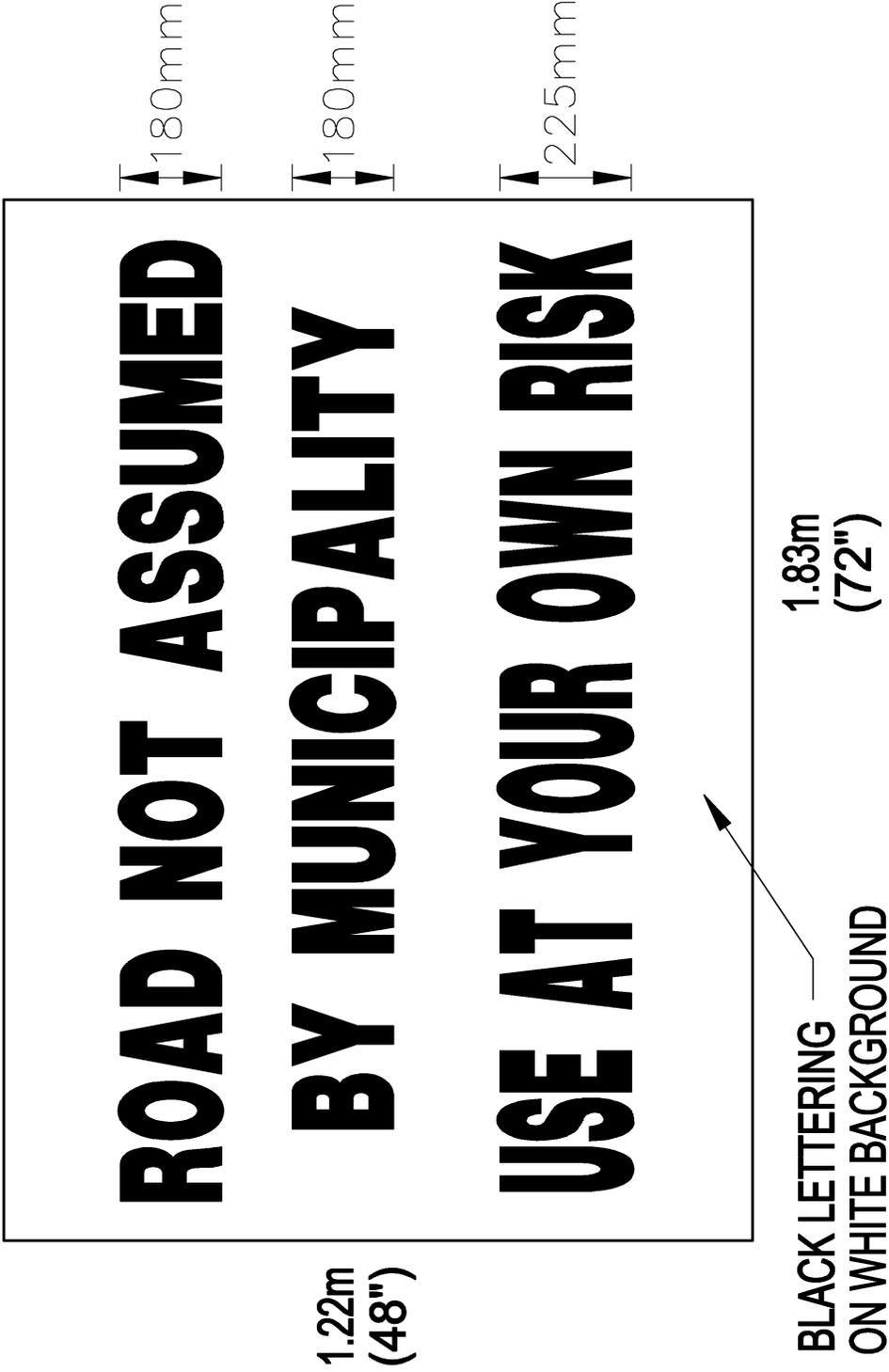
2 - To be completed prior to issuance of the Certificate of Substantial Completion (Full Services)

3 - To be completed prior to issuance of Certificate of Acceptance (Full Services).

Town Engineering staff to attend all of the above noted inspections marked with an asterisk.

APPENDIX C

Road Not Assumed Sign Detail



APPENDIX D

**Stormwater Management
Facility Specification Summary**

Town of Wasaga Beach
Stormwater Management Facility Specification Summary

The Town maintains a digital database for stormwater management facilities.

This database is used to assist in maintenance and operation of these facilities.

The developer's engineer/consultant shall provide the following summary list of information in order for the Town to update their inventory of facilities.

This list shall be provided in the final design report and in the Operations and Maintenance Manual and shall be updated by the consultant at the time of assumption.

- Facility Type: (wetland, wet pond or hybrid)
- Quality Control Level: (e.g.. Level 1 - 80% TSS removal)
- Erosion Control Level: (e.g.. 25 mm event - 48 hr. detention)
- Quantity Control Level: (e.g.. 2 to 100 year post to pre)
- Pre Treatment: (e.g.. oil/grit separator)
 - Pre-treatment structure type and model
 - Pre-treatment structure size
 - Structure maintenance schedule included in Operations and Maintenance Manual
- Flow Splitter: (yes or no)
- Online: (yes or no)
- Off-line: (yes or no)
- Sediment Forebay: (yes or no)
- Forebay Lining Type: (e.g.. Concrete)
- Forebay Ramp: (e.g.. Turfstone and Width)
- Forebay Pool Volume: (m3)
- Water Table Elevation: (distance above or below permanent pool)
- Facility Liner: (e.g. native or clay liner)
- Minor System Drainage Area: (ha)
- Major System Drainage Area: (ha)
- Permanent Pool Volume: (m3)
- Permanent Pool Elevation: (geodetic)
- Permanent Pool Required: (m3)
- Max. Permanent Pool Depth: (m)
- Permanent Pool Surface Area: (m2)
- Erosion Control Volume: (m3)
- Erosion Control Elevation: (geodetic)
- Max. Erosion Control Depth (m)
- 5 year Ponding Depth (m)
- 100 year or Max. Ponding Depth (m)

- Outlet Description: (detailed description of control structure including size and elevations of orifices, weirs and ditch inlets)
- SWM Block Area: (ha)
- Access Type and Width: (e.g. 3.0m pavement)
- Landscaped
- Aquatic Plantings (yes or no)
- Warning Signage locations
- Fountain/aeration equipment (specifications)

APPENDIX E

**Operations & Maintenance Manual Requirements
For Private Development**

OPERATIONS & MAINTENANCE MANUAL

1.0 Introduction

2.0 Site Location

3.0 Watermain Distribution System

- Domestic Supply
 - Size, material type
 - Water meter location and details
 - Backflow preventer or check valve details and associated maintenance/inspection requirements
 - All valves exercised twice annually to ensure they are accessible and remain operational
- Fire Supply
 - Fire Hydrant
 - Details (type, location, etc...)
 - Hydrant to be inspected annually and after each use
 - Hydrant & Valve inspection and maintenance in accordance with Subsection 6.6.5 of the Fire Code
 - Associated snow removal requirements
 - Anti-freeze process prior to winter
 - Sprinkler System
 - Siamese Connection Location / Details
- Watermain Testing Requirements
 - Shall conform to AWWA and OPSS
 - WBPW require 48 hours notice prior to operation of valves
 - Watermains are to be disinfected in accordance with AWWA C651 (latest revision), Standard for Disinfecting Watermains.
 - Swab, hydrostatic pressure test OPSS 441, Chlorination, Chlorine Residual, Bacteriological Sampling – 2 sets (after 16 hr per AWWA C651 Standard), Continuity test of the tracer wire
- Operation and Maintenance by Qualified Operator
 - Inspection and operation of valves, etc. shall be undertaken by a qualified operator certified by the Ministry of the Environment (MOE) and a copy of the inspection / maintenance report is to be provided to the Public Work Department
 - Alternatively, arrangements can be made with the Town to have the certified operators of the Public Works Department undertake the inspection and maintenance of hydrants and valves, at the Owner's expense.
- The owner is responsible for their service and associated maintenance from their site to the trunk watermain situated within the municipal right-of-way.
- Backflow Prevention
 - An annual report prepared by a certified inspector must be submit to the Wasaga Beach Public Works department confirming that all backflow

prevention devices have be inspected, tested and certified in accordance with MOE and Building Code requirements.

4.0 Sanitary Collection System

- Maintenance hole or cleanout at property line for access for inspection and cleanout
- SAN MH inspection twice annually
- In the event of blockage, a CCTV inspection may be undertaken by a plumber/mechanical contractor to determine the cause and subsequent cleaning or flushing requirements
- The owner is responsible for their service and associated maintenance from their site to the trunk sanitary sewer situated within the municipal right-of-way.

5.0 Storm Sewer System

- Catchbasins, catchbasin Maintenance holes and storm Maintenance holes must be inspected regularly to ensure that the grates are not clogged with debris.
- CB sumps must be inspected every Spring and Fall and cleaned once annually to remove debris accumulated over the year including sand from winter snow clearing operations.

6.0 Stormwater Management Facility

- Stormwater Quantity Control
 - Detention/Retention Facility
 - Rooftop Storage Details
 - Max. 150mm depth
 - Overflow weir details, location, etc.
 - Roof drain location, type, etc.
 - Controlled flow roof drains c/w anti-tampering screens
 - Storm service connection details
 - Parking Lot Storage Details
 - Max. 200mm depth
 - No ponding up to and including the 1:5yr event
 - Overland Flow Route
 - Reduced pipe/orifice plate details, location, etc.
 - Lot level control / Low Impact Development (LID) Details
 - Type, location and sizes of facilities
- Stormwater Quality Control
 - Oil/Grit Separator
 - Details
 - Manufacturers recommended maintenance requirements
 - Removal of sediment and petroleum deposits, together with approved disposal location.
 - Local maintenance contractors
 - SWM Pond
 - Sediment forebay cleanout frequency, measures and estimated cost

- General maintenance requirements, etc.
- Soakaway Pit
 - Details, location, etc.
 - Eaves trough and screens to be inspected min. twice annually – spring and fall
 - Access port cap – flushing
- Lot level control / Low Impact Development (LID) Details
 - Frequency of maintenance / cleanout
 - Details for cleanout measures including depth of removals and disposal of materials
 - Type and quantity of material required to replace filtration materials

7.0 Snow Storage/ Removal

- The owner is responsible to provide snow clearing operations for the parking facilities and all accesses
- Snow storage locations must not encroach municipal right-of-way or adjacent properties and must not conflict with drainage systems
- In the event that the site does not have sufficient area for snow storage in accordance with the accepted Site Plan, snow accumulation is to be removed off-site at the owner's expense

8.0 Pavement Markings

- Site pavement markings including directional guidelines, parking stalls, and symbols are to be re-painted at minimum once a year and/or as required to maintain adequate information for motorists and pedestrians
- Estimated costs for maintenance

9.0 Summary and Conclusions

APPENDIX F

**Site Plan Requirements
for Private Development**

Site Plan Requirements

The following items are standard planning and engineering requirements applied to the development or redevelopment of a site. These requirements are to be read in conjunction with the Town of Wasaga Beach Engineering Standards and the Site Plan application requirements as available at the Town Planning Office.

1. General

- All plans must be prepared by a qualified professional (planner, engineer, architect, landscape architect).
- All plans shall be drawn to scale (a metric scale of 1:200 or 1:250 is recommended) and shall include a key plan showing the property location (1:10,000).
- All plans shall be based on a plan of survey prepared by an Ontario Land Surveyor and should include a complete legal description, all property bearings and dimensions, geodetic data, location of bench marks, north arrow and a detailed title block showing the owner's name, the person/firm that prepared the plan and the date (including a revision box.)
- All Site Plan and building design must include accessibility requirements in conformance with the Ontario Building Code Section 3.8 and the Accessibility Ontario Disabilities Act.)

2. Reports

- All Reports are to be prepared by a qualified professional (Planner, Engineer, Architect, landscape Architect, etc.)
- The relevant studies that are applicable to each application shall be confirmed through the Pre-consultation process, which is managed through the Town Planning Department. Such documentation is to include (as applicable), but shall not be limited to, copies of the following reports unless waived by the Town Engineer:
 - Functional Servicing Report
 - Geotechnical/Soil Stability Report
 - Hydrogeological Study / Hydrology Study or Water Budget
 - Planning Needs/Justification Report
 - Stormwater Management Report
 - Natural Hazards Study and/or Coastal Engineering Study
 - Noise Impact Analysis
 - Source Water Protection Land Use Questionnaire
 - Traffic Impact Study
 - Tree Preservation/Inventory/Arborist Report
 - Operations & Maintenance Manual

3. Site Plan

All existing site conditions must be shown on the Site Plan, including:

- All site plans must demonstrate the designs are in conformance with the requirements of Zoning By-law 2003-60 as amended.
- Boundary dimensions, property lines and area of the site.
- Location of all buildings and structures indicating all building dimensions, setbacks, separations, projections, canopies, ground signs, retaining walls etc.
- Location and width of existing walkways, driveways, parking and loading areas, width of all streets abutting the site, street widenings, curbs, sidewalks.
- 0.3 m reserves, rights-of-way, easements.
- Existing natural features – vegetation, watercourses, wetlands, steep slopes etc.
- Abutting land uses, structures and features.

All proposed features must be shown on the Site Plan, including:

- Location and dimensions of all proposed buildings and structures (Note: please refer to the Town's By-law for specific zoning provisions).
- Location and dimensions of all proposed driveways/access points.
- Location, dimension and type of all parking and loading areas (i.e. surface, garage, deck, underground). Indicating any areas to be assigned to visitors, tenants, employees, and handicapped parking (Note: please refer to the Ontario Building Code and Town's Zoning By-law for specific accessibility and parking/loading provisions).
- Location and nature of all landscape areas including walkways, sidewalks, courts, walls, fences, entrance features, etc.
- Location and size of any signs and lighting thereof (Note: all signs should be designed/installed in accordance with the Town's By-law No. 96-10).
- Location and direction of exterior lighting.
- Location and type of garbage enclosure.

The following development statistics in chart form must be shown on the Site Plan:

- Zoning of the site – the standards required by the zone and those provided (i.e. site area, density, frontage, setbacks, parking/loading etc.)
- Building type, number of floors, total number of units and height.
- Total gross floor area of both the existing and the proposed buildings.
- Area and percentage of the site (i) covered by buildings (lot coverage) (ii) paved and (iii) landscaped.

The following landscape information must be shown on the Site Plan, or contained in a separate landscape plan:

- Existing trees/shrubs by type and size – identify which vegetation is to be preserved (vegetation to be removed should be indicated by a hatched line).
- Location, type, size, spacing and number of new plantings where substantial landscaping is proposed, include a plant materials list showing the name, size and quantity of all new plantings.
- Location, type and size of all planters.
- Location, dimensions and construction materials for all sidewalks, walkways, fences, acoustic fences, walls, ramps, stairs, patios, decks, and similar features.

- Location and dimensions of all recreational facilities and amenity areas.
- When planning the landscape features, the following considerations should be incorporated into the layout:
 - Appropriate plant species for Zone 5a hardiness and for areas prone to salting and snow loading, sunny or shade areas, wet or dry soils, and acid or alkaline soils.
 - Landscape buffer strips, being a row of trees or a continuous hedgerow of evergreens or shrubs approximately 1.5 m high, along the lot lines adjacent to existing residential uses and a minimum 1.8 m high solid board fence.
 - Decorative planting schemes along the street frontages.
 - Shade trees planting adjacent to parking areas and within parking islands.
 - Shrub massing to soften fence lines and to add relief to asphalt surfacing.
 - Sufficient area for snow storage.
 - Planting schemes should emphasize the use of native species.

4. Site Servicing Plan:

The following information must be shown on the site-servicing plan:

- Existing and proposed contours and/or spot elevations, benchmarks and elevations on site (at all grade changes and intervals no greater than 10.0 metres over the entire site) and on abutting roads and properties.
- Existing and proposed grades and ground floor elevations, including:
 - The first floor building elevations, together with underside of footings, basement floors and top of foundation wall.
 - The proposed finished ground grades (use spot elevations) sufficient to show all surface drainage, including elevations, gradients and cross sections of ditches and swales.
- Existing and proposed utilities and services on and adjacent to the site, including:
 - Sanitary sewers, storm sewers, catch basins, waterlines, ditches and swales, electrical system, driveway, culverts, etc.
 - Type, size, grades, class and CSA standards for all pipes.
 - Locations and size of any septic systems, tile beds, soakaways, holding tanks, wells.
 - Location and size of meter rooms, transformers, vault valves, Siamese connections, etc.
 - Top of grate and invert elevations of all Maintenance holes and catchbasins.
- Show existing and proposed roads, driveways and curbs including:
 - Type of and thickness of the surfacing material.
 - Traffic circulation, traffic signs, curbs and line painting.
 - Proposed road widenings, daylight triangles, or any other related dedications or easements.
- Proposed stormwater management quantity and quality control structures, together with construction and permanent erosion and siltation control structures.

5. Building Elevations:

The building plans must show the exterior walls of the proposed buildings in sufficient detail to indicate the following:

- Design concept of the building and exterior building materials.
- Entrances, doors, arcades, any recesses, projections or special features
- Finished grade, floor and roof elevations
- Proposed facia, signs, lights, equipment and equipment housings

APPENDIX G

Town of Wasaga Beach Approved Materials List



APPROVED MATERIALS LIST

REVISED: APRIL 2021

TOWN OF WASAGA BEACH

LINEAR WASTEWATER

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Main Line Non-Pressure Pipe	Polyvinyl Chloride (PVC) Solid Wall 200mm ø to 400mm ø inclusive	CSA B182.2 ASTM D 3034 SDR 35 minimum Minimum pipe stiffness - 320 kPa	Ipex Inc	Ring Tite	·Rubber gasket bell and spigot joints
			Royal Pipe Systems	Royal Seal	
			Diamond Plastic Corp.	SANI-21	
	Polyvinyl Chloride (PVC) Solid Wall 450mm ø and larger	CSA B182.2 ASTM F 679 (T-1) SDR 35 minimum Minimum pipe stiffness - 320 kPa	Ipex Inc	Ring Tite	·Green in Colour
			National Pipe & Plastic Systems	Ever-Green	·Rubber gasket bell and spigot joints
			Royal Pipe Systems	Royal Seal	
	Polyvinyl Chloride (PVC) Profile (Ribbed) Wall 250mm ø to 450mm ø inclusive	CSA B182.4 ASTM F-794 Minimum pipe stiffness - 320 kPa	Ipex Inc	Ultra-Rib	·Rubber gasket bell and spigot joints
			Royal Pipe Systems	Korflo	·Green in Colour
	Concrete up to and including 900mm ø	CSA A257.1, A257.2 and A257.3 (whichever applies per design) OPSS 1820			·Manufactured at a prequalified plant and marked with a "Prequalification Stamp" (triangular symbol)
Concrete larger than 900mm ø	CSA A257.2 Joints - CSA A257.3 OPSS 1820			·Manufactured at a prequalified plant and marked with a "Prequalification Stamp" (triangular symbol)	
High Density Polyethylene (HDPE)	CSA B182.6 Minimum pipe stiffness - 320 kPa	KWH Pipe Canada Ltd.	Weholite	·Corrugated outer & smooth interior walls ·All pipe to have a light coloured interior to facilitate CCTV Inspections	
		Armtec	BOSS Poly-Tite		
Service Connections	Polyvinyl Chloride (PVC) Solid Wall	CSA B182.1 ASTM D 3034 Fittings - ASTM D 3034 Minimum pipe stiffness - 630 kPa (SDR 28)	Ipex Royal Pipe Diamond National		·Rubber gasket ball and spigot joints ·White only for storm water connections



APPROVED MATERIALS LIST

REVISED: APRIL 2021

TOWN OF WASAGA BEACH

LINEAR WASTEWATER

Product	Type	Specifications	Manufacturer	Description /Model	Comments	
Saddles	Concrete and Vitrified Clay Pipe	Factory made Tees are to be used for any new construction	NPC Inc.	Kor-N-Tee	·Concrete pipe only ·300mm ø and larger	
			Romac Industries	CB - Sewer Saddle		
			Galaxy Plastics	Core-Bell Adapter	·Concrete pipe only	
			Crowle	Cast Iron Saddles		
	PVC Pipe	Factory made Tees are to be used for any new construction	Crowle	Cast Iron Saddles	·CSA B182.2 (ASTM D3034) Pipe only	
			Romac Industries	CB - Sewer Saddle		
			NPC Inc.	Kor-N-Tee		
			Ipex			
	Various			Le-Ron Plastics	"Epoxy On" Saddle	CSA B182.4 (ASTM D3034) pipe only
				Clow	d50	
Couplings			Rollee	Kwik Coupling		
			Mission Rubber Co.	Adjustable Repair Couplings (ARC)		
			Fernco Couplings	RC Series		
			Fernco Couplings	5000 Series		
			Straub Tadco Manufacturing	Straub Flex/open Straub Grip		
			Preper-PLS	Preper		
			Joint Restraints	PVC Pipe		
UniFlange Series 1350C	·For PVC pipe bell joints (360° contact)					
UniFlange Series 1500C	·MJ retainer gland joint restraint (360° contact)					
Sanitary Service Cleanout / Inseption Chamber	Cast Iron lid	125 x 125 x 200 wye	Royal Pipe Systems	71A08DRVVOXG	·PVC lids incude metal detectable cap ·all per Town Std. Dwg. No. 12	
	PVC tee		Royal Pipe Systems	70A5R4W/OPAL		



APPROVED MATERIALS LIST

REVISED: APRIL 2021

TOWN OF WASAGA BEACH

LINEAR WASTEWATER

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Repair Clamps		CSA B602	Rollee	Kwik Coupling	
			Mission Rubber Co.	Flex-Seal- ARC	
			Cambridge Brass	Series 425	
			Romac Industries	SS Repair calmp	
Service plugs	Plastic				
	Zinc Plated				
	Epoxy Coated		Crowle		
Pressure Pipe (Forcemains)	Polyvinyl Chloride (PVC)	CSA B 137.3 Joints - ASTM D3139 DR18	Ipex		·Bell and spigot joints
			National		
			Diamon		
			Royal Pipe	IPS Series, 40 to 300 mm	·Green in colour
			Next Polymers		·Installed with 12 Gauge stranded tracer wire
	Polyethylene (HDPE)	CSA B137.0, B137.1 ASTM D3035, D3350 or CG 5 Spec. 41-GP-25M DR11 (size and class as per design)	KWH Pipe Canada Ltd	Sclairpipe	·Jointed by thermal butt fusion or flanges
			Oxford plastics	PE3408/3608	·Installed with 12 Gauge stranded tracer wire, 4x12 Gauge stranded tracer wire for HDD installations
	Concrete Pressure Pipe	AWWA C301, C304 or C303	Forterra DECAST		·Bell and spigot joints ·Installed with tracer wire
Check Valves	EVR Duckbill Check Valve	CSA Z299.3-85	Devine & Associates	CPO, CPI CPJ, CPF	·Approved for use in Wastewater Applications only
	Rubber Flapper Check Valves		Apco	Series 100	



APPROVED MATERIALS LIST

REVISED: APRIL 2021

TOWN OF WASAGA BEACH

LINEAR WASTEWATER

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Fittings	Cast Iron and Ductile Iron	ANSI A21.10 AWWA C111 Furnished with mechanical or push-on Tyton joints - ANSI A21.11, AWWA C11 Flanged End rated at 125 psi for PE pipe installations	Sigma Star Bibby		Stainless steel nuts and bolts
	Polyvinyl Chloride (PVC)	Used with PVC pipe only CSA B182.4, ASTN F.794 - Ribbed CSA B182.1, B182.2, ASTM D3034 - Corragated ASTM D3034 - Solid Wall		Ipex Royal Galaxy GPK	Stainless steel nuts and bolts
Air Release Valves	Combination Air Release/Vacuum Breaker		Crispen Valve	S/LS Series	Shall be tall bodied valves complete with flushing port and flood safe
			Vent-O-Mat	Sewer RGX Series	
			Val-Matic		
			A.R.I.	D020 D025P D025SS	
			Devine & Associates		
Casing Spacers		T-304 Stainless Steel	Cascade	CCS -1320-8	<ul style="list-style-type: none"> Ultra high molecular weight polymer runners (or equivalent) Position of pipe within liner to be centered and restrained, sufficient to provide no less than 19mm clearance between casing and bell of pipe Pipe restrained laterally for the entire length of the liner Sealed using wrap around rubber ends complete with stainless steel (T-304) banding
			CCI Pipeline Systems	CSS8 and CSS12	



APPROVED MATERIALS LIST

REVISED: APRIL 2021

TOWN OF WASAGA BEACH

LINEAR WASTEWATER

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Precast Maintenance Hole and Components	Concrete	CSA A 257.4 ASTM C-478 OPSS 1351	Con Cast Pipe M Con Pipe & Product Forterra Pipe DECAST Concrete Devine & Associates		Includes precast drop structure
	Pre-Benched	same as concrete			
Maintenance Hole Frame and Cover	Standard	OPSD 401.01 - Type A, no lugs	Bibby Ste. Croix		Cast iron, square frame with circular closed cover
			Delta		
			McCoy Foundry		
			Mueller		
	Water Tight	OPSD 401.03, no lugs	R.B. Agarwalla		Frame to be attached to the precast section
			Sigma Corp.		
Water Tight Hinged			Mueller		Within easements, outside of ROW only
			Bibby Ste. Croix		
			McCoy Foundry		
Maintenance Hole Adjustment Units	Pre-Cast Concrete	OPSS 1853	DECAST		
			Forterra Pipe	Moduloc	
	Bibby Ste Croix		Autostable		
	Sigma Corp				
Protective Coatings	Corrosion Prevention Tape	ANSI / AWWA C-217	Denso North America Inc.	Corrosion Protection Sysem	Denso Past, Lt Tape and Profiling Mastic
			Advanced Corrosion	Petro Guard System	Paste PP04ST, Mastic PM3ST, Tape PTLT
			Petro Coating System	PCS System	PT150ST, PP04 and PM3ST
			RPH Distributors		TC Envirotape, Enviroprime and Enviromastic



APPROVED MATERIALS LIST

TOWN OF WASAGA BEACH

STORM SEWER, ROADS AND TRAFFIC

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Main Line Non-Pressure Pipe	Polyvinyl Chloride (PVC) Solid Wall 300mm ø to 375mm ø inclusive	CSA B182.2 ASTM D 3034 SDR 35 minimum Minimum pipe stiffness - 320 kPa	Ipex Inc.	Ring Tite	·Rubber gasket bell and spigot joints
			National Pipe & Plastics Inc.	Ever-Green	
	Polyvinyl Chloride (PVC) Solid Wall 450mm ø and larger	CSA B182.2 ASTM F 679 (T-1) SDR 35 minimum Minimum pipe stiffness - 320 kPa	Ipex Inc.	Ring Tite	·Fittings ASTM F679 (T-1)
			National Pipe & Plastics Inc.	Ever-Green	·Rubber gasket bell and spigot joints
	Polyvinyl Chloride (PVC) Profile (Ribbed) Wall 300mm ø to 600mm ø inclusive	CSA B182.4 ASTM F-794 Minimum pipe stiffness - 320 kPa	Ipex Inc.	Ultra-Rib	·Rubber gasket bell and spigot joints
			Royal Pipe	Korflo	
	Concrete up to and including 900mm ø	CSA A257.1, A257.2 and A257.3 (whichever applies) OPSS 1820			·Manufactured at a prequalified plant and marked with a "Prequalification Stamp" (triangular symbol)
	Concrete larger than 900mm ø	CSA A257.2 Joints - CSA A257.3 OPSS 1820			·Manufactured at a prequalified plant and marked with a "Prequalification Stamp" (triangular symbol)
	High Density Polyethylene (HDPE)	ASTM F894 CSA B182.8 Minimum pipe stiffness - 320 kPa	KWH Pipe Canada LTD	Weholite	·Corrugated outer wall and smooth interior walls (a.k.a. closed profile pipe)
			Armtec	BOSS 2000	·Pipe to be installed through MH's in a continuous fashion, as per manufacturers recommendations
ADS/Hancor			N-12 ST/WT		



APPROVED MATERIALS LIST

TOWN OF WASAGA BEACH

STORM SEWER, ROADS AND TRAFFIC

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Culvert Pipe	High Density Polyethylene (HDPE)	ASTM F894	KWH Pipe Canada Ltd.	Weholite	
		Minimum pipe stiffness 320 kPa	ADS/Hancor	N-12 ST/WT	
		CSA B182.8	Armtec	BOSS 2000	
	Corrugated Steel Pipe (CSP)	CSA G401 Galvanized (minimum) Minimum pipe thickness - 2mm	Armtec	Hel-cor	
Subdrain	Corrugated High Density Polyethylene (HDPE) 150mm	ASTM F405	ADS/Hancor	ADS Highway Pipe	
		ASTM F667	DMX Plastics	DMX FLEXTUBE	
		AASHTO M-294			
	100mm - 600mm Polyethylene Pipe	AASHTO M-252	DMX Plastics	DMX Polyethylene Storm Pipe	
Adaptor Couplings			Rollee	Kwik Coupling	
			Mission Rubber Co.	Adjustable Repair Couplings (ARC)	
			Preper-PLS	Preper	
Repair Clamps		CSA B 602	Rollee	Kwik Coupling	
			Mission Rubber Co.	Flex-Seal - ARC	
			Cambridge Brass	Series 425	
			Romac Industries	SS Repair Clamp	
Precast Maintenance Hole and Components	Concrete	CSA A257.4 ASTM C-478 OPSS 1351	Con Cast Pipe		Includes precast drop structure
			M Con Pipe & Products		
			Hanson Pipe		
			Munro Concrete		
	Pre-Benched	Same as Concrete	Con Cast Pipe		



APPROVED MATERIALS LIST

TOWN OF WASAGA BEACH

STORM SEWER, ROADS AND TRAFFIC

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Precast Catch Basins	Concrete	OPSS 1351 OPSD 702.040	Con Cast Pipe		
			Hanson Pipe		
			Monro Concrete		
Maintenance Hole Frame and Cover	Standard	OPSD 401.01 - Type A, no lugs	Mueller		
			Bibby Ste Croix		
			Sigma Corp.		
			R.B. Agarwalla		
	Water Tight	OPSD 401.03 - no lugs	Mueller		·Frame to be attached to the precast section
			Bibby Ste Croix		
Catch Basin Frame and Cover	Curb Inlet	OPSD 400.081	R.B. Agarwalla		
			Mueller		
			Bibby Ste. Croix		
	Perforated Openings	OPSD 400.100	R.B. Agarwalla		
			Mueller		
			Bibby Ste. Croix		
Maintenance Hole/ Catch Basin Adjustment Units	Pre-Cast Concrete	OPSS 1853	Munro	Moduloc	
			Hanson Pipe		
Noise Walls	Precast Concrete	CSA A23.1 and A23.4 35 MPa at 28 days (min)	International Fence Durisol Incorporated		Acoustic / noise fence to be installed in accordance with the recommendations of the Noise Impact Study.
	Vinyl		Homeland Vinyl Fence		
	Composite Systems	Concrete/Wood chip	Durisol Incorporated		
	Wood	Western Red Cedar			

Tactile Sidewalk Plates

steel

TTC12424-WS-XX

Tuftile

XX represents colour=natural

***Electrical Conduit, Handwells and all other electrical signalling components must comply to the latest OPSS and Contract documents.**



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Pipe Up To and Including 300mm Diameter	Polyvinyl Chloride (PVC)	DR 18 CSA B137.3 CSA B137.6 AWWA C900	Ipex	Blue Brute	·Rubber gasketed bell and spigot joints
			National Pipe	Dura Blue	·Installed with 12 Gauge stranded tracer wire
			Next Polymers	Aqualoc	·Joints restrained where required by design & wrapped with corrosion protective system
			Diamon Plastics Corp.	PR 235	
			Royal Pipe Systems		
Pipe 350mm to 450mm Diameter	Polyvinyl Chloride (PVC)	DR 18 CSA B137.3 CSA B137.6 AWWA C905	Ipex	Big Brute	·Rubber gasketed bell and spigot joints ·Joints restrained where required by design & wrapped with corrosion protective system
			Next Polymers	Aqualoc	·Installed with 12 Gauge stranded tracer wire
		Royal Pipe Systems		·Joints restrained where required by design & wrapped with corrosion protective system	
Pipe Diameter Larger than 450mm	Concrete Pressure Pipe up to 500mm Diameter	AWWA C301 and C304 or AWWA C303	Hanson		·Supplied with Bell & spigot joints ·Joints sealed with wrap around cement mortar diapers Shop drawings shall be supplied to the Town for review & approval prior to construction ·Restrained where required by design
	Concrete Pressure Pipe > 600mm Diameter	AWWA C301 and C304	Hanson		
			Munro		
Directional Drill Pipe Dia. Larger Than 100mm	HDPE	DR 11 AWWA C906	KWH Pipe		·Thermal butt fusion joining of pipe



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments	
Fittings	Ductile Iron Compact Fittings Short Body	ANSI A21.10 AWWA C110 Cement-mortar lined as per ANSI A21.4 (AWWA C104)	Stigma Star Bibby		·Mechanical type ends ·Polyethylene encasement shall be installed in accordance with manufacturers specification and instructions or wrapped with corrosion ·Complete with T-304 stainless steel nuts & bolts	
	Polyvinyl Chloride (PVC) up to 200mm Diameter	AWWA C907 CSA B137.2	Ipex Royal Galaxy		·PVC Fittings to have fitting pipe restrainers ·Joints restrained where required by design and wrapped with corrosion protection system ·Complete with T-304 stainless steel nuts & bolts	
	Polyvinyl Chloride (PVC) 250mm & 300mm Diameter	AWWA C907 CSA B137.3	Ipex Royal Galaxy			
	Victaulic				·Acceptable for all AWWA approved pipes excluding PVC	
Protective Coatings	Corrosion Prevention System (3 stage system)	ANSI / AWWA C-217	Denso North America	Denso System	·Denso Paste, LT Paste, Profiling Mastic Applied to all metallic fittings and components	
			Petro Coating Systems	PCS System	·PT150ST, PP04 and PM3ST	
			RPH Distributors		·TC Envirotape, Enviroprime and Enviromastic	
			Advanced Corrosion	PetroGuard System	·Paste PP04St, Mastic PM3ST, Tape PTLT	
Main Stops all brass water service fittings are 'no lead' (5 ppb) as legislated in NSF 61 Annex F, as of July 1st, 2012	19mm and 25mm	Teflon tape to be added to all listed main stops	Ford Meter Box Co Inc	FB1000-X-Q NL	·same size inlet and pack joint	
			Cambridge Brass	Series 302NL		
			Mueller Canada	H 15008 EB 2 (or FD) A223NL	·for steel pipe AWWA C202 without welded outle	
			Cambridge Brass	Series 301NL	·with compression joints	
	38mm and 50mm	Torque shall be between 37 Joules and 47 Joules (27 ft-lb to 35 ft-lb)	For non metallic pipe use main stop with tracer wire hole	A.Y. McDonald Mfg	Model 74713T Model 74701 T	
				Cambridge Brass	301-A-HE(NL)	
				Ford Meter Box Co Inc	Ballcorp FB1000-X TW-Q (NL)	·Non metallic pipe must be installed with tracer wire compatible appurtenances



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Hydrants		AWWA C502 FM approved ·Two 63.5mm diameter hose nozzles at 180 degrees ·Hose nozzle and operating nut threads in accordance with Province of Ontario Standards ·Base (boot) with 150mm mechanical connection end ·Safety breakaway flanges and breakaway couplings	Mueller Canada	Canada Valve Centur	·Installation per Town Std.Dwg.No.6
			Clow Canada	Mcavity M67B Concord D67-M	·Hydrants to be painted yellow (BEHL Chemicals No. 236 or equivalent) with silver top and caps.
			Clow-Bibby	Sentinel	·Hydrants shall be non self-draining (internally plugged)
			AVK	Dry Barrel - Model 2780	·Installation per Town Std.Dwg.No.6
					·If a hydrant extension is required to adjust the length of a hydrant barrel, it shall be obtained from the manufacturer and installed per the manufacturer's instructions.
Joint Restraints	For PVC Pipe	ASTM F1674 STD DWG 1-3-3A All completed with 304 stainless steel nuts and bolts	Star Pipe Products	PVCgrip 3500	·Installed with concrete thrust blocks (on existing pipe only) in accordance with OPS standards
				PVC Stargrip 4000	
				Allgrip 3600	·Corrosion protection system (as per specs)
				1000-C	·MJ fittings only
			Clow Canada	Series 90	·Flange Adapter
				Series 300, 350, 360	·Restrainers
			Smith-Blair	111 & 120	
			Sigma Corp	PV-Lok Series PVM, PVP, and PVPF	
				One-Lok SLC	
			EBAA Iron Sales Inc.	Megalug Series	·1500, 1600, 2000, 2600
			Romac Industries Inc.	Grip Ring	
Ford Meter Box Co. Lt	UniFlange Series 1300C	·PVC pipe used with Mech Joint/Push-On Fittings			
	UniFlange Series 1350C	·For PVC pipe bell joints			
	UniFlange Series 1500C	·MJ retainer gland joint restraint			
Connectors	For Tracer Wire	approved for direct bury	Klick-It II -PCS Ltd	Model C8816	·Connectors shall be used on all non-metallic watermains, hydrant laterals and non metallic water services
			Dryconn King Innov.R	Blue (lug Type)	



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Couplings	Transition Couplings	Complete with T-304 Stainless steel nuts and bolts	Dresser Piping Specialties	Styles 53 and 153	·all wm couplings must be self restrainer type or installed with approved restrainers
				Style 38	·for 400mm watermains and larger
			Cambridge	Model 3501	
			Smith-Blair Inc.	Model 441	
			Victaulic Co. of Canada Inc.	Style #44	
				Style #31	·Ductile housing with grade "M" gasket
			TPS-Cromer Ind Corp	Hymax 2000 Flexible	·to be installed with split-ring restrainer/tie-rods
			Robar Industries	1406	
			Straub Tadco Manufacturing	Straub Flex/Open	
				Straub Grip	
	TPS-Cromer Ind Corp	Hymax (Large Dia)	·to be installed with split-ring restrainer/tie-rods		
	Ford Meer Box Co. Ind	FC1, FC2	·to be installed with approved restrainers		
		RCP-PP-x	·restrained coupling, PVC x PVC		
	Romac Industrial Inc.	501 straight transition coupling			
	YNC Pipe Couplings In	YNC Pipe Couplings	·all stainless steel		
	Flanged Couplings	Complete with stainless steel nuts and bolts	Smith-Blair Inc.	Model 912	
			Dresser Piping Spec.	Style 127	
			Viking Johnson	MaxiDaptor	
			Robar Industries	7406	
			Victaulic Co. of Canada Inc.	#341.2	·Ductile housing with grade "M" gasket
FCA 501					
Clow Canada			Series 90C	·for PVC pipe	
			Series 40C	·for DI pipe	
Insulating Couplings		Smith-Blair Inc.	Model 416		
Tapped Couplings	AWWA C800	Robar Industries	1406	·complete with insulating boot	
		Ipex	Blue Brute Tapped Coupling	·150mm to 200mm PVC watermains in 19mm to 50mm service sizes, restrained	



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Valves	Gate Valve < 100mm diam.		Crane		·Rising spindle ·Installed in above ground applications or in chamber only
	Gate Valve 100mm - 200mm diam.		Mueller Canada	A-2360	
			Clow Canada	F6102	·T-304 stainless steel nuts & bolts, corrosion protection system
	Resilient Wedge Gate Valve	100mm to 300mm dia. Inclusive AWWA C509	AVK	Series 25	·T-304 stainless steel nuts & bolts, corrosion protection system ·Open left (counter clockwise) ·50. mm square operating nut
			Clow Canada	2639/2640	
			Mueller Canada	A-2360	
		350mm dia. and larger AWWA C515	Kennedy Valve	Ken-Seal	·Inside non-rising stem
			J & S Valve	Series 6600, 6800, 6900	
			AVK	Series 25, 45	·Fusion Bonded Epoxy (FBE) Coated
	Check Valve		Mission	Duo-Check series 125	·T-304 stainless steel nuts & bolts, corrosion protection system ·Not to be used for backflow prevention unless two inline & certified for that purpose
			Mueller Canada	A-2600	
			Val-matic	Swingflex	
			Clow Canada	Kenflex #506	
	Detector Check Valve	AWWA C508 suitable for continuous submerged conditions	Viking/Automatic Sprinkler	Model E-1	·All DCV to have min 25mm bypass port outlets
			Mueller Canada		·100mm to 250mm inclusive
			Watts	Series 07-F	·100mm to 250mm inclusive
	Tapping Valve		Mueller Canada	T2360	·100mm diameter and larger ·All taps done by Town of Wasaga Beach
				A2360	
			AVK	Series 25	
			Clow Canada	F6114	
Pressure Regulating Valve		Cla-Val	Series 90	·Model to be approved on a site specific basis	
		Singer	106-PR, 206-PR	·Provided with filter canisters ·Provided with stainless steel rings	
Flow Control Valve		Cla-Val		·Model to be approved on a site specific basis	
		Singer		·Provided with filter canisters	
				·Provided with stainless steel rings	



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments	
Air Valves	Air Release	AWWA C512	Vent-O-Mat	RBX	Vented	
			Apco	143C, 145C, 149C Threaded		
			Val-Matic	201C, 202C, 203C Threaded		
			Crispin	UL 10.1, UL20.1, UL 41.1		
	Air/Vacuum Release		A.R.I.	D-040P D-040CV		
			Air Release Backflow Preventer		Val-Matic	Floodsafe
Backflow Preventer			Watts	Series 900 or 9D	·above ground chamber in accordance with Town Std.Dwg.No. 15	
			Cla-Val	Model 3 or R.P.		
			Febco	825Y		
Repair Clamps		All repair clamps to be supplied with stainless steel (passive 304) nuts and bolts	TPS-Cromer Ind Corp	Ex-max Repair Clamp	·all stainless steel-full seal	
			Robar Industries		·all stainless steel	
			Mueller Canada		·all stainless steel	
			Cambridge Brass	Teck	·with taper gasket	
			Straub-Tadco Inc	Straub Clamp		
			Romac Industries	LSS1	·1 piece with full seal	
			YNC Pipe Couplings Co		·all stainless steel	
			Clow Canada	Concord D76R Series 200		
			Bell Joint Repair Clamps	Smith-Blair Inc	274	
				Romac Industries	516	
				Dresser	60 and 160	



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Tapping Sleeves (taps to be done by certified installer/welder per Town acceptance)	PVC Pipe	All tapping sleeves to be supplied with stainless steel (passive 304) nuts and bolts	Robar Industries	6606	·with full liner
			Ford Meter Box Co. In	Ford "Fast"	·all stainless steel
			Romac Industries	SST	
			Smith-Blair Inc	663	
			Mueller Canada	H304	
			Romac Industries	6606	·with full liner
	DI and CI		Ford Meter Box Co. In	Ford "Fast"	·all stainless steel
			Romac Industries	SST	
			Smith-Blair Inc	663	
			Mueller Canada	H304	
				H613	Ductile iron only
			Asbestos Cement pipe (rough barrel)	Mueller Canada	H304 SS
				H619	·300mm and larger
	Robar Industries			6606	·with full liner
	Romac Industries			SST	
	Ford Meter Box Co. In			Ford "Fast"	·all stainless steel
TPS-Cromer Ind Corp	Ez-Tap plus serv/sad	·all stainless steel			
Concrete Pressure Pipe	Smith-Blair Inc	663			
			·spec to CPP C-301 or C-303		

Water Service 25mm - 50mm	Copper	Type K Soft Copper ASTM B88-49			
	Polyethylene	AWWA C901 CSA B. 137.10			·Stainless steel inserts required, in accordance with manufacturers recommendations ·12 gauge TWU stranded copper, light coloured plastic coated tracer wire to be installed with non-metallic pipe. Main stops, curb stops and service boxes must be designed to specifically accommodate TWU. (see Type for detailed info)



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Service Saddles (must be double bolt, for all service taps)	PVC Class 150		Clow	D72	
			Romac Industries	306 double bolt	
			Robar Industries	2706 double strap	
			Smith-Blair	323	
				373 s.s. with band	
			Cambridge Brass	403 Broad Band	
				3412AS	
	3416AS				
	Continental Ind	PVS Fast Tap			
	PVC Class 160, Series 100		Clow	D72	
			Mueller Canada	H13428	
				H13431	
				H13433	
			Robar Industries	1606	
				2606	
			Cambridge Brass	403 Broad Band	
				3412AS	
				3416AS	
			Romac Industries	306 double bolt	
	Concord Daigle	D71			
	Smith-Blair	373			
Continental Ind	PVS Fast Tap				
C.I. and D.I.		Clow	D72		
		Robar Industries	406	·with s.s. bales	
		Smith-Blair	313	·with s.s. bales	
		Romac Industries	306 double bolt		
		Cambridge Brass	403 BroadBand(Teck)		
			3412AS		
	3416AS				



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Service Saddles (must be double bolt, for all service taps)	Asbestos Cement Pipe (existing pipe only)	Manufactured to AWWA C301, C303 and C304 Welded outlets are to be as per pipe manufacturers recommendations	Smith-Blair	323	·ACP not permitted for new pipe installation
			Romac Industries	306 double bolt	
			Cambridge Brass	403 BroadBand(Teck)	
			3412AS		
			3416AS		
	Concrete		Smith-Blair	362	·T-304 stainless steel nuts and bolts
Curb Stops	19mm to 50mm must be 'no lead' (5 ppb) as legislated in NSF 61 Annex F as of July 1, 2012	Compression type - Stainless steel ball style	Ford Meter Box Co Inc	B44 Series NL	·Non metallic pipe must be installed with tracer wire compatible appurtenances
				Z44 Series NL	
				BH 44-233G NL	
				4713T NL	
			Mueller Canada	H 15207N	
				H 15209N	
			A.Y. McDonald	Model 76100T	
				74713T	
			Cambridge Brass	202NL	
	For non metallic pipe use Curb Stop with tracer wire insert	Cambridge Brass	202-H-HE NL Series		
		Ford Meter Box Co Inc	B44-XXX-TW-Q-NL		



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Service Box		To be supplied with stainless steel rod and brass cotter pin for 1.52m to 1.83. bury, use rod 1.14m long. Extension required if special depths are encountered (as per manufacturers recommendations).	Mueller Canada	A726	·19mm - 25mm
				A728	·40mm- 50mm
			PCHG	D2N	·40mm- 50mm
				D1N	·19mm - 25mm
			Clow Canada	D1	·19mm - 25mm
				D2N	·40mm - 50mm
			Bibby	VSB1	·19mm - 25mm
				VSB2	·40mm - 50mm
			R.B. Agarwalla & Co		
			Sigma Corp	#8	
			Star Pipe Products	SB-5001	·19mm - 25mm
				SB-5002	·40mm - 50mm
			For non metallic pipe is Service Box with tracer wire hole	Ford Meter Box Co Inc	Curb Box EM2-XX-5X-TW
Casing Spacers		T-304 Stainless Steel	Cascade	CCS-1320-8	·Ultra high molecular weight polymer runners (or equivalent) ·Position of pipe within liner to be centered & restrained, sufficient to provide no less than 19mm clearance between stainless steel bands and glass polymer runners ·Watermain restrained laterally for the entire length of the liner ·Sealed using wrap around rubber ends complete with stainless steel (T-304) banding
			Cambridge Brass	Model 4810	
			Utility Supply Corp	SS1	
			CCI Pipeline Systems	CCS8 and CCS12	



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

WATERMAIN

Product	Type	Specifications	Manufacturer	Description /Model	Comments
Precast Chamber and components	Concrete	CSA A257.4 OPSS 1351	Con Cast pipe		
			M Con Pipe & Prod.		
			Hanson Pipe		
			Munro Concrete		
Chamber Frame and Cover	Standard	OPSD 401.01 - Type A, no lugs	Bibby St. Croix		·Cast iron, square frame with circular closed or open cover
			Delta		
			McCoy Foundry		
			Mueller		
			R.B. Agarwella		
	Water Tight	OPSD 401.03, no lugs	Sigma Corp		·Frame to be attached to the precast section
			Mueller		
			Bibby St. Croix		
Water tight hinged		Saint-Gobain PAM	Pamrex	·Within easements, outside of ROW only	
Chamber Adjustment Units	Pre-cast	OPSS 1853	Munro		
	Concrete		Hanson Pipe	Moduloc	
Anodes	High Potential Magnesium	ASTM B843 14.5 kg 3m AWG#12 solid copper wire	ICCC	32D5GG	
			Exothermal Ind.	MA-32	
			Bren Tech		
			Maple Agencies		



**APPROVED MATERIALS LIST
TOWN OF WASAGA BEACH
TRAFFIC SIGNAL CONTROLLER BOX**

Nema ts2type2 ma 8ph. cabinet assembly

- . M- aluminum cabinet, polyester powder asa70 grey, c/w 2 shelves(1 with slide out tray) c/w neo preen gasket. Vertical shelf support channels shall be provided to permit adjustment of shelf location in the field (keyhole slots are not permitted)
- . Main door lock #2 c/w2 keys, police door lock c/w 1 long key
- .disposable air filter c/w aluminum plate
- . Exhaust Fan c/w guard, 250 watt heater c/w guard and adjustable thermostat controls
- .trouble lamp c/w switch
- . GFI receptical

Wiring

All wiring within the cabinet shall be neat and routed such that opening and closing the door or raising or lowering the back panel will not twist or crimp the wiring. Harnesses shall be either braided, sheathed in nylon mesh sleeving, or made of PVC or polyethylene insulated jacketed cable.

Cabinet wiring shall include a Novax DS3000 APS unit wired to all pedestrian Phases (2,4,6,8) within cabinet, DS3000 units are to be mounted in a suitable location. The internal speaker shall be disconnected, speaker wires to be terminated to spare terminal strip labled "external speakers"

12 position 12 channel ts2 type2 back panel assembly

The back panel shall be wired for a standard NEMA 8-phase operation . Diodes shall be installed to prevent the traffic controller from re-servicing left turn phases from corresponding thru phases.

Load switches 1,3,5,7 shall be wired for fast flash left turn movements.

Load switches 2,4,6,8, shall be wired for thru movements.

Load switches 9,10,11,12 shall be wired for pedestrian movements 2,4,6,8.

Emergency flash shall be wired for red/red flash

The backpanel shall incl. the following componants.

- .NEMA Standards Publication TS 2-1992
- .12ea N.E.M.A. Model 200 load switch
 - .1ea N.E.M.A. Model 204 flasher
 - .4ea flash xfer relay
- . 40a Power supply panel c/w plexi-glass cover
 - .2ea. circuit breakers, 15A aux and 40A main
 - .radio frequency interference (RFI) suppresser
 - .A 50 Amp, solid state relay
 - .lightning/surge supressor
 - .12 position detector rack, wired for:
 - . 8ea.-2 channel det.

- . 1 ea.-2 channel pre-empt
- . 1 ea.- spare
- .1 ea. 24v power supply
- .Field input panel
- .All inputs - 16 vehicle 4 pedestrian and 2 pre-empt shall be wired to a field input panel with sufficient terminals to accommodate all input wiring plus 1ea. 12pos. Spare terminal block labeled "external speakers"

The detector rack shall incl. the following components:

- 4 ea. 2 channel detector cards(EDI LMD602TR or approved equal).
- 1 ea. 24vdc power supply (EDI PS175 or approved equal).
- 1 ea. Tomar model 2070-2spm pre-empt card(or approved equal)

(Note: alternate pre-empt cards must be supplied with detectors to provide 2 channels of pre-empt)

.aux. i/o harness

1ea. Aux. i/o harness terminated to a 72pos. Interface panel c/w plexi-glass cover. The harness is to be configured for a Naztec model 980ts2type 2 controller operating TX2-V14 pin assignment.

.test switch panel c/w cover

- . 8 veh. 4 ped. 2 pre.empt (on-off-momentary)
- .auto/stoptime, auto/flash, interval adv. Pushbutton

.police door switches

signal on/off, auto/manual. Signal/flash, retractable (int. adv.) police cord.

.conflict monitor

1ea. 12 channel NEMA conflict monitor complete with event logging and LCD display capable of recognizing fast flash signal operation, per channel. (EDI SSM12LE-CAN or approved equal)

.traffic controller

1ea. Nema 8 phase traffic controller
c/w AUX I/O harness fully wired to a termination panel.

Traffic UPS installed in Controller Cabinet External Piggybacked battery enclosure consisting of:

Model# 017-230-23 FXM 1100, UPS, 120VAC In / Out, 48VDC, SNMP, F/W1.7 or later
Flash mode point customer adjustable

Model# 740-756-21 Wall mounting Kit-ATS/GTS MBP(different mounting kit maybe required for Alpha S6)

Model# 020-165-21 UATS, 120V, 30A, Novus ATS w/ continuous load
Operates in UPS mode, with fail safe automatic transfer to utility if UPS failure

Model# 181-230-10 195GXL-HP Battery, 12V, 100Ah, Gel Cell, Top terminal, Silver Alloy

Alpha S6

Outdoor Enclosure Grey consisting of:

1 x 189-208-10 Battery Heater Mat
(1 x Master, 2 x Slave)
1 x 033-078-20, Enclosure
1 x 020-098-24, Plug-in lightning arrestor
1 x 189-209-10, Battery Heater Mat (1 x Slave)
1 x SP96-022-94, Battery Cable Kit

OR ACCEPTED EQUIVALENT

A qualified traffic technician (I.M.S.A. level 2 field cert.) shall be present for the duration of all equipment setup/programming and testing on day of turn on.



APPROVED PRODUCTS LIST

TOWN OF WASAGA BEACH

STREETLIGHTS

PRODUCT	MATERIAL TYPE	SPECIFICATION	DISCRIPTION	MANUFACTURER	CATALOGUE #	COMMENTS
POWER SUPPLY EQUIPMENT						
In-Line Fuse Holder		OPSS 614	Break-away	Thomas - Betts	RE-8MA	
Fuses		OPSS 2414.05	250V-15A	Mersen Canada Toronto Inc.	OTM15, J216737	
STREETLIGHT POLES						
Direct Buried Poles	Concrete	OPSS.MUNI 2421 OPSS.PROV 2421	Octagonal Tapered, Black Eclipse colour, Polished finish, 2 coats of acrylic paint on full length of pole. Complete with FIN CAP	Utility Structures Inc.	MA-300-C-2-BE-10-F	9.14 metres (30 feet) pole overall length All poles shall have provision for #6A WG CU electrical ground.
				Stresscrete Group	E220-CPO-G-S11	The manufacturer's catalogue number shall be as indicated on the Contract Drawings. These poles shall be complete with pole cap, handhole for underground wiring and handhole cover.
LUMINAIRES						
Roadway Lighting Type	Housing constructed of high strength, lightweight bulk molding compound. UV stabilized polymeric door	2432-05-02	LED IES, Product Series RSW, Cobrahead Style, Mounting: Horizontal Tenon, CCT/CRI: 3000K/70CRI, Voltage: 120V, Colour: Black, Utility Label/Receptacle: Utility Label and NEMA 7-Pin Photocell Receptacle, Locked Lumen Output	Cree Lighting	RSW**.-HT-***.-**-30K7-UL-BK-N-X*	<ul style="list-style-type: none"> - All luminaires shall have zero degree tilt and have the socket position factory set. - Specific fixture type must achieve the performance specifications as defined in the supporting IES file and ANSI/IES RP-8 Roadway Lighting ANSI Approved - Illuminating Engineering Society of North America (IESNA). Further, Dark Sky Friendly, IDA Approved - Each fixture shall be, prewired to operate at 120 Volts, C.S.A. approved, with 10kV surge suppression protection tested - Luminaires shall be equipped with photocell control receptacle, ground lug and photocell. - 10 year Warranty
PHOTOELECTRIC CONTROLLERS						
Photoelectric Control	Photocell	OPSS.MUNI 2485 OPSS.PROV 2485	Control Relay: 120 V, 60 Hz (105-130V range). Contacts: SPST N.C. rated 1800 W HPS. Enclosure: Weatherproof case, complete with plug to fit EEI-NEMA ANSI C136 compliant.	SunTech	TRS-2-CUL	Turn-on Level: 1.0 foot candle – normal; factory set. Turn-off Level: 3.0 foot candles – average. Lighting Arrester: Open type – 2.5 kV spark over minimum 5000 Amp follow through. Rated Life: 10-year design minimum at rated load.
BRACKETS						
Fixture Bracket (Arm) Type	Aluminum	OPSS.MUNI 2428 OPSS.PROV 2428 OPSD 2250.010	Tapered Elliptical, Textured Black (powder coated),	Stresscrete Group	KA120-A-S-1-6'	6 feet long with 32 inch rise
					KA120-A-S-1-8'	8 feet long with 39 inch rise
					KA120-A-S-1-10'	10 feet long with 47 inch rise
					KA120-A-S-1-12'	12 feet long with 60 inch rise
				Utility Structures Inc.		Same specifications as listed above

Proposed Equivalents must be approved through the Town's Approved Product Application process.

APPENDIX H

Park Standards



WASAGA BEACH PARKS STANDARDS

March 2021

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EXECUTIVE SUMMARY

The Wasaga Beach Parks Standards was created by the Public Works Department of the Town of Wasaga Beach to define the requirements and standards for municipal parkland development. This document shall guide the design and construction of public parks, whether completed by the Town of Wasaga Beach or by the development community.

The Wasaga Beach Parks Standards shall not be a static document and the information contained herein is subject to change without notice. It is the intent of the Public Works Department to update these standards as required to comply with applicable federal and provincial regulations, municipal policy and by-laws, and the most recent industry standards and guidelines as they relate to parks and recreation facilities/amenities, accessibility, and public health and safety.

The standards should be used in conjunction with other planning policy, engineering standards, and guidelines referenced throughout. The goal is to guide the process of submitting or reviewing a development application within the Town of Wasaga Beach and to inform individuals of parkland requirements. The reader must ensure that they have the most current version of these standards and all other documents referenced therein.

PART 1 PARK PLANNING & GENERAL GUIDELINES

1.1 INTRODUCTION

The Parks & Trails Master Plan (December 2020) defines ‘Parkland’ as:

“all lands owned, leased and/or managed by the Town and classified as Community Parks, Neighbourhood Parks, Parkettes and Urban Plazas. Parkland typically consists of tableland suitable for the development or installation of built recreational or civic amenities (such as sports fields, playgrounds, courts, gardens, etc.) that may be used for both organized and unorganized activities, although these parks may also incorporate natural features”.

The Park Standards focuses specifically on the development of parkland within the Town of Wasaga Beach and outlines key requirements and expectations for the following:

- Allocation and planning of parkland through the planning process (Draft Plan);
- Minimum parkland requirements for municipal assumption under the Development Agreement;
- Park development process for the design and construction of public parks and associated amenities (3-options);
- Minimum design, construction, and technical standards;
- Parkland drawing requirements.

This document does not address standards or requirements for the design and development of public open spaces (e.g., natural areas, open space linkages, etc.) or trails. Requirements for open spaces and trails will be defined on a case-by case basis to suit specific site and environmental conditions and community needs.

1.2 PARKLAND DEDICATION

For new subdivisions, parkland dedications will be determined through the Draft Plan of Subdivision in accordance with the requirements of the Provincial Planning Act, the Town of Wasaga Beach Official Plan, and Comprehensive Zoning By-law 2003-60. Parkland calculations and requirements in this regard will be determined by Planning and Development Services through the Town’s formal development application process.

Park classification will also be determined through this process to guide the siting and configuration of parkland within the community in context of its intended uses, facilities, and amenities. Classification and intended recreational uses will be in response to recommendations made through the Parks & Trails Master Plan (December 2020), Wasaga Beach Parks, Facilities and Recreation Master Plan (2012), or any other guiding document applicable in this determination.

If it is determined that the parkland facilities, uses, or programming anticipated for a given neighbourhood or the greater Wasaga Beach community requires land that exceeds the calculated parkland dedication, the Town may choose to acquire the balance needed. This land will be subject to the same performance standards as the surrounding conveyance and developers shall be responsible to ensure that the lands are free of encumbrances, fully prepared as described herein and in a condition acceptable to the Town.

1.3 PARK CLASSIFICATIONS

The Parks & Trails Master Plan proposes classifications to provide a framework for park planning and policymaking. It also provides a general list of potential amenities that are suitable for each park classification type.

The Wasaga Beach Parks Standards support and recognize the Master Plan classifications, which are as follows:

COMMUNITY PARKS

Community Parks are used by groups of residents and tourists for community events, festivals, and active recreation. They may contain athletic amenities for organized recreation (such as sports fields, support buildings, and community-wide recreation amenities), as well as pathways, pavilions and/or unique elements that make the park a 'destination'. Full services (water, sanitary, etc.) are generally required.

Community parks should have good transportation access along adjacent arterial or collector roadways and provide adequate parking to meet anticipated demand. Community Parks in urban areas should be appropriately located along transit routes.

Community Parks serve a Town-wide area and beyond and are to be provided at a rate of 2.11 hectares per 1,000 population, with a target size of 4.0 hectares or more.

Example: Wasaga Sports Park

NEIGHBOURHOOD PARKS

Neighbourhood Parks primarily support children's play activities and are often situated within subdivisions to promote walkability. Neighbourhood Parks contain playgrounds, local-level play features, and/or passive open space intended to serve the immediate area. Unlike community parks, most do not have off-street parking, though they may be coordinated with school sites.

Neighbourhood Parks serve the surrounding neighbourhood (800-metre radius) and are provided at a rate of 0.41 hectares per 1,000 population, with a target size of 0.5 to 4.0 hectares.

Example: Wasaga Village Park



PARKETTES

Parkettes are generally smaller and less developed than neighbourhood parks. Their primary purpose is to provide access to green space and respite for nearby residents and travelers. They may contain seating areas, pathways, floral/ornamental gardens, shade trees, etc. Most will not contain playground equipment unless there are no suitable options nearby.

Parkettes serve a localized area (500-metre radius) and are provided at a rate of 0.07 hectares per 1,000 population, with a target size of 0.5 hectares or less.

Example: Golfview Park

URBAN PLAZA

Urban Plazas are publicly-owned lands that are located in highly visible and accessible locations, typically in gateways or higher density urban areas. They serve to support the Town's social and cultural fabric, create a sense of place, and may contain elements of historic or cultural significance that are of local importance. They are typically characterized by hardscaped areas for events and gatherings, public art, seating areas, related civic uses, etc.

Urban Plazas serve a Town-wide area and are provided at a rate of 0.01 hectares per 1,000 population, with a target size of 0.5 hectares or less.

Example: Beck Square; planned park in Sunnidale Trails (Pacific Homes/Rivers Edge)

1.4 PARK PLANNING CHARACTERISTICS

Further to policy objectives such as land area, classification, and intended uses, the layout and placement of parkland blocks within the overall development plan is critical to the successful realization of healthy, integrated, and sustainable communities. Parks should be located as defining community features that unify the community and are integrated as focal destinations within an interconnected pedestrian and active transportation network. Draft Plans for developments should be structured around the parkland as a central activity node, reinforcing the center as a symbolic and spatial heart of the neighbourhood.

Although it is recognized that the design of each community is influenced by various factors, generally the Draft Plan should demonstrate parkland blocks that achieve the following objectives:

- Lot patterns and road and pedestrian/trail networks should be designed to place parkland in prominent site locations to create visual and physical focal points within the community (corner or focal sites, mid-block locations, etc.);
- Park blocks should be located to provide convenient and accessible pedestrian access, servicing community areas consistent with that defined by their specific park classifications;
- Where possible, parks should be located adjacent to natural features (e.g., watercourses, water bodies, forested areas, etc.) and naturalized SWM facilities to provide greater green space impact;
- Similarly, parkland should also be located adjacent to community institutions (e.g., schools, civic buildings/sites, places of worship, etc.);
- Community Parks shall have a minimum of 120m of street frontage on at least one side with additional walkway connections (blocks or easements) to other nearby streets or community nodes/housing clusters;

- Park parcels with square or rectangular configurations are preferred as they provide the most versatility for incorporation of public amenities, particularly sports facilities. Parks with odd shapes will not be accepted, unless approved by the Town based on design merit;
- Mid-block pedestrian crossings may be required to access parks where appropriate to ensure direct access from walkways, trail easements, and other pedestrian connections;
- Micro-climatic conditions should be considered and managed through park orientation and relationships between natural and built features as much as practical, to maximize and balance sun/shade opportunities and to provide shelter from winds and winter conditions;
- Parks should be located to permit convenient access from public road allowances for maintenance operations.

The following parkland conditions are not considered acceptable under any circumstances:

- Parkland dedications shall not be the result of awkward portions of the lot fabric that could not be developed into marketable residential or commercial properties;
- Blocks with odd shapes and excessive grades will not be accepted as parkland;
- Parks shall not be hidden from view from the street or neighbouring uses;
- Parkland shall be conveyed to the Town free of any physical encumbrances above/below grade;
- Easements in favour of the Town or local utilities creating limitations on the development of functional public space shall not be considered a component of the parkland calculation;
- Stormwater management ponds (SWM Ponds), valley lands, or floodplains are not acceptable as parkland dedication due to the inherent restrictions on development that are encountered on these land types.

1.5 FACILITY FIT

Parkland shall possess sufficient shape, configuration, size, and topography to accommodate the intended parkland program and design objectives. As a component of the Draft Plan of Subdivision process, the Town may define the required objectives and user programming for the park blocks and the developer will be required to prepare a Facility Fit Plan to demonstrate that the proposed parkland can accommodate these requirements.

The Facility Fit Plan is generally a park concept plan intended to demonstrate that the parkland dedication is of a sufficient size and configuration to accommodate the required park amenities/facilities, grading, drainage, facility setbacks, fencing, and other requirements. The plan also serves to identify any conflicts between desired facilities, the proposed park parcel's size and configuration, and neighbouring land uses for the Town and developer to resolve early in the development process.

The Facility Fit Plan shall generally demonstrate the following:

- Tree preservation addressed in accordance with the Draft Plan Conditions and other related Town or regulatory authority requirements in this regard;
- Park configuration and size suitable to accommodate intended recreational facilities/amenities;
- Required setbacks accommodated between active recreational facilities/uses and to buffer against neighbouring properties and roadways;
- Orientation, layout and grading of facilities/amenities meeting Town standards;
- Anticipated grading and drainage for the park conforming to the overall engineering stormwater drainage plan approved for the subdivision;
- Required services for the future construction of the park verified and generally located;
- Surface and sub-surface stormwater and sanitary drainage systems (where applicable)

accommodating the predicted needs of the park development;

- Encumbrances identified (easements, utility corridors, etc.)

A Class C cost estimate may be required at this stage to confirm that sufficient capital is available to fulfill the requested park program through allocated development charges or other financing sources. The need for a budgeting exercise will be determined by the Town on a case-by-case basis.

Following approval of the Facility Fit Plan by the Town, associated Draft Plan Conditions would be developed to ensure that the integrity of the expressed objectives is maintained throughout the subdivision's engineering design and development approvals.

1.6 PROFESSIONAL PARK DESIGN SERVICES

All park planning, design and construction oversight shall be completed by a landscape architect who is a full member in good standing with the Ontario Association of Landscape Architects (OALA) with Seal and Certificate, who shall be responsible for the preparation of drawings and specifications to the satisfaction of the Town.

PART 2 PARK DEVELOPMENT

2.1 MINIMUM PARK DEVELOPMENT REQUIREMENTS

As a component of the Subdivision Agreement, all new parkland developments shall be designed and developed to meet the minimum standards required by the Town of Wasaga Beach Engineering Standards. A summary of these minimum requirements is as follows:

- Graded to provide positive surface drainage, with care given to preserving the root systems of existing trees to remain. Minimum grades for parkland shall be 2.0% for turfgrass areas.
- Parkland trees shall be preserved and protected unless removals are necessary to accommodate the overall grading/servicing design and/or as formally directed and approved by the Town.
- The entire park shall have or receive a minimum of 150mm of topsoil, unless deeper topsoil profiles are required by the Town for special features (pond embankments, naturalized areas, etc.)
- All high-use areas of parks shall be sodded. Select areas may also be considered for seeding (hydro-seeding and/or terra-seeding) at the discretion of the Town (e.g., naturalization areas, no-mow areas, etc.)
- All public to private property interfaces shall be fenced with 1.5m high black vinyl chain-link fencing. Park frontages along streets and boundaries shared with schools, open spaces, or stormwater management facilities do not require fencing, unless required by the Town.
- NEIGHBOURHOOD PARKS: install services to park block from the road allowance as follows:
 - 25mm diameter water supply line with curb stop;
 - single phase electrical supply line from a local transformer.
- COMMUNITY PARKS: install services to the park block from the road allowance as follows:
 - 150mm diameter water supply line with valve at property line;
 - sanitary sewer stub, including manhole or inspection port at property line;
 - 3-phase electrical power.
- For all park types, the developer is required to provide an appropriately sized storm sewer outlet in the form of a ditch inlet, catch basin, or stormwater management pond. Connections from these structures to the surrounding storm sewer system shall be set at an invert elevation low enough to positively drain the entire park block.
- Where a Community Park has two or more street frontages, all or some of these services are to be provided at each park frontage, as confirmed with the Town.
- All services shall be stubbed and clearly marked with a permanent monument at ground level.

In some instances, natural gas and/or telecommunication utilities (Rogers, Bell, etc.) may be required to service specific facilities or amenities within a park. This would typically be associated with Community Parks, where recreation centres, arenas, or other municipal buildings/facilities may be integrated into public parkland. The need for such utility infrastructure will be assessed on a project-by-project basis, as determined by the Town.

2.2 PARKLAND CONVEYANCE

At a minimum, parkland will be completed as per the requirements of Section 2.1 and will be conveyed to the Town at the development's assumption stage under the Subdivision Agreement.

In some specific instances, earlier parkland conveyance may be requested as a result of advanced Town priorities, community pressures for parkland/amenities, or other factors. In these instances, the terms and responsibilities associated with early parkland conveyance will be determined in collaboration with the developer.

As part of the terms of early conveyance, the Town may require the developer to complete servicing, fencing, and rough grading and transfer the park in a pre-graded condition. This would occur at an appropriate time to correspond with the mobilization of the Town's park contractor. In this scenario, all outstanding development 'securities' for items not completed under the Subdivision Agreement (e.g., topsoil, sod, etc.) would be retained by the Town and applied to the same work under the Town's park contract. This transfer would be negotiated in context of ensuring that duplicate work and unnecessary throw-away costs are minimized. Pre-grade condition would typically be set at 150mm below finished grade, which is the depth determined by the unplaced topsoil.

If it is preferred by both the developer and Town that parkland be completed by the Developer, then the 'Developer Design-Build' option (Option 2) outlined in the next section should be followed. Under this option, development assumption would include the fully completed park works in accordance with the parkland agreement established with the Town.

2.3 PARK DEVELOPMENT OPTIONS

There are three possible parkland development approaches available for consideration. Two are focused on the transformation of 'park blocks' into active and engaging public parks with passive and

recreational amenities and community focused spaces. The third recognizes that not all developments are appropriate for the inclusion of parkland and provides an option to omit park blocks. The preferred parkland approach applied to any given development will be at the sole discretion of the Town.

Available parkland options are as follows:

OPTION 1: Town Design & Implementation

OPTION 2: Developer Design-Build

OPTION 3: No Park Block

2.4 OPTION 1: TOWN DESIGN & IMPLEMENTATION

Option 1 is the most common and preferred approach in the Town of Wasaga Beach. Under this approach, the developer will fulfil the minimum parkland requirements as outlined in Section 2.1 and will transfer ownership and responsibility of the park block to the Town through the assumption process defined by the subdivision agreement. At a time when deemed appropriate, the Town will proceed to retain consultants to design the park to meet the needs of the community and to oversee its construction implementation.

Parks are developed using applicable development charges and/or other available budgets or funding opportunities approved by Council and deemed necessary to meet public needs. As a result, the timing of park development under this approach can take longer and are typically triggered by the occupancy of a certain percentage of the new community. Parks will generally be constructed by the Town based on budget and demand.

The advantage of this approach is that designers have access to the community that the park will service (residents, stakeholders, and future users). As a result, further to needs expressed through guiding planning documents, the design programming and amenities can be developed in collaboration with local residents through a public engagement process.

This process ensures that the results capture the needs, preferences, and desired activities of the community, based on an understanding of actual neighbourhood demographics (e.g., age distribution, cultural diversity, socio-economic factors, etc.)

Furthermore, the ‘process’ of engagement and design can also have extended community-building benefits, as residents collaborate on ideas, becoming invested in the outcome, and ultimately take ownership of the public space. This can forge on-going neighbourhood relationships and increase community stewardship of the park (e.g., reduced vandalism, reporting of issues, etc.)

The following provides a general summary of the respective roles and responsibilities for parkland development under Option 1.

DEVELOPER’S MINIMUM RESPONSIBILITIES

- Planning Documentation
- Draft Plan of Subdivision (Program Development, Facility Fit Plan, Draft Plan Conditions)
- Subdivision Agreement
- Drawing Submissions (Minimum Park Requirements - see Section 2.1)
- Construction and Assumption (Minimum Park Requirements - see Section 2.1)

TOWN RESPONSIBILITIES

- Facility Fit Plan for Future Park
- Capital Budgeting
- Park Design Development (Public Engagement, Concept Design, and Functional Plan of Facilities)
- Detailed Park Design (Construction Drawings and Specifications)
- Tendering
- Park Construction

Detailed expectations for each of the above responsibilities will be determined in the early stages

of the Town’s planning and development review process, based on project specific requirements, objectives, and budgets for park development.

2.5 OPTION 2: DEVELOPER DESIGN-BUILD

Under Option 2, the developer retains designers and contractors to design and implement the parkland as a component of the developer’s responsibilities under the subdivision and parkland agreements. As this is done in advance of the development, the design is completed in absence of end-user input. As such, the design program is based on the Town’s guiding planning documents, contemporary recreational trends, anticipated needs/amenities defined by the Town, and general best practices.

The advantage of the developer design-build approach is that parks can be completed early in the implementation of a new subdivision, to deliver usable parks and recreational amenities to early residents. Furthermore, the developer’s early investment in parks can serve to present a complete neighbourhood product to potential homebuyers to drive sales.

Option 2 is available only if both the developer and Town agree that the developer will undertake the design and construction of the park on behalf of the Town. Such an option may be negotiated with the Town if it is deemed advantageous for the subdivision developer and does not impose undue additional administrative or operating costs on the municipality.

Through this option, the Town re-imburses the developer with the development charges collected by the Town for park development following the timeframes, re-payment structure, and terms of the Town’s parkland development agreement.

The following provides a general summary of the roles and responsibilities for parkland development under Option 2.

DEVELOPER'S RESPONSIBILITIES

- Planning Documentation
- Draft Plan of Subdivision (Program Development, Facility Fit Plan, Draft Plan Conditions)
- Subdivision Agreement
- Park Design Development (Concept Design and Functional Plan of Facilities)
- Detailed Park Design (Construction Drawings and Specifications)
- Tendering
- Parkland Development & Financing Agreement
- Park Construction and Assumption

Detailed expectations for each of the above responsibilities will be determined in the early stages of the Town's planning and development review process, based on project specific requirements, objectives, and budgets. At this time, appropriate legal agreements and financial reimbursement, reporting, and accountability/ transparency mechanisms shall be agreed upon prior advancing the Developer Design-Build option (Option 2).

2.6 OPTION 3: NO PARK BLOCK

In some instances, the provision of parkland within a development is not desirable and the Town may choose cash-in-lieu of the required parkland dedication. This situation could result from a variety of factors, such as:

- Sufficient parkland is already available nearby to accommodate residents' needs;
- Town identifies a more appropriate or accessible location for parkland;
- Usable/functional land is not available on the development site for parkland purposes (not large enough, not of sufficient quality, not tableland, etc.);
- Taking parkland from a development site may render the development not economically feasible, as a result of the reduction in dwelling units (smaller developments).

As a result, the Town may find it preferable to use the cash-in-lieu to expand or enhance existing parks directly serving the area.



PART 3 PARK DESIGN REQUIREMENTS

3.1 GENERAL

The following section identifies the key design standards, regulations, guidelines, and best practices that affect parkland development and sets minimum performance-based requirements for various park development works, recreational amenities, and supporting features.

This section is not intended to be comprehensive to all possibilities but defines criteria for elements that are common to most Wasaga Beach parkland, particularly at Neighborhood Park and Parkette levels.

Community Parks and Urban Plazas tend to be more complex and include public facilities (e.g., arenas, sports complexes, community centres, etc.), outdoor sports fields and courts for different competitive levels, as well as waterplays, skateboard parks, BMX courses, outdoor skating rinks, and other specialized public amenities. Such features will be reviewed on a project-by-project basis and design parameters supporting each facility will be guided through stakeholder consultation and preferences, contemporary best practices, and design guidance provided by specialists with specific expertise in the relevant works.

3.2 PARKLAND DESIGN STANDARDS

- Park development works, servicing and grading shall be designed and constructed in accordance with the requirements of the Wasaga Beach Engineering Standards (WBES), where applicable;
- All building and structures within parkland shall be designed and constructed in accordance with the Ontario Building Code (OBC);
- Design and implementation of all aspects of public parks shall be in full compliance with the

Accessibility for Ontarian with Disabilities Act (AODA) - Design of Public Spaces Standard;

- Design and implementation of children’s playspaces, playgrounds, and water play areas shall be in full compliance with the Canadian Standards Association’s (CSA) CAN/CSA-Z614-20: Children’s Playground Equipment and Surfacing (or latest edition);
- Further to the above, children’s playspaces shall comply specifically with Annex H of CAN/CSA-Z614-20) ‘Children’s Playgrounds and Equipment that are Accessible to Persons with Disabilities’;
- Park design shall consider ISO 22341:2021 ‘Security and Resilience - Protective Security - Guidelines for Crime Prevention Through Environmental Design (CPTED).

3.3 PEDESTRIAN CIRCULATION & DESTINATIONS

Pedestrian routes within parks not only serve to provide walking and bicycle access, but also establish an overall spatial structure that unifies and connects various principal and secondary spaces. Beyond their functional role, they are also recreational amenities in of themselves, serving as stable running, walking, and biking surfaces for physical exercise.

The choice of surface materials, widths and grades for pedestrian routes must be well-considered in context of their anticipated use, recognizing that they are essential to providing necessary access to amenities and spaces for users of varying ages and abilities.

The following are some key considerations when planning parkland pedestrian systems:

1. Pedestrian routes should be designed as barrier-free ‘Exterior Paths of Travel’ in accordance with AODA, particularly walkways that connect surrounding neighbourhood

sidewalks or parking lots to park amenities, spaces, or features.

2. It is acknowledged that not all walkways and trails within a larger park setting can be designed for accessibility as a result of grade constraints and sensitive environmental conditions, particularly in natural areas. These routes should be designed as 'Recreational Trails and Beach Access Routes' in accordance with AODA and signed appropriately.
3. All park areas accessible to the public should be designed in consideration of creating safe and comfortable environments for all users. Designs should consider visibility and surveillance and be approached to eliminate or reduce factors that tend to lead to crime, or the fear of crime, within a built environment, in accordance with CPTED principles.
4. Pedestrian routes should directly connect with opens space trails and municipal sidewalk systems surrounding or adjacent to the park.
5. Pedestrian gateways should be established at trail and sidewalk routes entering the park and at parking areas. Gateways should clearly demarcate pedestrian routes and should be enhanced with plantings, signage, and/or wayfinding features.
6. Walkways and trails should connect key amenities, spaces and features within the park and provide barrier-free access.
7. Walkways and trails should be laid out to provide spatial structure to open spaces by bordering edges. They can also be utilized to provide spatial separation between areas intended for different users or age groups (e.g., playspaces, etc.)
8. For exercise and recreational purposes, walkways and trails in large parks (circumference greater than 400m) should provide a walking/running/biking loop around the park's perimeter. Where practical, smaller loops should also be integrated at mid-points to offer a diversity of experiences and to accommodate users of various physical abilities. If constraints exist, portions of these looped systems may be substituted for sidewalks along street frontages, if required to complete the circuit.
9. Walkways and trails should be sized in consideration of anticipated user type (pedestrian, bicycle, in-line skating, etc.), frequency and volume of users, and environmental context. In general, all pedestrian routes shall have the following minimum spatial standards:
 - a) Accessible pedestrian routes: 1.5m wide
 - b) Multi-use Recreational Trails: 3.0m wide (<500 user/day) and 4.0 to 4.5m (>500 user/day)
 - c) Vertical clearance height: 3.0m
 - d) Mow strip (either side of all trails): 1.0m
10. The Town may decide that a park route is critical to year-round pedestrian connectivity and may decide to maintain such routes during winter months. All routes subject to winter maintenance shall be 3.0m wide minimum and be either asphalt or concrete surfaced.
11. Walkway and trail surfaces shall generally be concrete, asphalt, or compacted limestone screenings to ensure that a firm accessible surface is available throughout. The application of surface materials will be evaluated on a case-by-case basis, but will generally consider the following:
 - a) Concrete is recommended to highlight featured amenities/spaces (playground, central seating area, etc.), for areas of high-use and wear, and/or for urban parkettes.
 - b) Asphalt may be considered for high-use running/walking or biking trails, as they provide more energy-absorption for exercise (less joint impact) and tend to wear better than granular trails. Asphalt trails may also be utilized around playgrounds and other amenity areas in neighbourhood parks, where budgets are limited.

- c) Limestone screening surfaces are recommended for recreational trails within larger parks or in natural areas where accessibility is important, but the natural context is not conducive to concrete or asphalt.
- 12. Incorporate curb ramps and tactile walking surface indicators on a concrete base within the walkway surface at transitions between pedestrian and vehicular areas in accordance with AODA and/or the Ontario Building Code (OBC), if applicable.
- 13. Pre-cast concrete unit pavers are generally discouraged but may be considered by the Town as a decorative surface to highlight feature areas or in urban parkette settings.
- 14. Timber boardwalks, woodchip trails, or natural footpaths may be required to respond to certain environmental conditions and will be evaluated on a case-by-case basis.
- 15. Seating and other public amenities (e.g., waste receptacles, etc.) shall provide users with a choice between social and quiet/contemplative seating areas throughout the park.
- 16. For public eating areas, provision should be made for accessible tables/picnic tables (on hard surfacing) with sufficient space for manoeuvring.
- 17. Bike racks should be provided at each play space, activity hub, or destination facility. The quantity is to be determined by the Town on case-by-case basis (5 bike spaces minimum).
- 18. For children’s spaces, bike racks should be self-supporting wheel-in racks, as opposed to bike rings.

3.4 PARKING

On-site parking is typically provided for community parks, but on occasion, can be required for neighbourhood parks, depending on local conditions and amenities provided. Typically, neighbourhood

parks are serviced by on-street parking from adjacent municipal road corridors.

Parking accommodations will be determined based on available park facilities and amenities. Drop-off areas, bus parking, and other such accommodations, may also be required on a park specific basis.

As a general guideline, the following parking allocations are provided for various common park uses (Source: Time-Saver Standards for Landscape Architecture (2nd Edition), Charles W. Harris & Nicholas T. Dines, McGraw-Hill Publishing Company 1998):

Park Use	Parking Allocations
General Passive Use	15 spaces
Badminton	2 spaces/court
Baseball	15+ spaces/diamond for players plus an additional 20 spaces/diamond to accommodate spectators (35+ spaces total/diamond)
Lawn Bowling	2 spaces/green lane
Croquet	2 spaces/court
Football, touch	10 spaces/field
Shuffleboard	2 spaces/court
Softball	15 spaces/diamond
Tennis (singles)	2 spaces/court
Tennis (doubles)	4 spaces/court
Volleyball	6 spaces/court

Accessible parking quantities, type, layout, and signage shall be provided to comply with AODA - Design of Public Spaces Standards.

3.5 CHILDREN'S PLAYSPACES

Designs prepared for playgrounds, playspaces, and waterplay areas should demonstrate a comprehensive understanding of how children play, as well as consider the physical needs of both children and caregivers. This will involve the development of engaging spaces and environments further to the selection of play equipment and furnishings.

In this regard, careful consideration should be given to the nature of children's play, which generally ranges between the following Types of Play:

ACTIVE PLAY

Moving, running, jumping, climbing, sliding, twirling, swinging, spinning, rolling around

ARTISTIC PLAY

Drawing, crafting, painting, colouring, writing, singing, drumming, dancing

CREATIVE PLAY

Dress-up, pretend play, props, manipulating, building, molding, sifting, pouring, scooping, stacking, combining, altering

GAMES PLAY

Organizing, communicating, collaborating, and following rules

SENSORY PLAY

Touching different textures, smelling, hearing music and sounds, tasting edible plants and fruits, seeing different perspectives and angles, as well as shapes and colours

SOCIAL PLAY

Talking, sharing, cooperating, taking turns

REFLECTIVE PLAY

Watching, resting, reflecting, thinking, daydreaming

As the above types of play are generally consistent across all children (regardless of age or physical/cognitive ability), this approach enables a more inclusive approach to 'accessibility'. It focuses on the creation of shared play experiences/features,

as opposed to accommodating differences and disabilities.

Specific minimum requirements are as follows:

1. Playspaces should be located within public parks to be:
 - a) clearly visible from adjacent streets, neighbouring uses, and neighbouring residents to provide passive surveillance.
 - b) along secondary pedestrian pathways, to ensure that primary pedestrian routes do not separate adult supervision areas from playspaces.
2. At a minimum, each playground should incorporate separated play spaces that offer a range and diversity of play types for the following groups:
 - 1 Tot Area: 0 - 5 years
 - 1 Youth Area: 5 - 12 years
 - 1 Swing Area: Adult swings, toddler swings, accessible swings, basket swings, etc.
3. Tot and Youth play structures/areas may be combined for smaller playgrounds, as approved by the Town.
4. Inclusive and/or accessible play features shall be integrated into the playground design and where practical, play equipment should include features that can be used by children with attending adults (e.g., double width slides, etc.)
5. Surface treatments that promote accessibility and inclusiveness for playground users and caregivers should be prioritized.
6. To minimize costs, playground safety surfacing should not be significantly oversized relative to the required fall protection zones for playground structures, unless design merits and approved by the Town.
7. Playgrounds with loose-filled safety surfacing shall be graded generally flat and be contained with a curb to reduce migration and mixing of safety surface material. The top of curb and adjacent finished grade should be 100mm to

150mm higher than the playground safety surface for containment.

8. All playgrounds shall provide a minimum of 1 accessible ramp to allow access into the play space. The ramps should extend to the bottom of the playground pit to ensure that access is maintained should loose safety surface material becomes displaced or migrate.
9. To prevent flooding of playgrounds, safety surfacing may require a drainage under-layer and be sub-drained to an appropriate surface outlet or storm sewer connection, where soils are conducive to compaction and water retention. Requirements for a sub-drainage system will be determined by the Town in consultation with the playground design consultant.
10. Where sub-drainage is required, the playground subgrade shall be sloped at a minimum of 1% and crowned to ensure that sub-surface drainage can access the sub-drain system. Sub-grades are to be maintained/repared throughout construction, particularly following the sub-drain and footing installations.
11. Install wear mats under swings and slide exits, 100mm below the top of the safety surface and anchored in place as per manufacturer's specifications.
12. Playgrounds shall include safety signage indicating the appropriate age range for the use of the equipment and contact information for the Town regarding maintenance and security.
13. Further to playground structures/equipment, children's playspaces should also include the following:
 - a) Consideration of all-season play, highlighting seasonal changes and providing for winter activities.
 - b) Seating areas for adults and caregivers with appropriate amenities, furnishings, and environmental considerations

(shade, wind-protection, etc.) to support supervisory and social activities.

- c) Social areas, seating and activities for teenagers and youth to provide for social interaction, showing-off, people watching, etc.
- d) Pedestrian-oriented or 'morality' lighting in unlit areas for added surveillance opportunities and to extend evening usage hours. At least one (1) light standard must be provided at playgrounds for security.
- e) Small lawn spaces near adult supervision areas for toddlers and larger lawn areas for games and active recreational use by youth.
- f) Landscaping, plantings, or structures for shade and to reduce sun and temperature exposure.
- g) Natural features, materials, and planting incorporated to add to play opportunities.



14. 'Natural Playgrounds' may also be permitted should they be deemed appropriate by the Town based on design merit and acceptance of maintenance commitments. Further to the above playground requirements, natural playgrounds should also consider the following:

- a) Design of natural play spaces shall predominantly use natural materials, landscape features, landforms, and plantings to achieve the intended uses while adhering to the requirements of CAN/CSA-Z614-20 (or latest edition).
- b) Further to achieving a diversity of play types, the play experience should be focused on interaction with natural materials and the environment and opportunities to play with loose materials (manipulative/discovery play).
- c) Activities should be spread around the entire area, allowing for diversified play, running between activities, and reduced exclusionary play (avoid single centralized piece).

- d) Play equipment provided within natural playgrounds (slides, climbers, etc.) should be integrated with landforms to manage access and grade transitions (e.g., hill-slides, web climbers secured to rock features, etc.)
- e) Topographic changes in the landform of a natural playground are beneficial (e.g., berms, stone walls, natural amphitheatres, etc.)
- f) Incorporation of nature learning is beneficial (sundials, rain gauges, nature trails, etc.)
- g) Interpretive signage should be incorporated highlighting the local environment and natural systems, as well as the natural features within the play space (butterfly garden, use of natural material, etc.)
- h) Variations in pathway materials can add to ground-level tactile experiences.



3.6 FACILITY SIZES & BUFFERS

When park planning, it is important to consider the relationship of facilities/amenities to each other and to surrounding properties/uses. This is particularly relevant for outdoor sports fields and courts that are lit and/or have the potential for ball spray hazards (e.g., baseball, softball, golf, etc.), or require runouts (e.g., soccer, football, rugby, etc.)

The following provides a list of typical facility sizes and setback buffers to consider when demonstrating 'Facility Fit' for parks. Actual facility footprints, layout, and buffers will be determined through consultation with stakeholders (local sports organizations/users) and design specialists and shall be agreed upon by the Town prior to preparation of the Facility Fit Plan.

FACILITY	SIZE (APPROX.)	BUFFER TO OTHER FACILITIES
Artificial Turf Field	64m x 110m	15m on all sides
Senior Soccer Field	60m x 100m	10m on sides/12m on ends
Junior Soccer Field	36.6m x 55m	5m on sides/10m on ends
Football Field	65yds x 110yds	10m on sides/5m on ends
Senior Hardball Diamond	122m x 122m	15m on all sides
Senior Softball Diamond	80m x 80m	12m on all sides
Intermediate Softball Diamond	70m x 70m	9m on all sides
Multi-use Court	29.6m x 17.24m	N/A (possibly fenced)
Basketball Court	29.6m x 17.24m	N/A
Basketball Half-Court	14.8m x 8.62m	N/A
Tennis Court	18m x 36m	N/A (fenced)
Bocce Courts (set of 2)	13m x 37m	N/A (fenced)
Lawn Bowling Green	40m x 40m	N/A (fenced)
Playground (Neighbourhood)	500m ²	N/A
Playground (Community)	1,000m ²	N/A
Waterplay/Splash pad (Neighbourhood)	500m ²	N/A
Waterplay/Splash pad (Community)	1,000m ²	N/A
Skateboard Park (Community)	930m ² to 1115m ²	N/A
Skateboard Park (Neighbourhood)	185m ²	N/A
Bike Park	1.50 ha	N/A
Off-leash Dog Park	100m x 100m	15m+ buffer
Outdoor Ice Rink	0.08ha	N/A
Community Garden Plot	0.05 ha	N/A
Fieldhouse (storage/change/washrooms)	12m x 7.4m	N/A
Tennis Clubhouse	55m ²	N/A
Washroom Building (standalone)	45m ²	N/A
Storage Building (stand-alone)	55m ²	N/A

Where sports facilities are located adjacent to private properties or road corridors, an additional 10m buffer (minimum) shall be applied to the above buffers. Buffer requirements will be assessed on a project specific basis and will be confirmed or increased based on perceived conflicts, hazards, or sensitivity of neighbouring uses.

3.7 OUTDOOR SPORTS FIELDS & DIAMONDS

Natural turf outdoor sports fields support local recreational and competitive league sport organizations, such as soccer, baseball, softball, rugby, football, and ultimate frisbee. These activities are important to the health and development of the community's youth and the physical and social well-being of adults.

Depending on the level and competitiveness of play, outdoor sports fields range greatly in requirements for design, construction, supporting servicing and amenities, and associated capital and operational costs.

The 'Athletic Field Construction Manual' (latest edition) prepared by the Sports Turf Association sets the accepted standard for the categorization, specification, field evaluation, and layout/dimensioning of natural turf sports fields in Ontario. This manual establishes 5 categories of field construction ranging from national/international competitive use (Category 1) to fields intended for regular casual use by neighbourhood residents (Category 5).

Further to retaining a sports field specialist to guide the design and development of outdoor sports fields, all field sizing and layout, specifications, and details should be based on one of the five field categories, as determined by the Town and specified in accordance with the 'Athletic Field Construction Manual'.

Further to the above, specific minimum requirements are as follows:

NATURAL TURF FIELDS

1. For higher quality sports fields, the contractor may be responsible to retain a certified sports field soils specialist/agronomist to test and evaluate the native topsoil, make recommendations for blending/amendment to meet the desired specifications (Category 1 to 5), and to confirm compliance prior to laying the rootzone material.
2. If rootzone mixes are blended/amended on-site utilizing stockpiled native topsoil, then screening and blending must be completed with purpose-intended equipment designed for such applications, to create a consistent and even rootzone blend. Blending with 'buckets' from excavators or other such equipment will not be accepted.
3. If rootzone mixes are imported and blended off-site, the supplier's testing reports are required to confirm compliance with the relevant rootzone specifications outlined in the Athletic Field Construction Manual.
4. All rough and finish grading for sports fields shall be completed with a track type blade using an automatic laser-controlled dual slope or GPS guided system, operated by an experienced operator.
5. Sub-drain trenching for sports fields shall be completed using automatic laser-controlled or GPS guided equipment capable of maintaining a maximum variance of +/- 25mm in the grade line and operated by an experienced operator. Trenching machinery shall be capable conveying excavated materials for removal from site without spillage onto adjacent turf areas.
6. All other machinery used for sports field construction will be equipped with low compaction flotation tires and no equipment will be permitted on fields when saturated.
7. Sub-drains shall be wrapped in a knitted geotextile sock only where surrounding soil material contains greater than 50% silt plus very fine sand, as determined by laboratory



analysis or as recommended by the soil agronomist.

8. Sod for sports fields shall be 1 Number One Kentucky Bluegrass Sod: grown from a minimum mixture of three (3) Kentucky Bluegrass cultivars recommended for sports turf areas. Sod cultivar content shall be approved by the Town prior to placement.
9. For sod intended for rootzone mixtures with a sandy loam/loamy sand composition, sod shall be grown in a soil with a sandy loam texture on the U.S.D.A. Soil Textural Triangle.

BASEBALL INFIELD

1. Infield mixes shall be purpose-intended granular products mixed specifically for baseball and softball uses. Examples include 'Standard Ball Park Mix' by Hutchinson Sand Mixes (lower-end) or a clay-based infield by Marco Clay (higher-end).
2. Stone dust or limestone screenings shall not be used for infields unless otherwise approved by the Town.

3.8 SPORTS FENCING & AMENITIES

1. Baseball and softball backstop, foul line, and outfield fencing, as well as all sport court fencing (tennis, pickle ball, multi-court, etc.) shall be in accordance with relevant Ontario Provincial Standard (OPS) specifications for chain-link fencing and designed appropriately for the given facility.
2. Backstop fencing and batter's cages shall be welded structures and should be designed and stamped by a structural engineer licenced in the province of Ontario. Contractors should also submit shop drawings for backstop fencing and batter's cage fabrications for approval by the design engineer and Town.
3. Mesh for baseball, softball, and sport courts shall be placed on the inside of the facility, towards the play environment.
4. Backstop fencing and batter's cages shall have 38mm mesh fabric to prevent climbing and be

made from 6-gauge fabric to minimize the potential of high-impact deformation.

5. Sport court fencing, which tends to taller, should also use 38mm mesh fabric to prevent climbing but can be made from standard 9-gauge fabric.
6. All gates for sports facilities shall be welded and furnished with galvanized malleable iron hinges, latch and latch catch, with provision for a padlock. Access gates shall open outward away from the play environment, shall be self-closing, and shall have a self-latching device.
7. Sports furnishing, goal posts, and nets shall be selected to best suit the intended facility type, volume of use, and project budget with input and approval from Town staff. Furnishings may include player benches, bleachers, soccer goals/nets, football goosenecks, tennis net/posts, etc.

3.9 PLANTING & LANDSCAPE

Trees, shrubs, and groundcovers shall be planted in parkland to rehabilitate lost or disturbed forested areas, buffer or support existing natural landscapes, enhance community aesthetics, and to provide improved micro-climactic conditions for park users (e.g., shade, windbreaks, controlled snow drifting, etc.)

Specific minimum requirements are as follows:

1. Selected tree species should be urban tolerant, hardy, low maintenance, reasonably resistant to disease and pests, and suitable in size, form, and structure for their given environment.
2. The plant hardiness zone in the Town of Wasaga Beach is 6a. Native soils in Wasaga Beach are also typically sandy and species selected should consider these soil conditions.
3. A mixture of coniferous and deciduous trees should be planted with sufficient species diversity to minimize the potential for species specific mortality from pests, disease, or changing climatic conditions. To ensure diversity, the plant palette should include no

more than 20% of one tree genus and 10% of one tree species.

4. Emphasis should be given to native species to replace, support, and enhance local forest systems. Non-native non-invasive species will be acceptable in areas where urban conditions, salt-use, and other maintenance practices may create unfavourable conditions for the survivability of native species (e.g., adjacent to parking lots, etc.)
5. Horticultural shrub and perennial plantings requiring a medium to high level of maintenance are generally discouraged, as they do not add value in restoring the park's natural plant communities and require additional resources and budget to maintain. However, such decorative feature plantings would be deemed appropriate at park entrances, gateways, or public congregation areas and will be considered by the Town based on design merit.
6. All plantings in a park shall be located and sized in consideration of public safety, visibility, and surveillance, and should demonstrate consideration of CPTED principles.

PART 4 TECHNICAL DESIGN STANDARDS

The following section is intended to define minimum technical standards for parkland development. These standards establish a baseline of quality and expectations for the design, specification, detailing, and construction of park amenities and features.

As such, applicants and consultants involved in park development projects, whether advanced by the Town or the developer, shall ensure that they are familiar with the most current version of the technical standards and that all design submissions meet or exceed requirements.

Higher standards will be permitted at the request of the applicant on a case-by-case basis, following review and approval by the Town.

Technical standards in this Section shall be in designed, specified, and constructed in accordance with the applicable Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Details (OPSD) – latest edition, unless otherwise noted.

4.1 TEMPORARY CONSTRUCTION FENCING

All parkland that is accessible to the public shall be protected and enclosed during construction utilizing temporary construction fencing. The project site, materials, and equipment shall be secured from public access and temporary fencing shall be maintained as an effective barrier throughout construction.

All playspaces and playground equipment installed prior to completion (or formal playspace certification) shall be secured with construction fencing in accordance with Section 8.3 of CAN/CSA-Z614-20 (or latest edition). Construction fencing shall be removed only after playgrounds are certified as compliant with CAN/CSA-Z614-20 by a third-party CSA reviewer and a Substantial Performance Certificate has been issued, unless otherwise directed by the Town.

Specific minimum requirements are as follows:

1. Construction fencing shall be a minimum of 1.2m high orange plastic fencing, secured with wire ties to heavy gauge T-bars spaced every 2.4m O.C.
2. 1.8m high modular metal construction fencing is recommended to enclose unopened and uncertified playgrounds, or other areas of high public risk, as required by the Town.
3. Construction fencing shall be erected prior to commencing any work and removed upon completion of the works, following approval by the Town.

4.2 SEDIMENT & EROSION CONTROL

Prior to clearing, grubbing, stripping or removal operations, erosion and sediment control measures shall be installed to control erosion and to protect waterways. Typical methods utilized are heavy duty-silt fence barriers, straw bale flow check dams, mud mats, erosion control blankets, etc. The location and type of measures utilized is site specific and shall be determined by the professional responsible for the park design (engineer, landscape architect, etc.)

Where required, siltation control measures shall be erected prior to commencing any work and shall not be removed until after restoration, groundcover, and landscaping are established, and following approval by the Town.

Specific minimum requirements are as follows:

1. Silt/sediment fence shall be in accordance with the Town of Wasaga Beach Engineering Standards. Light duty silt fence will not be accepted.
2. Mud and debris tracked onto any road, parking area, walkway, trail, or other surface, both on and off the site, shall be immediately cleaned up to the satisfaction of the Town.

4.3 TREE PRESERVATION & REMOVALS

All efforts should be made to preserve existing healthy trees and vegetation communities within park development blocks. No parkland trees shall be removed without the written permission of the Town.

Specific minimum requirements are as follows:

1. An Arborist Report and Tree Inventory/Preservation Plan may be required by the Town as a component of the pre-design studies to ensure that design work for the park is completed in consideration of tree preservation objectives and required construction restrictions.
2. Tree Inventory/Preservation Plans shall be prepared in accordance with the Town's Engineering Standards.
3. All arborist reports and inventories shall be prepared by a certified ISA Arborist.

4.4 TOPSOIL STRIPPING, SCREENING, & STOCKPILING

Prior to grading operations, native topsoil/organic material shall be stripped from all disturbed areas to full depth and screened and stockpiled where suitable for re-use.

Specific minimum requirements are as follows:

1. Strip topsoil when dry enough and in a manner to prevent contamination with subsoil material. Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
2. Native topsoil intended for re-use shall be stockpiled and tested in accordance with the Town's Engineering Standards to ensure that the fertility and composition are suitable for use in a public park. Test results shall be submitted to the Town for approval prior to the park development.
3. Native topsoil shall be amended to conform with the Engineering Standard's specifications for 'Topsoil', based on testing laboratory recommendations.
4. Topsoil for general parkland applications shall be screened through a 25mm (1") size screen and be reasonably free from debris, sub-soil, clay lumps, roots and stones over 25mm diameter, and coarse vegetative material occupying more than 2% of soil volume.
5. Where applicable, stockpile sufficient quantities of screened/amended topsoil to ensure enough is available to complete the specified topsoil and finished grading works to the required compacted depths. Once screened topsoil material has been approved for use, the stockpile must not be changed without further approval by the Town.
6. Dispose of surplus or unsuitable stripped topsoil and all topsoil waste/by product off-site in accordance with provincial regulations.

4.5 EARTHWORKS & ROUGH GRADING

All earthworks and rough grading for general park areas shall be in accordance with the Town's Engineering Standards and the recommendations of the geotechnical engineer, where applicable.

Specific minimum requirements are as follows:

1. Cut and fill native sub-grade and supply, haul, place, shape, and compact imported fill material as required to achieve compacted sub-grade elevations.
2. Provide suitable imported structural fill below all hard-surface areas, including pathways, paved recreation facilities, and parking areas within the park.
3. Imported fill material requires geotechnical confirmation/certification regarding the source of the material and the suitability of its intended use. If the material source is from any site other than a licensed source pit/quarry, then the geotechnical certification must also indicate that the material has been tested for contamination and has been confirmed to be "clean fill" suitable for publicly accessible sites.

All soils to meet O.Reg 406/19. Additional supporting and informative references in terms of imported fill can be reviewed at the following website: <https://www.ontario.ca/page/rules-soil-management-and-excess-soil-quality-standards>.

4. If imported fill is supplied from a licensed pit/quarry, it shall be Select Subgrade Material (SSM) as per Ontario Provincial Standards (OPS). Provide source and sample of imported SSM fill and obtain approval from the Town prior to delivery.
5. Limestone screenings shall not be accepted as imported fill in parkland, as it changes soil pH and alters availability of nutrients, which can negatively affect existing and new plant material.
6. Fill shall be placed in layers not exceeding 300 mm thick and shall be thoroughly compacted to 95% Standard Proctor Maximum Dry Density (SPMDD) minimum, and/or as approved by the geotechnical engineer. Engineered fill shall be placed and compacted under direct supervision and testing by a geotechnical engineer. Test results shall be submitted to the Town for record.
7. Slope rough grade away from existing features and grade slopes and berms to a maximum of 4:1 for ease of maintenance.
8. Areas intended for turf-grass (except purpose-designed athletic fields) shall have a minimum surface grade of 2.0% for drainage purposes.
9. Swales shall be graded at 2.0% along their length whenever possible, however, a minimum gradient of 1.0% will be accepted over short distances in native sandy soils where constraints exist or to avoid overly steep side slopes for swales.
10. Although not preferred, swales with gradients less than 1.0% will be considered in unavoidable circumstances, provided that a 150mm diameter pipe sub-drain is provided, as follows:
 - a) Sub-drains shall be perforated, corrugated plastic pipe with geotextile placed at 0.5 m offset from property line at a minimum.
 - b) Sub-drains shall be bedded in a 300 mm x 300 mm clear stone trench below the swale and shall conform to applicable OPS specifications.
 - c) In such cases, the subdrain is to connect to a positive outlet (e.g., CB, etc.)

11. Tolerances: all earth grade surfaces shall on completion be shaped to the grades and cross sections specified within the following vertical tolerances of established grade over a 3m straightedge (not uniformly high or low):
 - a) General landscape areas, embankments, ditches, and swales: +/-25mm
 - b) Concrete, asphalt, and granular sub-surfaces: +/- 10mm
 - c) Playground subsurface: +/- 10mm
 - d) Sports Fields and play courts +/- 10mm
12. Finished rough-grade surfaces to be free of debris or stones larger than 25mm diameter.
13. Dispose of surplus/unsuitable fill or deleterious material off-site in accordance with provincial regulations.
14. For standards and guidelines related to grading of outdoor sports fields, refer to Section 3.

4.6 ARMOURSTONE RETAINING & SEAT WALLS

Armourstone retaining walls are common in park settings to retain low grade transitions (0.5m - 1.5m on average) and offer a natural aesthetic. Armourstone is also considered a locally sourced and readily available natural material.

For this reason, armourstone is also often used as informal seating or edging in many park environments, either in free-standing single units or in rows. As armourstone has an uneven surface and does not offer back support, it should only be used for secondary seating in support of nearby primary seating, such as benches and picnic tables.

Armourstone retaining walls 1.0m high or greater shall be designed, stamped, and certified by a structural engineer licensed in the Province of Ontario.

Specific minimum requirements are as follows:

1. Armourstone retaining/seat walls shall be firmly set on a granular base so that units exhibit no tendency to rock or slide when lateral force is applied and shall be buried 100mm - 150mm below grade.
2. Non-woven geotextile shall provide a barrier between the stone and the backfill to prevent erosion of soil/granular backfill material through the stone seams.
3. Armourstone seat walls shall ideally be set approximately 400mm - 500mm high to provide a comfortable seating height for both adults and children.
4. Retaining walls shall be stepped appropriately to match grading requirements.
5. Armourstone blocks shall be:
 - a) square cut quarried limestone, split face, with uniform dark grey colour, exhibiting split faces or naturally weathered faces, with reasonable flat bottom, top and sides;
 - b) show no excessive drill or machine marks and shall be placed with best face outside, so the wall presents an integrated uniform appearance;
 - c) appropriately sized to suit project requirements.
6. Where seams are required to be tight (e.g., playspaces, outdoor classrooms, etc.) stones shall be cut to create tight seams. In these locations, crevices and openings between stones shall not exceed 25mm.
7. Granular base shall be 150mm Granular 'A' compacted to 98% SPMDD, unless otherwise recommended by a geo-technical engineer.

8. Geo-textile shall be Terrafix 270R or approved equal.
9. Where upland surface drainage or groundwater conditions warrant, sub-drainage may need to be incorporated behind the wall to alleviate groundwater build-up.

4.7 GRANULAR WALKWAYS & TRAILS

Typically, parkland trails and walkways will be 3.0m wide granular surface trails, constructed and signed in accordance with the Town's Engineering Standards. Alternative widths may be considered when spatial conditions are constrained or when supported by site specific project objectives, at the sole discretion of the Town.

Specific minimum requirements are as follows:

1. Granular walkways and trails shall be limestone screenings over a Granular 'A' base, placed on a non-woven geotextile layer as per the Town's Engineering Standards, unless otherwise recommended by a geo-technical engineer.
2. Provide curb ramps and tactile walking surface indicators on a concrete base within the granular surface, at transitions between pedestrian and vehicular areas, in accordance with AODA and/or the Ontario Building Code (OBC), if applicable.
3. Maximum grade for granular walkways and trails is 8% to reduce the potential of surface erosion.

4.8 CONCRETE WALKWAYS & TRAILS

Concrete surfaces are suitable for urban parks where concrete materials match the context and aesthetic of the space (e.g., urban plazas, parkettes, etc.) Furthermore, concrete surfacing should be utilized for high traffic areas in all parks, such as playgrounds, washrooms, and other amenities.

In consideration of those using assistive mobility devices (e.g., wheelchairs, walkers, etc.) or those pushing strollers, concrete jointing should be sawcut and all required tooling should be troweled flat to provide a smooth user experience. However, the edge of concrete walkways and slabs should have tooled edges to provide tactile relief detectable by canes or other similar assistive devices.

Specific minimum requirements are as follows:

1. Concrete walkways and trails shall be 150mm cast-in-place (CIP) concrete on a 150mm Granular 'A' base, unless otherwise recommended by a geo-technical engineer.
2. Concrete surfaces shall meet the following criteria:
 - a) 32 MPa compressive strength, C-2 exposure at 28 days with 7% +/- 1.5% air entrainment, measured at point of placement in accordance with CAN/CSA-A23.1.
 - b) Finish: light broom finish, perpendicular to the general direction of pedestrian travel.
 - c) Expansion Joints: full depth expansion board with joint edges tooled and then trowelled flat for a smooth accessible surface. Raised tooled joint edges will not be accepted. Expansion joints shall be placed to suit design parameters and where concrete abuts adjacent concrete surfaces, curbs, and building foundations.
 - d) Control Joints: saw cut to 1/4 depth of slab and spaced to suit design parameters (between 1.5m and 3.0m O.C. based on slab proportions and to achieve relatively square panels). Saw cut joints shall be by wet diamond blade, commencing 8 to 24 hours after concrete placement, as soon as the concrete surface has hardened sufficiently to resist dislodging aggregate while cutting.

- e) Slab Edges: outside edges of concrete walkway shall be tooled.
- 3. Where subsurface soils are poor or questionable, or where conditions merit, welded wire mesh (WWM) shall be incorporated into the slab design. Size of mesh and slab placement depth shall be determined by the design consultant based on specific design objectives and conditions.
- 4. Granular base shall be Granular 'A' compacted to 98% SPMDD, unless otherwise recommended by a geo-technical engineer.
- 5. Provide curb ramps and tactile walking surface indicators (TWSI) at transitions between pedestrian and vehicular areas in accordance with AODA and/or the Ontario Building Code (OBC), if applicable.
- 6. Tolerances: all work shall be subject to the following vertical tolerances of established grade over a 3m straightedge (not uniformly high or low):
 - a) Granular base: $\pm 10\text{mm}$
 - b) Concrete surface (after texturing): $\pm 6\text{mm}$
 - c) Concrete thickness: $\pm 8\text{ mm}$

4.9 ASPHALT WALKWAYS & TRAILS

Asphalt surfaces may be considered for high use running/walking or biking trails, as they provide more energy-absorption for exercise (less joint impact). They may also be considered in other park applications where grades are too steep for granular surfaces (or where water crosses) or where hard surfacing is desired, but budgets are constrained.

Specific minimum requirements are as follows:

- 1. Asphalt walkways and trails shall be 50mm HL3 hot mix asphalt on 200mm Granular 'A' base, unless otherwise recommended by a geo-technical engineer.
- 2. Hot mix asphalt shall be continuously rolled to achieve a density not less than 97% Marshall Bulk Density.
- 3. Granular base shall be Granular 'A' compacted to 98% SPMDD, unless otherwise recommended by a geo-technical engineer.
- 4. Provide curb ramps and tactile walking surface indicators (TWSI) on a concrete base within the asphalt surface, at transitions between pedestrian and vehicular areas, in accordance with AODA and/or the Ontario Building Code (OBC), if applicable.
- 5. The finished surface shall be of uniform texture and shall be free of segregation, flat spots, oil spills or other defects.
- 6. Tolerances: all work shall be subject to the following vertical tolerances of established grade over a 3m straightedge (not uniformly high or low):
 - a) Granular base: $\pm 10\text{mm}$
 - b) Asphalt surface: $\pm 5\text{mm}$

4.10 CHAIN-LINK FENCING

Chain-link fencing shall be provided to separate privately owned lands from municipally owned lands/blocks as required in the Development Agreement. Such fencing shall be constructed wholly on municipal property.

Park frontages along streets and boundaries shared with schools, open spaces, or stormwater management facilities do not require fencing, unless required by the Town.

Specific minimum requirements are as follows:

1. Chain link fencing and gates shall be 1.5m black vinyl fencing with a top rail per OPSD 972.130 and shall include all required posts, concrete footings, bracing, rails, fence fabric, lockable gates, and all hardware, attachments, and accessories.
2. Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts and provide minimum clearance between bottom of fence and ground surface of 25mm.
3. Chain link fencing and gates shall meet the following requirements:
 - a) The mesh fabric shall have 50mm diamond-shaped openings made from 9-gauge wire before vinyl coating, unless otherwise indicated (e.g., sport facilities).
 - b) Terminal posts shall be a minimum of 89mm (3 ½") OD pipe, line posts 60mm (2 3/8") OD pipe and rails 43mm (1 7/8") OD pipe.
 - c) All piping shall be Schedule 40, galvanized steel.
 - d) Mesh fabric to be installed on inside face towards park.
4. Concrete footings shall be as per OPSD 972.130.
5. Where ground conditions prevent the creation of smooth sided augured post holes, footings shall be poured into sono-tubes to full depth. Voids around the outside of the form shall be filled with compacted limestone screenings.
6. Private access gates are not permitted through Municipally owned fences, other than as stipulated in the Town's Corporate Gate Policy.

4.11 PLAY STRUCTURES

Play equipment elements, structures, and layout shall be reviewed and approved by the Town, based on recommendations provided by the design landscape architect and supplier, conveyed through functional plans, detailed budget estimates, and/or a play equipment program document.

Specific minimum requirements are as follows:

1. Play structures shall conform to the requirements of CAN/CSA-Z614-20: Children's Playground Equipment and Surfacing (or latest edition) and the Accessibility for Ontarian with Disabilities Act (AODA) - Design of Public Spaces Standard.
2. All prefabricated play structures shall be installed by the manufacturer (or their trained sub-contractors) in accordance with the manufacturer's specifications and layout plans.
3. Playground equipment may be installed on concrete pier footings or steel stringer footings.
4. Submit the following to confirm regulation compliance and for Town record:

- a) CSA compliant layout plans for the play structures prepared by the manufacturer/supplier, including all required dimensions, fall protection zones, and no-encroachment zones.
- b) Engineered fabrication drawings for each playground product, outlining the materials, colours, options for approval by the Town prior to fabrication.
- c) Product information, specifications, installation instructions and a detailed part list as required by CAN/CSA-Z614-20 - Clause 8.1.
- d) Manufacturer's certification of structural integrity of the equipment in accordance with CAN/CSA-Z614-20 - Clause 9.1.
- e) Maintenance data for care and cleaning of the equipment.
- f) Following installation, the manufacturer/installers shall submit a signed 'Certificate of CSA Compliance' formally confirming that the design, fabrication, and installation of all play structures are in full compliance with CSA. Compliance must be provided by a third-party CSA inspector.

4.12 CONCRETE PLAYGROUND CURB

Playgrounds with loose-filled safety surfacing shall be contained with a curb to reduce migration and mixing of safety surface material.

Specific minimum requirements are as follows:

1. Concrete play space curbs shall meet the minimum dimensional requirements of OPSD 600.110 - Concrete Barrier Curb, and shall be:
 - a) 30MPa compressive strength, C-2 exposure at 28 days with 7% +/- 1.5% air entrainment, measured at point of placement in accordance with CAN/CSA-A23.1.
 - b) Finish: Light broom finish, perpendicular to the longitudinal curb alignment.
 - c) Control Joints: Saw cut to 1/4 depth of curb thickness and spaced maximum 2.0m O.C. Saw cut control joints shall be by wet diamond blade, commencing 8 to 24 hours after concrete placement, as soon as the concrete surface has hardened sufficiently to resist dislodging aggregate while cutting.
2. Granular base shall be 150mm Granular 'A' compacted to 98% SPMDD, unless otherwise recommended by a geo-technical engineer.
3. The curb shall be depressed to accommodate a minimum of 1 accessible ramp permitting accessible entry into the playspace in an appropriate location.
4. Tolerances: all work shall be subject to the following vertical tolerances of established grade over a 3m straightedge (not uniformly high or low):
 - a) Granular base: $\pm 10\text{mm}$
 - b) Concrete curb height (after texturing): $\pm 6\text{mm}$

4.13 SUBDRAINAGE

To prevent flooding of playgrounds, a sub-drainage system may be required under loose-filled playground safety surfacing, where soils are conducive to compaction and/or water retention, as determined by the Town. Sub-drains will drain positively to an appropriate surface outlet or storm sewer connection. Omission of the sub-drain system may be considered by the Town Engineer if supported by a report from a qualified soils consultant, in areas of native sandy material only.

Specific minimum requirements are as follows:

1. A perimeter sub-drain shall surround the playspace. The edge of the sub-drain trench shall be offset from the inside face of the playground curb by 200mm. Depending on soil conditions, linear lateral subdrains may also be required and spaced every 3.0m to 5.0m.
2. Sub-drain pipe shall conform to the following requirements:
 - a) 100mm to 150mm dia. perforated, corrugated, HDPE sub-drainage pipe (Big 'O') and fittings wrapped in a knitted sock geotextile.
 - b) 150mm to 200mm dia. non-perforated (solid) HDPE outlet drainage pipe (Big 'O') and fittings.
 - c) Appropriate fittings and rodent grates to attach to perforated polyethylene drainage pipe as per manufacturer's specifications.
 - d) Nominal pipe sizes as required by design.
 - e) Bedding, embedment and backfill material shall be 19mm diameter clear stone Type I or Type II.
 - f) Non-woven geotextile shall be Terrafix 270R or approved equal.
3. Pipes shall be appropriately sized to suit conditions.
4. Sub-drains shall be bedded in a 300mm deep (min.) x 400mm wide trench wrapped in geotextile with a 300mm fabric overlap.
5. Lay pipe on 50mm bedding material at a minimum slope of 0.5%, with maximum variation from true slope of 3mm over 3m, prior to embedment.
6. If outletting to storm sewer infrastructure, make watertight connections to existing drains or new/existing manholes and catch basins, in accordance with Town standards.
7. Provide rodent grates at sub-drain outlets where daylighting to surface ditches, swales, or ponds.
8. For standards and guidelines related to sub-drainage for outdoor sports fields, refer to Section 3.

4.14 PLAYGROUND SAFETY SURFACE

Playground safety surface shall be engineered wood fiber with a minimum 300mm settled depth, meeting the requirements of CAN/CSA-Z614-20 (or latest edition). Minimum depths should be increased to conform to the fall protection requirements of adjacent play equipment/ structures and to accommodate variations in sloped sub-grade conditions.

Playgrounds with loose-filled safety surfacing shall be graded generally flat and be contained with a curb to reduce migration and mixing of safety surface material. The top of curb and adjacent finished grade should be 100mm to 150mm higher than the playground safety surface for containment.

Specific minimum requirements are as follows:

1. Playground safety surface shall be proprietary engineered wood fiber chips, purpose-intended for use in playgrounds.
2. Loose-filled safety surfacing shall be placed over a continuous non-woven geotextile with 450mm fabric overlap.
3. Where drainage is a concern in poor soils, the Town may require that engineered wood chips be placed over a 75mm thick min. $\frac{3}{4}$ " clear stone drainage layer wrapped in a non-woven geotextile. A proprietary drainage system is also acceptable upon approval by the Town.
4. Geotextile shall be Terrafix 270R or approved equal.

In some cases, poured-in-place EPDM rubber safety surfacing may be required for Community Parks in consideration of enhanced accessibility objectives or where prevalence of drug-use may be of concern (better visibility of hazards such as needles, glass, etc.), based on design merit and where budget permits.

Where required by the Town, EPDM rubber shall be sub-drained and supplied and installed in accordance with manufacturer's specifications.

4.15 SHADE STRUCTURES

Shade is an important component of user comfort, as it provides protection from harmful UV exposure and results in micro-climatic cooling. Where mature trees are not available, it is sometimes necessary to erect structures to provide shade to support amenities. The establishment of these structures also has design benefit, as they provide a visual focus to key park areas through their architectural presence and the introduction of colour and form.

Examples of shade structures include prefabricated picnic pavilions, gazebos, trellises, shade sails, etc. These features are often incorporated into primary seating areas, as well as around children's play areas and adult supervision/social spaces.

Specific minimum requirements are as follows:

1. Prefabricated shade structures/sails and associated structural pier footings or concrete slabs shall be designed and installed, in accordance with the manufacturer's specifications and layout plans.
2. If utilizing concrete pier footings, a concrete paved surface shall be provided under the shade structure.
3. Designs shall include provisions to accommodate electrical conduit, wiring, power outlets, and light fixture attachments associated with the shade structure to meet the Town's project specific lighting and event needs.
4. If a slab footing is utilized, electrical conduit for the structure's power supply shall penetrate the concrete slab to be tight to the base of the nearest post for adequate concealment.
5. Submit the following to confirm design compliance and for Town record:
6. Engineered shop drawings for the shade structure and the structural concrete slab/pier footing, stamped by a structural engineer licenced in the province of Ontario.
7. Inspection and formal certification of the shade structure installation and structural concrete slab/pier footing installation by the manufacturer's/contractor's structural engineer.
8. All manufacturer's product information, specifications, installation instructions and maintenance data for care and cleaning of all shade structure components.
9. The contractor shall be responsible for securing necessary building permits for the shade structure, if required.

4.16 SITE FURNISHINGS

Town standard site furnishings shall be provided for all parks (e.g., benches, bike racks, waste receptacles, picnic tables, etc.) Should the park's context or design approach require unique or customized furnishings to support the desired aesthetic, alternatives may be considered by the Town based on design merit, on a project specific basis.

Similarly, where Town standards do not currently exist, selection of appropriate furnishings will be conducted in coordination with Town staff in consideration of context, costs, and maintenance requirements.

Specific minimum requirements are as follows:

1. Install site furnishing products true, plumb, and firmly anchored as per manufacturer's specifications.
2. Site furniture shall be mounted to concrete paved surfaces/pads or be secured to concrete footings.
3. All fasteners and anchors used to secure furnishings shall be stainless steel, unless alternatives are approved by the Town.
4. Submit the following to confirm design compliance and for Town record:
 - a) Engineered fabrication drawings for each site furniture product, outlining the materials, colours, and options for approval by the Town, prior to fabrication.
 - b) All manufacturer's product information, specifications, installation instructions and maintenance data for care and cleaning of all site furnishing components.
5. For parkland, the following site furnishings shall be supplied by Toronto Fabricating and Manufacturing Co., (905) 891-2516:

Bench

- Model No.: 1077-S
- Metal Finish: Hot dipped galvanized
- Colour: Primed and painted - Black
- Footing/Attachment: Secured to concrete pad with stainless steel tap-con fasteners

Bicycle Ring

- Model No.: 937SM
- Metal Finish: Hot dipped galvanized
- Colour: N/A
- Inscription: Park name to be cast into ring
- Footing/Attachment: Surface-mounted to concrete pad with stainless steel tap-con fasteners

5/10-Bicycle Rack

- Model No.: 962BR-5 and 962BR-10
- Metal Finish: Hot dipped galvanized
- Colour: N/A
- Footing/Attachment: Free-standing or surface-mounted to concrete pad with stainless steel tap-con fasteners, as required by Town

6. Specifications for supply of waste receptacles and picnic tables to be confirmed in consultation with Town staff.
7. For standards and guidelines related to sports furnishings for outdoor sports fields and courts, refer to Section 3.

4.17 TOPSOIL & FINISH GRADING

Parkland shall typically receive a minimum of 150mm of topsoil, unless deeper topsoil profiles are required by the Town for special features (pond embankments, naturalized areas, etc.)

Specific minimum requirements are as follows:

1. Imported topsoil for parkland shall be in accordance with the Town's Engineering Standards.
2. Imported topsoil shall be tested in accordance with the Town's Engineering Standards to ensure that the fertility and composition are suitable for use in a public park. Test results shall be submitted to the Town for approval prior to placement. Once topsoil material has been approved for use, the source or stockpile must not be changed without further approval by the Town.
3. Amend native topsoil with soil additives (compost, sand, bonemeal, peat, etc.) or a slow-release fertilizer treatment, where required by soil tests and agronomic analysis as per Item 4.4 of these standards.
4. Schedule placement of topsoil mixture and finish grading to permit sod and seeding operations under optimum growing conditions.
5. Tolerances: all topsoil finish grade surfaces shall be shaped to the grades and cross sections specified within the following vertical tolerances of established grade over a 3m straightedge (not uniformly high or low):
 - a) General landscape areas, embankments, ditches and swales: +/-25mm
 - b) Sports fields and courts: on a project specific basis
6. For standards and guidelines related to topsoil/rootzone for outdoor sports fields, refer to Section 3.

4.18 SODDING

All high-use areas of parks shall be sodded. Select areas may also be considered for seeding (hydro-seeding and/or terra-seeding) at the sole discretion of the Town.

Specific minimum requirements for sod are as follows:

1. Sod for general parkland shall be in accordance with the Town's Engineering Standards.
2. Provide source of sod for approval by the Town. Once sod source has been approved, it must not be changed without further approval by the Town.
3. All sodding shall occur within 7 days of topsoil placement and finished grading. The developer will be responsible for weed eradication if they fail to place the specified sod within this period.
4. Ensure finished sod surface is flush with adjoining grass areas, pavement or top surface of curbs and provide close contact between the sod and the underlying root zone mix by rolling with a light roller.
5. Water sod immediately after laying to obtain moisture penetration into top 100mm of topsoil.
6. On slopes, lay sod sections longitudinally along contours and start laying sod at the bottom of the slope.
7. Peg sod on slopes steeper than 3:1 with wooden pegs (17 x 8 x 200mm) or approved proprietary system. Pegs shall be staked 100mm below top edge of the first sod sections at 200mm O.C. and not less than 4 pegs per square meter with pegs driven to 50mm above surface. Remove sod pegs after sod has established.
8. Maintenance requirements during contract establishment and warranty periods, warranty duration, and sod acceptance criteria will be determined by the Town and developer prior to tendering.
9. For standards and guidelines related to sodding of outdoor sports fields, refer to Section 3.

4.19 SEEDING

Naturalized areas, no-mows, and environmental rehabilitation areas shall be seeded with native seed mixtures, as directed by the Town.

Specific minimum requirements are as follows:

1. Terra-seed and mulch all naturalization areas with an approved meadow mix.
2. Hydro-seed and hydro-mulch turf grass seeded areas (or naturalization areas) when approved by the Town for project specific reasons.
3. All seeding and mulching shall occur within 7 days of topsoil placement and finished grading. The developer shall be responsible for weed eradication if they fail to place the specified seed and mulch within this period.
4. For each seed mix application, the permanent seed mix, annual nurse crop, mulch type and associated application rates should be identified. This includes the seed supplier's product name and code (if a proprietary mix) and the type and percentages of seed types in each mix.
5. Turf seeding shall be performed between April 30 and November 1 and naturalization meadow mix seeding shall be performed between April 30 and November 30.
6. Seed shall be delivered in containers with the appropriate 'certified seed' tag attached in accordance with the regulations of the Canada Seeds Act.
7. Ensure that the soil is moist to a depth of 150mm prior to seeding.
8. Maintenance requirements during contract establishment and warranty periods, warranty duration, and seed acceptance criteria will be determined by the Town and developer prior to tendering.

4.20 TREES, SHRUBS, & GROUNDCOVERS

Trees, shrubs, and groundcovers shall be planted in parkland to rehabilitate lost or disturbed forested areas, buffer or support existing natural landscapes, enhance community aesthetics, and to provide improved micro-climactic conditions for park users (e.g., shade, windbreaks, controlled snow drifting, etc.)

Specific minimum requirement are as follows:

1. General Plant Material shall be in accordance with the Canadian Landscape Standard (latest edition), published by the Canadian Nursery Landscape Association (CNLA) and the Canadian Society of Landscape Architects (CSLA), except where specified otherwise.
2. Trees: All trees shall be supplied balled and burlapped or in wire baskets (no potted material will be accepted) and shall meet following minimum criteria:
 - a) Deciduous trees shall be a minimum of 50mm caliper with their lower branches limbed up above 1.8m from the ground-plane;
 - b) Ornamental and multi-stem trees shall be a minimum of 40mm - 50mm calliper dbh;
 - c) Coniferous trees shall be supplied at a minimum height of 1.5m;
 - d) Trees shall possess a dominant central leader that is either un-pruned or has been re-trained at the nursery using appropriate horticultural practices. Trees with cut or co-dominant leaders will not be accepted.

4. Shrubs/Perennials/Groundcovers: are to be supplied potted and shall meet the following minimum criteria:
 - a) Deciduous and coniferous shrubs shall be supplied in 3 gal. pots, minimum;
 - b) Perennials, ornamental grasses, and groundcovers shall be supplied in 1 gal. pots, minimum;
 - c) Shrubs, perennials, and groundcovers chosen for areas where visibility and surveillance are key objectives should be no higher than 1.0m (at maturity).
5. Planting Soil Mixture shall be 50% screened topsoil, 20% coarse sand, and 30% compost, as specified. Provide source and sample of soil mixture for approval by Town prior to commencing work.
6. Mulch to be shredded cedar bark, free of dyes and chemicals, or approved equal.
7. Tree Stakes to be 40mm x 40mm x 5mm x 1800mm long heavy-duty gauge T-bars.
8. Ties to be 50mm wide burlap strips looped in a loose figure 8 or another woven biodegradable tie system that remains flexible during winter months.
9. Trunk Protection to be 100mm dia. HDPE pipe, 500mm long or to lowest branch, except in naturalization areas where it is to be white spiral plastic tree guard.
10. Remove stakes and ties 1 year after planting and remove trunk protection at the completion of the contract warranty period.
11. For tree and shrub groupings, provide a continuous mulched understorey that is 75mm deep and continuous across the entire planted area.
12. Trees shall only be planted once finished grade has been established.
13. Plants installed during the period between May 15th to October 15th for which a Certificate of Substantial Performance has been issued, shall be warranted for twelve (12) months from date of Substantial Performance, providing adequate maintenance has been provided.
14. Plants installed after October 15th for which a Certificate of Substantial Performance has been issued, shall be Warranted for twelve (12) months from May 15th of the following year, providing adequate maintenance has been provided.
15. Plant material must be replaced during the warranty period, as required by the Town. Replacement of plants only at the end of the warranty period will not be acceptable.
16. The Town will accept trees only after it is verified that all plants and materials meet the following criteria:
 - a) completely free of disease and/or insect infestation;
 - b) are in a healthy and vigorous growing condition;
 - c) corrective pruning has been completed;
 - d) tree stakes are removed;
 - e) all accessories are in good condition as specified;
 - f) planting areas and tree saucers are freshly cultivated and free of weeds and debris.

PART 5 PARK DRAWING REQUIREMENTS

The following section is intended to serve as a supplemental to the Town of Wasaga Beach Engineering Standards. As such, applicants and consultants involved in park development projects shall ensure that they adhere to the submission, drawing, and approvals process outlined through the Engineering Standards.

5.1 PARK DESIGN DRAWINGS

Park drawings shall be in AutoCAD format and shall consist of the following:

- Cover Sheet
- Existing Conditions, Site Protection, & Removals Plan
- Tree Inventory/Preservation Plan
- Layout Plans
- Grading Plans
- Planting Plans
- Detail Sheets including standard and special details with material and construction specifications
- Electrical & Lighting Plan
- Irrigation Plan
- Other Plans as required

All drawings must be in AutoCAD format acceptable to the Town and shall be stamped, signed, and dated by a Professional Landscape Architect or Engineer, where applicable (e.g., supporting civil, structural, electrical, and/or mechanical engineering works). The digital submission of design drawings shall be in pdf file format.

The following standards shall be adhered to in preparation of these drawings.

1. Drawings shall be metric size A1 (594 mm x 841 mm)
2. Scales for drawings shall be as follows:

General Overall Plan Drawings	1:250 or 1:300
Plan Enlargement Areas	1:100 or 1:150
Elevation Drawings	1:25 or 1:50
Details	1:10, 1:20, or 1:25

Scales shall be shown on all drawings

3. The drawings shall show clearly:
 - a) all street names in larger font and bold;
 - b) all lot lines and numbers per registered plan of subdivision;
 - c) north arrows pointing towards the top or right of page;
 - d) Geodetic or temporary benchmark locations (brass tablets)
 - e) Town's name in lower right corner;

- f) up-to-date revisions block;
 - g) ditch/swale and berm details, profiles and cross-sections;
 - h) grading, complete with underside of footing, basement floor, top of foundation wall, first floor elevations and site corner elevations existing and proposed, recommended seasonal high ground water table (where park building are proposed/present and applicable);
 - i) snow storage areas to demonstrate that there are no conflicts with proposed plantings;
 - j) all existing and proposed light standards and servicing and utility infrastructure (above and below ground);
 - k) all limits of construction and phasing;
 - l) all easements and appropriate labels;
 - m) any special design information not covered by standard drawings;
 - n) key plan on each drawing;
 - o) supporting engineering drawings for civil, structural, electrical, or mechanical prepared in accordance with the Town's Engineering Standards;
 - p) any other requirement of the Engineering Standards not listed but relevant.
4. The Developer's Landscape Architect shall add their professional seal, signed and dated, to all submitted drawings.
 5. All drawings shall include a blank/empty box location within the title block for the Town to stamp "Accepted for Construction", near the stamp of the signing landscape architect or engineer, where applicable. On the cover sheet/index, staff will affix the stamp at the bottom right-hand corner such that the stamp may be visible when drawings are folded or rolled.
 6. The Town Engineer shall be consulted as to the manner of showing information not set out in the above requirements.

APPENDIX I

Water and Sewer Service Record Sheet Template



Water & Sewer Service Record

ROLL NO: _____

Municipality: _____

Street & No: _____

Project Name: _____

Contract No: _____

1. As Constructed Service Location *(to be completed by Town)*



Please fill out boxes 2, 4, 5 below

<p>2. Proposed Service Location</p> <p style="text-align: center;"><i>Property Owner to indicate service location and if additional services are requested. Indicate distance to lot line. This example requests 2 services.</i></p> <p style="text-align: center;">Add your Lot Number</p>	<p>3. Type of Pipe & Diameter</p> <p>Water: _____</p> <p>Sanitary: _____</p> <p>Invert Elevations:</p> <p>Water: _____ Sanitary: _____</p> <p>Depth to invert at end:</p> <p>Water: _____ Sanitary: _____</p>
<p>4. Remarks: <u>Please add any comments including dist. from window sill to basement floor</u> <u>Please Provide a contact Telephone number</u></p>	
<p>5. I, The undersigned, agree that the service connections should be as shown above in 2.</p> <p style="text-align: center;"> _____ <i>Month, Day, Year</i> Owner's Name (Print) Owner's Signature Date </p>	
<p>6. To the Best of our knowledge, the dimensions shown in 1. above is correct.</p> <p style="text-align: center;"> _____ <i>Month, Day, Year</i> Consultant Compiled By Date </p>	
<p>7. Permit Issued</p> <p>_____</p> <p>Date and Initials</p>	<p>8. Private Service Accepted</p> <p>_____</p> <p>Date and Initials</p>



Water & Sewer Service Record

ROLL NO: _____

Municipality: _____

Street & No: _____

Project Name: _____

Contract No: _____

1. As Constructed Service Location



<p>2. Proposed Service Location</p>	<p>3. Type of Pipe & Diameter</p> <p>Water: _____</p> <p>Sanitary: _____</p> <p>Invert Elevations:</p> <p>Water: _____ Sanitary: _____</p> <p>Depth to invert at end:</p> <p>Water: _____ Sanitary: _____</p>
<p>4. Remarks: _____</p> <p>_____</p> <p>_____</p>	
<p>5. I, The undersigned, agree that the service connections should be as shown above in 2.</p> <p>_____</p> <p style="text-align: center;">Owner's Name (Print) Owner's Signature Date</p>	
<p>6. To the Best of our knowledge, the dimensions shown in 1. above is correct.</p> <p>_____</p> <p style="text-align: center;">Consultant Compiled By Date</p>	
<p>7. Permit Issued</p> <p>_____</p> <p>Date and Initials</p>	<p>8. Private Service Accepted</p> <p>_____</p> <p>Date and Initials</p>