



DEVELOPMENT CRITERIA AND STANDARD DRAWINGS

November 2023

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1.0 INTRODUCTION

These Criteria and Standards for the Municipality of Meaford (the “Municipality”) identify parameters, performance, and submission requirements for:

- i. Site plan applications,
- ii. Plans of subdivision and condominium, and
- iii. Municipal capital works projects.

1.1. Intent

The Criteria and Standards are intended to:

- i. Validate that private development project and municipal capital works project designers have considered the municipal servicing requirements of the proposed project and that necessary municipal infrastructure capacity is available AND allocated to the project before the project can proceed.
- ii. Establish minimum requirements for materials, measures, devices, and finishes that:
 - a. align with the asset management capabilities and life cycle expectations for infrastructure to be conveyed to the Municipality or is owned and maintained by the Municipality; and,
 - b. use municipal specifications and details found in the Ontario Provincial Standards for Roads and Public Works (known as OPSS.MUNI).
- iii. Demonstrate that sufficient land has been allocated for conveyance to the Municipality for public uses including road allowances, non-motorized transportation infrastructure, stormwater facilities, and other necessary lands identified in the project design.
- iv. Identify minimum access requirements for municipal emergency services providers.
- v. Be a schedule in all types of development agreements.

1.2. Exceptions

Exceptions to these requirements may be considered on a case-by-case basis prior to commencing detailed design and will ONLY be approved in the form of a signed letter from the Municipality. The municipal approval letter will be referenced in the development agreement. Deviation from the Development Criteria and Standards without written approval will be deemed non-compliant and the review process will be stopped. **Revisions made to non-compliant submissions will be considered a new submission and review timelines will reflect the new submission date.**

1.3. Duty of Care

Private development and municipal capital works project designers are responsible for the duty of care required:

- i. by law,
- ii. by their professional licensing bodies, and,
- iii. by industry standards, for their submissions to the Municipality.

The Municipality assumes no liability for design.

2.0 DEFINITIONS

“**AADT**” means Annual Average Daily Traffic.

“**AODA**” means The Accessibility for Ontarians with Disabilities Act.

“**AWWA**” means American Water Works Association

“**BMP**” means Best Management Practices.

“**benching**” means the infill concrete between the walls of a maintenance hole and the pipes.

“**boulevard**” means a part of municipal property between the road's edge and the sidewalk.

“**catch basin**” means a reservoir or well into which surface water may drain off.

“**chainage**” means points of distance or measurement along a road centreline.

“**CSA**” means the Canadian Standards Association.

“**easement**” means a nonpossessory right to use and/or enter onto the real property of another without possessing it.

“Developer” means proponent for the proposed works independent of the size of the development.

“**encroachment**” means anything that is placed, installed, constructed, or planted within the highway that was not placed, installed, constructed, or planted by the Municipality.

“**ECA**” means Environmental Compliance Approval.

“**Engineering Standards**” means the Engineering standards developed for the Municipality of Meaford, as amended from time to time.

“**development**” means the construction, erection or placing of one or more buildings or structures on land, or altering an existing building or structure that has the effect of substantially increasing its size or usability, or establishing a commercial parking lot, or locating three or more trailers on a site, or any other physical alteration to a site.

“**Development Standards**” means regulations pertaining to the physical modification of the environment including the size and location of structures in relation to the lot.

“**GSCA**” means the Grey Sauble Conservation Authority.

“**hamlet**” refers to localized specific and named zones within existing village urban/suburban areas within the Municipality of Meaford.

“**luminaire**” means a complete lighting unit consisting of,

- (a) a lamp, and
- (b) parts designed to distribute the light, to position or protect the lamp and to connect the lamp to the power supply.

“**mailbox**” means a receptacle from which mail is posted or received.

“**maintenance hole**” means a small, covered opening in the pavement or other surface to allow a person to enter, especially leading to a sewer.

“**MNRF**” means the Ministry of Natural Resources and Forestry or similar.

“**MECP**” means the Ministry of the Environment, Conservation and Parks or similar.

“**MTO**” means the Ministry of Transportation Ontario.

“**Municipality**” means the Corporation of the Municipality of Meaford

“**non-paved surface**” means a surface that is not a paved surface.

“**Noncompliant**” means failing to act in accordance with these engineering standards, applicable law, professional licensing requirements, or industry standards.

“**OBC**” means the Ontario Building Code.

“**Ontario Traffic Manual**” means the Ontario Traffic Manual published by the Ministry of Transportation, as amended from time to time.

“**OPSD**” means the Ontario Provincial Standard Drawings

“**OPSS**” means the Ontario Provincial Standards Specifications.

“**paved surface**” means a surface with a wearing layer or layers of asphalt, concrete, or asphalt emulsion.

“**PDF**” a file format developed to present documents, including text formatting and images, in a manner independent of application software, hardware, and operating systems.

“**private works developer or developer**” is the project owner, or their agent, who has the legal right to carry out the proposed project.

“**qualified person**” is a person who possesses knowledge, training and experience and is familiar with relevant laws and regulations that apply to the subject being considered.

“**Rational Method**” means a simple technique for estimating a design discharge from a watershed.

“**regulatory sign**” has the same meaning as in the Ontario Traffic Manual, except that they do not include a sign listed in subsection 13.0 (2) of the Municipality of Meaford Level of Service document.

“**road allowance**” means land reserved by the government to be used for public roads.

“**roadway**” has the same meaning as in subsection 1 (1) of the Highway Traffic Act which means the part of the highway that is improved, designed, or ordinarily used for vehicular traffic, but does not include the shoulder, and, where a highway includes two or more separate roadways, the term “roadway” refers to any one roadway separately and not to all of the roadways collectively.

“**rural**” refers to all areas outside of defined urban, village or hamlet areas within the Municipality of Meaford

“**shoulder**” means the part of a highway that provides lateral support to the roadway and that may accommodate stopped motor vehicles and emergency use.

“**sidewalk**” means the part of the highway specifically set aside or commonly understood to be for pedestrian use, typically consisting of a paved surface but does not include crosswalks, medians, boulevards, shoulders, or any part of the sidewalk where cleared snow has been deposited.

“**Standards**” compilation of parameters and performance requirements for infrastructure design, capacity, or property characteristics that meet the Municipality’s lifecycle expectations and operations and maintenance capabilities.

“stormwater” means surface water in abnormal quantity resulting from heavy falls of rain or snow.

“streetlight” means an outdoor light or a series of outdoor lights that can be attached to poles, are spaced at intervals along a public street or roadway and are illuminated from dusk to dawn.

“traffic calming” is the combination of physical and passive measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.

“utility” includes any air, gas, water, electricity, cable, fiber-optic, telecommunication or traffic control system or subsystem, fire hydrants, sanitary sewers, storm sewers, property bars and survey monuments.

3.0 DEVELOPMENT SUBMISSION REQUIREMENTS

Minimum submission requirements for compliance with these Standards are listed in this section. **Revisions made to non-compliant submissions will be considered a new submission and review timelines will reflect the new submission date.**

3.1. Drawings and Reports

Private development and public works project submission requirements will be confirmed during a pre-consultation meeting between project designers and representatives of the Municipality. The Municipality will only review resubmissions identified during the preliminary meeting and / or subsequently identified by the Municipality as being required to further support submissions.

3.1.1. Submission

Project designers will provide the Municipality with a cover letter attesting that their submission is compliant with requirements outlined in these Development Criteria and Standards plus any additional items requested during the preliminary meeting.

Project designers shall provide drawings digitally via municipally approved document sharing software and/or one (1) USB flash drive compatible with Microsoft Windows operating system containing **uncompressed PDF files** that are **NOT password protected**, are of the **most current PDF version**, are **less than 25 megabytes** in size, and are **not in folders** as follows:

- i. One (1) PDF file containing a drawing set of multiple pages of plans, profiles, details, notes, etc., in the order common to industry standards. Drawings must be flattened so they do not include layers,
- ii. One (1) PDF file for EACH report/study as separate PDF files.

Files shall be named using the naming convention of **project address content description.pdf** for example:

- i. ProjectAddress_CivilDwgs.pdf
- ii. ProjectAddress_Survey.pdf
- iii. ProjectAddress_SWMReport.pdf
- iv. ProjectAddress_TIS.pdf

Providing additional information that has not been requested, or more advanced stages of design, or more detailed levels of land use entitlements not required for the submission, is at the risk of the project designers. The Municipality may reject additional information or drawings and deem the submission noncompliant.

Note: Native file submissions requiring specific software to be read will be deemed noncompliant unless requested during the preliminary meeting.

3.1.2. Required Drawings

The following drawings are required to be submitted to the Municipality for review based on application type and location as per industry standards (continues next page).

Note: review and approval of Plans of Subdivision and Condominium are the jurisdiction of Grey County. The Municipality will require confirmation that the drawings listed below have been submitted to the County.

Site Plan		Plan of Subdivision/Condominium		Municipal Works	
	Cover Sheet		Cover Sheet		Cover Sheet
	Area Context Plan		Draft Plan of Subdivision /Condominium		Area Context Plan
	Boundary Survey		Area Context Plan		Boundary Survey
	Erosion/Sediment Control		Composite Utilities/Servicing Plan		Erosion/Sediment Control
	Floor Plan		Site Grading Plan		Floor Plan
	Landscape Plan		Tree Preservation Plan		Landscape Plan
	Lighting Plan		Concept Plan		Lighting Plan
	Composite Utilities/Servicing Plan		Topographic Survey		Public Utilities/Servicing Plan
	Roof Plan		Soil Volume Plan		Roof Plan
	Site and Building Elevations		Sanitary Drainage Plan (including external drainage plan where applicable)		Site and Building Elevations
	Site and Elevation Sections		Storm Drainage Plan (including external drainage plan where applicable)		Site and Elevation Sections
	Site Grading Plan		Plan and Profile drawings of all streets, easements, and external works		Site Grading Plan
	Site Plan		Detail Sheets including standard and special details together with material and construction specifications		Site Plan
	Soil Volume Plan		Other Plans as required/requested		Soil Volume Plan
	Topographic Survey		Landscape Plans/Details		Topographic Survey
	Tree Preservation Plan				Tree Preservation Plan

	Sanitary Drainage Plan (including external drainage plan where applicable)				Plan and Profile drawings of all streets, easements, and external works
	Storm Drainage Plan (including external drainage plan where applicable)				Detail Sheets including standard and special details together with material and construction specifications
	Detail Sheets including standard and special details together with material and construction specifications				Composite Utilities/Servicing Plan
	Other Plans as required/requested				Other Plans as required/requested

3.1.2.1. General Drawing Requirements

PDF drawings shall be prepared so that they can be printed at full size ANSI D (22" x 34") or half size ANSI B (11" x 17"/Tabloid/Ledger) and remain measurable using the "scaled to fit" printer option and metric scales.

Every drawing sheet shall include:

- Drawing number,
- Title or description of the drawing,
- Name of firm/organization (address, project affiliation – title or number, etc.) that prepared the drawing,
- Name of project owner,
- Address of project,
- Drawing scale - shown as a ratio and/or graphic,
- Drafter name,
- Reviewer name,
- Engineer's/Architect's/Landscape Architect's/Arborists seal and signature,
- Up-to-date revisions block,
- North arrow (for plans).

3.1.2.2. Drafting Requirements

Plan and profile drawings shall show proposed locations of street lighting, roads, sidewalks, utilities, and walkways, as well as watermains, storm and sanitary sewers and associated appurtenances and sizing calculations. All locations must be established and resolved by the project engineer in conjunction with the utility companies as shown in the typical cross-sections.

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

- All surveys and plans shall be drawn using North American Datum 83 (NAD 83),
- All profiles must be drawn relative to the vertical geodetic datum that is noted on each drawing,
- Scales for drawings shall be metric and as follows:
 - General Layout Plan 1:1 000
 - Plan Drawings 1:200, 1:250 or 1:500
 - Vertical 1:50 or exaggerated as noted.
- East-west streets shall have zero chainage at their westerly limits and north-south streets shall have zero chainage at their southerly limits. Chainages on a plan-profile shall increase from left to right,
- The intersection of centrelines of streets shall be used as zero chainage,
- The centreline chainage is to be shown in ink from the outset, calculated from the final survey,
- When plans must be broken because of curvature, etc., the profile shall be broken so that chainage points in plan and profile coincide vertically,
- When appropriate, drawings shall show:
 - centreline chainage every 20 m or less as required,
 - existing and proposed centreline elevations every 20 m or less as required,
 - all vertical and horizontal curve data,
 - all street names,
 - all lot lines and numbers per registered plan of subdivision,
 - vertical geodetic benchmark (elevation and description),
 - ditch/swale and berm details, profiles, and cross-sections,
 - overall storm and sanitary drainage area and sub-area boundaries,
 - lot grading, complete with underside of footing, basement floor, top of foundation wall, first floor elevations and lot corner elevations existing and proposed,
 - sewer sizes, grades, inverts, structures, material type and classes on plan/profiles, and
 - all existing and proposed utilities,
 - all limits of construction and phasing,
 - all easements, and
 - any special design information not covered by standard drawings.

Other details shall be in accordance with OPSS/OPSD. These Engineering Criteria and Standards take precedence when available. Any Municipal Standard drawings may be printed directly on sheets; however, they may not be edited in any manner.

3.1.2.3. Plan of Subdivision and Site Plan Requirements

Plan of subdivision shall show existing elevations for each lot corner along with contours plotted at 0.5 m intervals. Contours will be extended 30.0 m outside of the development area. Proposed elevations shall be shown at 20.0 m intervals for street centrelines, at lot corners, at building lines, at break points inside yard swales and for the first floor of each house. Minimum specified house grades shall be shown as per the standard drawings. 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.

For site plans, a lot grading plan is required for individual infill lots. Contours will be extended a minimum of 20.0 m outside the infill lot area.

An example of a Certificate of Lot Grading and the checklist can be found in Appendix A. An example of a Lot Grading plan is shown in Appendix B.

3.1.2.4. General Lot Grading Plan Requirements

The general lot grading plans shall show the following grading and miscellaneous detail at a scale of 1:200:

- Proposed ground elevations adjacent to the building and at corners,
- Driveway location and elevations of sidewalk(s) and percent grades,
- Hydrants, utility poles, transformers, telephone pedestals, and sidewalks,
- Water and sewer service locations and elevations, and
- Centre line elevation of roadway adjacent to lot,
- Existing and proposed elevations at lot corners,
- Location of all catch basins and elevation of grates,
- Direction of surface flow,
- Location, grade, and inverts of swales,
- Limit of seeding and sodding,
- Geodetic Benchmark.

3.1.2.5. Lot Development Plans Requirements

After acceptance of the general lot grading plan and prior to the issuance of building permits, the project designer shall submit lot development plans when required for building permit. The submission will be accompanied by a letter that indicates project designer civil engineer approval. The details and content of the lot development plan and the design criteria for lot grading and drainage are outlined in the following sections.

It is expected that most proposed lot development plans would conform to the general lot grading plan. All deviations which are certified by the project designer civil engineer and subsequently accepted by the Municipality will require a revision to the general lot grading plan.

3.1.2.6. House Site Plan Requirements

House siting plans, shall be submitted with the lot development plans to verify locations and elevations of the following:

- Footing, first floor and garage floor,
- Top of foundation wall,
- Windowsills,
- Doorways,
- Patios and walkouts,
- Retaining walls, and
- Geodetic benchmark.

3.1.2.7. Overall Comprehensive Plan of Easements

All lands allocated for the installation of infrastructure, supply of services to the development, and maintenance of services, that are to become easements shall be registered with the Municipality in a form approved by the Municipality.

3.1.3. Report Requirements

The following reports and/or studies are required based on application type. The scope of the reports shall be coordinated with the Municipality prior to commencing work and the Municipality may provide input on the scale and scope of the work.

Note: review and approval of Plans of Subdivision and Condominium are the jurisdiction of Grey County. The Municipality will require confirmation that the drawings listed below have been submitted to the County.

Site Plan		Plan of Subdivision/ Condominium		Municipal Capital Works	
	Arborist Report		Arborist Report		AODA Compliance
	Archeological Assessment		Archeological Assessment		AODA Checklist
	Contamination Assessment		Community Services Plan		Arborist Report*
	Geotechnical Study		Contamination Assessment		Archeological Assessment*
	Hydrological Study		Environmental Assessment		Contamination Assessment*
	Parking Study		Geotechnical Study		Geotechnical/ Hydrogeological Study*
	Functional Servicing Report		Heritage Impact Statement		Hydrological Study*

	Stormwater Report		Planning Rationale		Parking Study*
	Traffic Impact Assessment		Public Consultation Plan		Servicing Report*
	Transportation Impact Study		Functional Servicing Report		Stormwater Report*
	Excess Soils Report		Stormwater Report		Traffic Impact Assessment*
	Heritage Impact Statement		Transportation Impact Assessment/Study		Transportation Impact Study*
	Planning Rationale		Community Design Guide		Excess Soils Report*
	Other reports as requested.		Other reports as requested.		Other reports as requested.

** For municipal capital projects, report requirements will be addressed in the scope of work or request for proposal document; however, if additional reports are required, the consultant shall identify them to the Municipality.*

3.1.3.1. Description of Reports

The following describes the reports to be submitted:

AODA Compliance – a brief explanation of how designs meet the intent to Part IV.1 - Design of Public Spaces Standards (Accessibility Standards for the Built Environment) of Ontario Regulation 191/11: Integrated Accessibility Standards where applicable.

Geotechnical/Hydrogeological Report – prepared by a qualified Geotechnical Consultant showing site soil conditions, soil corrosivity, seasonal high groundwater table, and cathodic protection requirements for underground utilities and appurtenances. Recommendations must be provided for pipe bedding and backfill materials, foundations, retaining walls, slope stabilization and road sub-base, as well as design criteria of road surface materials if conditions dictate requirements for greater than the minimum specified in Section 6.0 Roadways. For development projects, the report shall include analysis of soil and bedrock composition to determine its structural stability and its ability to accommodate development.

Geotechnical report shall address the excess soil characterization, assessment of past uses and sampling and analysis plan in accordance with O.Reg. 406/19. Site registry information shall be provided prior to final permitting.

Arborist Report – study prepared by an ISA certified arborist of individual trees and vegetation on private and public lands impacted by the proposed project, identifying care and treatments required to protect and to preserve trees before, during and after construction on a site.

Archeological Assessment – assessment by a qualified person who identifies and evaluates the presence of archaeological resources on project sites in accordance with the appropriate Provincial Ministry requirements.

Contamination Assessment – environmental site assessment (ESAs), site remediation or risk assessment and the filing of an RSC when required by the Municipality or other jurisdictions.

Hydrological Study – study by a hydrologist or hydrological engineer or geotechnical engineer identifying the properties, distribution, and circulation of water on the surface of the land, in the soil and underlying rocks and the impact on development.

Parking Study – assessment by a transportation engineer or transportation planner of existing parking demand and operating conditions, future anticipated parking requirements and options for mitigating parking issues.

Functional Servicing Report – assessment by a utility engineer assessing the existing public utility capacity (water, wastewater, stormwater) and the ability to service the proposed development.

Stormwater Report – study identifying and addressing methods of accommodating stormwater run-off, stormwater quality, stormwater quantity and erosion and siltation control.

Traffic Impact Assessment/Study – a study prepared by a transportation engineer or transportation planner that assesses the impact of a proposed development on the existing transportation network infrastructure where new development or expansion of existing development will generate more than 50 end trips during the peak hour i.e., 50 dwelling units or an office complex of approximately 1,850 square-metres.

Excess Soils Report – planning requirements supporting proper reuse of excess soil applied to the removal and reuse or disposal of excess soil from some project areas in accordance with O.Reg. 406/19.

3.1.4. Other Approvals

Project designers must coordinate and provide written confirmation of approval from other government departments, ministries, and agencies. The Municipality is not responsible for schedule impacts resulting from external entity approval. External entities may include, but are not limited to:

- Ministry of Environment, Conservation and Parks
- Ministry of Natural Resources and Forestry
- Ministry of Transportation
- Department of Fisheries and Ocean
- Grey and Sauble Conservation Authority
- Canada Post

3.1.5. Professional Seals

All engineering drawings and reports shall be prepared by and stamped and signed physically or digitally by an engineer licensed by Professional Engineers Ontario.

All landscape architecture drawings and reports shall be prepared by and stamped and signed physically or digitally by a landscape architect licensed by the Ontario Association of Landscape Architects.

All architecture drawings and reports shall be prepared by and stamped and signed physically or digitally by an architect licensed by the Ontario Association of Architects.

All arborist reports shall be prepared by and stamped and signed physically or digitally by an ISA certified arborist.

3.1.6. Responses to Municipal Comments

Project designers shall clearly indicate their responses to review comments from the Municipality by placing a numbered revision triangle and cloud around the changed drawing and adding a corresponding numbered triangle to the revisions block of the drawing sheet.

Revisions to reports shall be shown by highlighting the change and including a footnote indicating why the revision was made.

4.0 RECORD DRAWINGS

4.1. Requirements for Substantial Completion

Prior to issuance of the certificate of substantial completion, "Record Drawings" showing the constructed line and grade of roadways and services, including all the grading modifications resulting from final lot grading, must be submitted to the Municipality.

The "Record Drawings" shall be submitted digitally via Municipality approved sharing software, or one (1) USB flash drive. Files must be compatible with Microsoft Windows operating system, NOT password protected, are of the most **current PDF version**, are **less than 25 megabytes** in size, and are **not in folders**.

Files shall be named using the naming convention of **project name_content description.pdf** for example:

- i. Development Project Name_RoadSystem.pdf
- ii. Development Project Name_StormSystem.pdf
- iii. Development Project Name_SanitarySystem.pdf
- iv. Development Project Name_WaterSystem.pdf
- v. Development Project Name_LotGrading.pdf

4.1.1. Road System

- Final elevation of centreline of roadway every 20.0 m,
- Final horizontal curve information,
- Additional information that was required for construction after acceptance of engineered drawings,
- Final benchmarks located in permanent locations throughout the development at sufficient intervals such as on fire hydrants and/or other permanent structures,
- A minimum of two (2) geodetic benchmarks within the development and updates to the benchmarks.

4.1.2. Storm Systems

- Invert elevations of all storm sewers,
- Invert and top of frame and grate elevations of all storm maintenance holes and catch basins,
- Gradients of all storm sewers along with "as-constructed" distances between maintenance holes,
- Any additional information that has been required for construction after acceptance of engineered drawings.

4.1.3. Sanitary System

- Invert elevations of all sanitary sewers,
- Invert and top of frame and cover elevations of all sanitary maintenance holes,
- Gradients of all sanitary sewers along with "as-constructed" distances between maintenance holes,
- Additional information that has been required for construction after acceptance of the engineering drawing.

4.1.4. Water System

- Elevations of top of watermain every 20 m,
- Location by measurement of valves and terminations by swing ties to permanent structures,
- Any additional information that has been required for construction after acceptance of the engineering drawing.

4.2. Lot Grading

- Elevations of the final lot grades for all lot corners and grade change locations for the entire plan of subdivision or site plan,
- Invert and top of grate elevations of all rear lot catch basins,
- Invert elevations of all culverts and all ditches at 20 m intervals,
- Certificate of lot grading for all lots (individual).

4.3. Record Drawing Cautionary Note

Record drawings that do not accurately reflect the built condition will be returned to the project designer for revision. The certificate of substantial completion will be withheld until accurate record drawings are provided.

5.0 EROSION AND SEDIMENT CONTROL

5.1. Provincial Standards and References

OPSS and OPSD's shall apply together with the Municipality's Standards and Grey Sauble Conservation Authority. Where there are any apparent conflicts or discrepancies, the Municipal Engineering Standards and Standard Drawings shall take precedence.

The relevant OPSD and OPSS to this section are as follows:

Ontario Provincial Standard Specifications	Ontario Provincial Standard Drawings (as amended)
OPSS.MUNI 805	OPSD 219.100 Light Duty Straw Bale Barrier OPSD 219.110 Light Duty Silt Fence Barrier OPSD 219.120 Light-Duty Fibre Roll Barrier OPSD 219.130 Heavy Duty Silt Fence Barrier OPSD 219.131 Heavy-Duty Wire-Backed Silt Fence Barrier OPSD 219.150 Sandbag Barrier OPSD 219.160 Fibre Roll Grade Breaks OPSD 219.180 Straw Bale Flow Check Dam OPSD 219.191 Fibre Roll Flow Check Dams OPSD 219.200 Sandbag Flow Check Dam OPSD 219.210 Temporary Rock Flow Check Dam, V-Ditch OPSD 219.211 Temporary Rock Flow Check Dam - Flat Bottom Ditch or Channel OPSD 219.220 Sediment Trap in Ditch OPSD 219.230 Temporary Slope Drain for Sediment Trap OPSD 219.231 Temporary Berm Barrier for Slope Drain OPSD 219.240 Sediment Trap for Dewatering OPSD 219.260 Turbidity Curtain OPSD 219.261 Turbidity Curtain, Seam Detail OPSD 220.010 Barrier for Tree Protection

5.2. Mud-Mat

The Erosion & Sediment Control (ESC) Plan (ref. Section 1.2) shall include the minimum control measures required to address erosion and sediment control resulting from mud tracking onto municipal streets, windblown dust, and waterborne sediments.

A mud mat must be provided with the following requirements at the construction site access:

- Minimum width – 6.0 m,
- Minimum length – 20.0 m,
- Non-woven geotextile as per Materials List placed over the limits,

- 50mm crushed limestone, and
- Minimum thickness – 350 - 450 mm

The Developer will be responsible for clearing all mud tracked onto municipal property and/or adjacent properties to the satisfaction of the Municipality.

5.3. Monitoring and Maintenance

Erosion and Sediment Control is only effective if it is appropriately monitored and maintained. Proponents shall ensure that the following monitoring and maintenance is completed and documented from prior to commencement of site operations until final handover of the infrastructure to the Municipality. This may be extended to full build-out if any significant areas in the opinion of the Municipality.

Site Activity	Frequency	Documentation
Active Construction	Weekly and after each rainfall or thaw event	Inspection report with photos indicating condition of ESC controls, maintenance undertaken, and any spills identified.
Inactive Period (Winter, before house construction commences)	Monthly and after each rainfall or thaw event	
House construction period (after municipal right of way work is complete)	Biweekly and after each rainfall or thaw event	

5.4. Conditions for Removal

ESC may only be removed and monitoring cease once the entire development area is completed and vegetated including all lots such that the risk of sediment transport is eliminated.

Proponents may request a reduction in frequency or area to be inspected if a Phase or area of the project has been completed and fully revegetated including private lots within the development.

6.0 ROADWAYS

6.1. Provincial Standards

OPSS and OPSP's shall apply together with the Municipality's Engineering Standards. Where there are any apparent conflicts or discrepancies, the Municipal Engineering Standards and Standard Drawings shall take precedence.

The relevant OPSP and OPSS to this section are as follows:

Ontario Provincial Standard Specifications	Ontario Provincial Standard Drawings (as amended)
OPSS.MUNI 353 - Concrete Curb and Gutter Systems OPSS.MUNI 355 - Installation of Interlocking Concrete Pavers OPSS.MUNI 316 - Extruded Expanded Polystyrene Frost Heave Treatment OPSS.MUNI 351 - Construction Specification for Concrete Sidewalk OPSS.MUNI 302 - Priming Granular Base OPSS.MUNI 307 - Stockpiling of Patching Materials and Patching of Asphalt Pavement OPSS.MUNI 336 - Micro-Surfacing OPSS.MUNI 334 - Cold Recycling Mix OPSS.MUNI 331 - Full Depth Reclamation with Expanded Asphalt Stabilization OPSS.MUNI 341 - Routing and Sealing Cracks in Hot Mix Asphalt Pavement OPSS.MUNI 333 - COLD IN-PLACE RECYCLED MIX OPSS.MUNI 310 - Hot Mix Asphalt OPSS.MUNI 337 - Slurry Seal OPSS.MUNI 304 - Single and Double Surface Treatment OPSS.MUNI 335 - Cold In-place Recycled Expanded Asphalt Mix OPSS.MUNI 311 - Asphalt Sidewalk, Driveway, and Boulevard and for Sidewalk Resurfacing OPSS.MUNI 301 - Restoring Unpaved Roadway Surfaces OPSS.MUNI 330 - In-Place Full Depth Reclamation of Bituminous Pavement and Underlying Granular OPSS.MUNI 332 - Hot In-place and Hot in-place Recycling with Integral Overlay OPSS.MUNI 320 - Open Graded Drainage Layer OPSS.MUNI 314 - Untreated Granular Subbase, Base, Surface, Shoulder, and Stockpiling OPSS.MUNI 303 - Double Chip Seal	Division 200 - Grading Division 300 - Entrances Division 600 - Curbs and Gutters

6.2. General

Road design shall follow the Transportation Association of Canada Geometric Design Guidelines for Canadian Roads and Ontario Provincial Standard Drawings whichever is more restrictive.

Design Component	Conditions	Design Criteria
Right-of-way Width		20 m width
Pavement Width*	Local/Village	6.5 m (3.25 m lane width)
	Collector/Village	8 m (4.0 m lane width)
	Rural	7 m (3.5 m lane width)
Design Speed	Local/Village	40 km/hr
	Collector	50 km/hr
	Rural	90 km/hr
Minimum Curb Radius	Local/Village	7.6m
	Rural	10 m
Horizontal/Vertical Stopping Sight Distance	Local/Village	45 m
	Rural	85 m
Daylighting	All intersections and changes in alignment greater than 45°	5 x 5 m
Cul-de-Sac	Rural	OPSD 500.010
	Local/Village	OPSD 500.020
	Industrial	OPSD 500.030

All local/village and collector roadways within settlement areas shall be serviced by storm sewers, curb and gutter, and sidewalk facilities. Exceptions to the foregoing may be considered by the Municipality, where it permits the use of granular roadway shoulders and storm ditches in designated areas.

Temporary access roads not owned by the Municipality, leading to the area of the development shall be maintained to a standard equal to the maintenance standards for roadways within the development.

6.2.1. Shared Driveways, Condominium Roads, Private Roads, and Cottage Roads

Any shared driveway, condominium road, or private road that is proposed to serve more than six dwelling units, where existing or future dwelling units' connection to the driveway/road is or will be 76 m or more (measured along the driveway/road centreline) from the driveway/road's centreline intersection with the nearest public road allowance, is to be built to municipal road standards within a dedicated 20 m wide driveway/road easement to allow emergency service vehicle access and staging. A driveway exceeding 76 m may be permitted

if all buildings within the development include sprinklers as per the Ontario Building Code and Meaford's fire services have provided a letter indicating that the proposed fire suppression approach meets applicable requirements.

In the case of cottage roads, with connections to two or less cottages, where there is potential for future additional cottages to connect to the cottage road, a dedicated 20 m wide road easement, within which a road may be reasonably constructed, shall be provided to the Municipality to allow emergency service vehicle access and staging.

6.3. Slow Roads Approach

The following criteria are intended to assist designers in choosing the appropriate combination of features, dimensions, and materials for roads in the Municipality of Meaford to:

- Promote multimodal travel – particularly walkability in areas with or without sidewalks, and
- Distribute trips and turning movements through the creation of a network of roads and access management measures that spread out the traffic rather than concentrating at large intersections that are hostile to other modes.

Slow multi-modal environments are intended to reduce municipal operating costs by reducing the amount of pavement dedicated solely to the movement of motor vehicles. Less paved surface from smaller pavement widths will result in less snow removal costs, less resurfacing costs etc. A distributed network of slow speed streets reduces the potential for highspeed collisions which reduces policing and EMS service requirement promoting a higher quality public realm.

Ultimately, the intent of the slow street's philosophy is to eliminate traffic fatalities and reduce the severity of injuries, respond to the needs of users of adjacent land uses, and support the quality of life of residents.

6.3.1. Slow speed roads

Municipal roads will be designed to operate at a speed of 40 kilometers per hour generally and 30 kilometers per hour along the perimeter of schools and parks. Designers are to employ design speeds of 40 kilometers per hour and 30 kilometers per hour respectively as they design roads.

All design criteria associated with the design of slow operating speed roads shall conform with Transport Association of Canada *Geometric Design Guide for Canadian Roads* and Ontario Traffic Manuals guidance.

Traffic calming through enforcement and the use of traffic control devices are NOT within the purview of these criteria. Traffic control devices are to conform to the current versions of Transport Association of Canada Manual of Uniform Traffic Control Devices for Canada AND Ontario Traffic Manuals.

6.3.1.1. Cross section design

Elements of cross section design can influence road operating speed. Lane widths, intersection curb radii, barriers – including different types of curbs and set back of vertical objects on the side of roads – associated with recovery areas for errant motorists, and horizontal and vertical deflections, all influence operating speed.

Lane widths – see standard drawings in the appendices for dimensions.

- Areas along roads where driveways are spaced more than six meters apart, garages are set back <7.5 meters, driveways are less than 15.0 meters, and there are no dedicated on-street parking bays protected by curbs, may include on-street parking on both sides of a two-way street with a face-of-curb to face-of-curb dimension of 8.5 meters.
- Areas along roads where no driveways exist, on-street parking may be accommodated in dedicated on-street parking bays protected by curbs (known as curb extensions).
- Pedestrian crossings, including at intersections, shall be minimized to the cumulative dimension of travel lanes and not include additional distance for parking. This can be achieved with the use of curbs in the form of bulb-outs.
- Minimize the use of auxiliary turning lanes to reduce pedestrian crossing distances.

Intersection curb radii –

- Curb radii at intersections with low volumes of large wheelbase vehicles shall be 7.6 meters recognizing that large wheelbase vehicles will have to encroach in receiving lanes occasionally.
- Smaller curb radii may be permitted where reasonable and the existing receiving lanes are wider than 3.3 meters.
- Larger curb radii will only be permitted by written approval of the Municipality.

Barrier curbs and setbacks –

- Vertical elements behind curbs within the road cross section promote slower motorist speed as this encourages motorists to focus on near and mid distances.
- The use of vertical barrier curbs shall be employed on slow operating speed roads with higher traffic volumes to allow the locating of trees and other fixed-vertical elements close to the back of curb.
- On roads designed with low design speeds, roll curbs, or shared streets may be permitted with trees and other fixed-vertical elements located as allowed by TAC and OTM.

Horizontal and vertical deflection –

- Horizontal and vertical deflection may be employed to encourage motorists to focus on near and mid distances and slower speed.
- Deflections shall conform to TAC and OTM guidance.
- Vertical deflection shall not be permitted on primary emergency response routes used by fire departments or EMS.

6.3.1.2. Retrofit traffic calming

Retrofit traffic calming measures are those measures added to existing road networks, or roads being reconstructed, to reduce roadway operating speeds. Measures include a combination of features, dimensions, and materials that encourage motorists to operate at slower speeds.

6.3.1.3. Traffic calming measures

A list of measures have been identified in TAC's Canadian Guide to Traffic Calming, second edition, February 2018. Detail drawings can be found in that document. (If a newer edition is published in the future, it shall be used.) The identified measures shall be used in a sequence

and manner described in the Traffic Calming Process and Procedures section. An excerpt of preferred traffic calming measures, from the TAC Canadian Guide to Traffic Calming, includes but is not limited to:

MEASURE	DESCRIPTION
VERTICAL DEFLECTION	
Raised Crosswalk	A marked pedestrian crosswalk at an intersection or mid-block location constructed at a higher elevation than the adjacent roadway.
Raised Intersection	A full intersection, including crosswalks, constructed at a higher elevation than the adjacent roadways.
Speed Cushion	A segmented speed hump which allows for the passage of larger vehicles or buses without difficulty while still reducing passenger vehicle speeds.
Speed Hump / Table	A raised area of a roadway, which deflects both the wheels and body of a traversing vehicle. A speed table is an elongated raised speed hump with a flat-topped section that is long enough to raise the entire wheelbase of a vehicle.
HORIZONTAL DEFLECTION	
Chicane (One-lane, Two-lane)	A series of curb extensions on alternating sides of a roadway, which narrow the roadway and require drivers to steer from one side of the roadway to the other to travel through the chicane. Typically, a series of at least three curb extensions are used.
Curb Radius Reduction	The reconstruction of the intersection corner using smaller radius, usually in the 3.0 to 5.0 metre range.
Lateral Shift	A roadway alignment change, introducing a 'jog' to the left or to the right.
Speed Kidney	An arrangement of three small humps elongated with a curvilinear shape in the direction of traffic. Vehicles are required to take a curvilinear path to avoid the vertical deflection.
Traffic Circle / Traffic Button / Mini-Roundabout	A raised island located in the centre of an intersection, which requires vehicles to travel through the intersection in a circular, counterclockwise direction around the island.
ROADWAY NARROWING	
Curb Extension	A horizontal intrusion of the curb into the roadway resulting in a narrower roadway width.
Lane Narrowing	Reduced lane widths using pavement markings or other features with the intention for drivers to perceive the roadway to be less comfortable at higher speeds.
On-Street Parking	The reduction of the roadway width available for vehicle movement by allowing motor vehicles to park adjacent and parallel to the curb.
Raised Median-Island	An island constructed on the centreline of a two-way roadway to reduce the overall width of adjacent travel lanes.
Road Diet	A reconfiguration of a roadway where the number of travel lanes and/or the effective width of the road is reduced to allocate the reclaimed space for other uses such as bicycle lanes.
SURFACE TREATMENT	
Sidewalk Extension / Textured Crosswalk	A sidewalk that is continued across a local street intersection at the level of the roadway and a textured and / or patterned surface which contrasts

	with the adjacent roadway is incorporated.
Textured Pavement	Roadway pavement that incorporates a textured and / or patterned surface which contrasts other adjacent roadways in the surrounding area alerting drivers of the potential need to reduce speed.
GATEWAYS	
Gateways	A combination of traffic calming devices, such as roundabouts, traffic islands, road narrowing, pavement markings, landscaping, etc. that provide a message to help identify transitional zones between rural areas and the urban / rural residential zones, villages, or hamlets.

6.3.2. Maximizing Trip Distribution

Concentrating trips along fewer roads disproportionately affect the users of adjacent land uses along those roads. Concentrating trips results in capacity issues – needing more than two lanes, wider intersections to manage increased turning movements. This increases crossing distances and makes for a generally poor pedestrian environment.

6.3.2.1. Road network

Creating a network of intersecting streets allows turning movements to be distributed to more than a few streets. This reduces the need for turning lanes on fewer streets which allows for shorter crossing distances for pedestrians at multiple intersections. Intersection spacing should be based on development blocks not exceeding 200 meters in length and be the width of two development lots.

6.4. Construction

6.4.1. Clearing and Grubbing

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 of the subdivision to a disposal area approved by the Developer's Engineer.

Unless noted otherwise, all healthy trees behind the back slope of ditches and not obstructing visibility or installation of services shall be preserved. The Municipality may give special permission to leave trees on the street allowance.

The Developer is responsible to coordinate the delineation of tree clearing to the satisfaction of the Municipality prior to mobilization, including legal survey of the property to ensure that tree clearing does not encroach onto neighboring properties or into adjacent vegetated buffers.

6.4.2. Grading

Situation	Criteria	Design Requirement
Standard Village/Hamlet (Urban) Cross-Section		2% slope towards curb
Village/Hamlet (Urban) Cross-Section - Curb and Gutter – Cut/Fill	Less than 1.5 m grade differential	1.2 m wide boulevard behind curb and maximum 3:1 slope to original grade

	1.5 m grade differential or more	shall not be steeper than 2:1 and ditches shall be located at the toe of the fill slope as required for local drainage.
	3.0 m grade differential or more	cable guide rail system shall be installed conforming to OPSD 913.130 and MTO protection warrants
Rural Cross-section	Standard	The area between the edge of the road shoulder and the street line shall be graded and the ditches cut with side slopes of 3:1 from the edge of the shoulder to the bottom of the ditch and 2:1 from the bottom of the ditch to the original ground.
	1.5 m grade differential or more	the fill slope shall not be steeper than 2:1. The ditch shall be located at the toe of the fill slope.
	3.0 m grade differential or more	cable guide rail system shall be installed conforming to OPSD 913.130 and MTO protection warrants.

- All side slopes, ditches and boulevards to the street line shall be protected with 100 mm of topsoil and nursery sod rolled. Hydroseeding will be considered on a site-specific basis.

6.4.3. Ditches and Culverts

Ditches and culverts shall be sized to take the total expected storm run-off calculated by a recognized design method such as the Rational Method.

Ditches shall be constructed as follows:

- Distance centre to centre of ditches to be as required for the depth of ditch and side slopes.
- Depth below finished shoulder grade:
 - Maximum - 1.20 m
 - Minimum - 0.75 m
- Ditch Grade
 - Maximum - 6.0%
 - Minimum - 1.0% (0.5% with 1 m minimum bottom width)
- Where the groundwater table is at or above the proposed ditch grade, at any time of the year, a perforated drainage tile (minimum 150 mm diameter) wrapped with filter fabric protection shall be provided as per OPSD 216.021 (Wrapped Trench).

Where considered necessary by the Municipality, ditches shall be piped.

Where drainage is conveyed from the roadside ditch to a suitable outlet through an easement it shall be piped using ditch inlets and grates. Storm sewer pipe material shall be concrete, Polyvinyl Chloride (PVC) or Polyethylene (PE), minimum size 300 mm diameter. Concrete pipe material must be ES or Class III. PVC or PE pipe material must be 320 kPa pipe stiffness complete with bell and spigot connections.

Alternatively, with the approval of the Municipality, the Developer may construct a ditch through a block as determined by the Municipality. In exceptional cases where ditches are on easements, ditches with grades greater than 6% may be allowed by the Municipality shall be suitably protected against erosion by means of riprap or gabion baskets. Ditches through easements exceeding 1.2 m in depth shall be fenced off with a standard 1.8 m high chain link fence.

The minimum ditch protection on all ditches shall be 100 mm of topsoil and sod where velocities exceed 1.0 m/s. If the velocity is less than 1.0 m/s, then hydraulically applied seed and mulch may be applied as approved by the Municipality. Where velocities exceed 2.0 m/s, riprap of appropriate size shall be used. All topsoil shall be from a source approved by the Municipality.

Normal ditch to ditch road culverts shall be installed where required as follows:

- Minimum Length: As required from centre of ditch to centre of ditch.
- Minimum Size: 450 mm diameter
- Material: standard galvanized corrugated pipe
- Gauge: as recommended by manufacturer for (Canadian Highway Bridge Design Code) CHBDC-CL-625-ONT truck loading, minimum 2.0 mm thickness (14 gauge)
- Cover: 300 mm minimum at the shoulder of the road for road crossings and all entrance culverts
- Bedding: culverts to be bedded and backfilled with granular material in accordance with OPSS
- End Protection: All road and driveway culverts shall have the ends protected gabions, riprap over filter fabric, no headwalls shall be permitted.
- Where it is necessary to construct culverts under roadways or driveways larger than the minimum size, the cross-sectional end area required shall be calculated in accordance with a recognized design criteria method. Culverts up to 900 mm shall be corrugated metal. Culverts more than 900 mm shall be concrete.
- The Municipality may require guide markers to be placed to mark the ends of the culverts.
- The Municipality may require guiderail systems to be installed if required by roadside safety manual (safety devices).

6.4.4. Road Base Construction

All excavating shall conform to the current OPSS for Grading OPSS 206 and the recommendations of the geotechnical report by a qualified soils consultant (Geotechnical Engineer).

The Developer shall retain a Geotechnical Engineer 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 granular road base shall consist of:

- subbase course of 300 mm minimum Granular "B" full width across the roadway and shoulders
- base course of 150 mm minimum Granular "A" full width across the roadway and shoulders conforming in all aspects to OPSS.

No granular base or surface material shall be placed until the grade on which it is to be laid has been approved by a Geotechnical Engineer and accepted by the Municipality. Proof rolling of the sub-grade shall be witnessed by the Geotechnical Engineer and the Municipality prior to placement of the granular base.

During and between construction seasons, the granular base shall be maintained suitable for vehicular and pedestrian traffic, including dust control, and renewed if required, to the satisfaction of the Municipality.

6.4.5. Asphalt Paving

As soon as the granular base has been completed it shall be thoroughly compacted and shaped. No asphalt shall be placed until the base has been on which it is to be placed has been inspected, repaired as necessary and accepted by the Municipality.

Asphalt work shall conform in all respects to OPSS 310 and as recommended by the Geotechnical Engineer based on soil conditions and proposed loading and traffic.

Asphalt Pavement shall consist of:

- 50 mm minimum thickness of HL4 base course asphalt
- 40 mm minimum thickness of HL3 surface course asphalt.

Surface course asphalt may be placed upon acceptance of the Municipality, which shall not be given for at least one year from the date of placement of the base course or until the following:

- a) Eighty percent (80%) or more of the lots within the development have a home constructed on them; or
- b) Sixty percent (60%) or more of the lots within the development have a home constructed on them and the Certificate of Acceptance (Full Services) has been issued.

Notwithstanding the above, when one or more lots within the development has a home constructed on it, and three (3) years have lapsed since the Certificate of Substantial Completion (Basic Services) has been issued, the Developer shall complete and maintain the surface course asphalt in accordance with the development agreement.

6.4.6. Driveways

Urban and rural entrances shall conform to the respective OPSD 300 series depending on rural or urban and grading conditions.

- The maximum grade for access driveways shall be 6% except in site specific cases. The maximum grade is not recommended and should be employed only in exceptional cases where conditions prohibit the use of lesser grades.
- The minimum grades permissible are 2% on boulevards and 1% on lots.
- Maximum grade change shall be 4% at curb or sidewalk.
- All access driveways shall be located a minimum of 1.5 m from utility poles, hydro transformers, catch basins, hydrants, watermain valves, maintenance holes, telecommunications boxes, and incorporate bollard if requested by the Municipality.
- T.V. junction boxes, water service valve boxes, side lot lines and other driveways. Where frontage limitations interfere with standard locations, site specific solutions shall be detailed in the Plan and Profile and Lot Grading Plans.
- All driveways with curb, gutter and/or sidewalks must include paved aprons, which shall be graded with:
 - minimum thickness of 150 mm Granular "A", and
 - a minimum thickness of 50 mm fine grade hot mix asphalt (HL-4) from the curb to the property line.

The placement of poured concrete and/or interlocking brick will not be allowed between the edge of pavement and the property line.

In areas with roadside ditches, driveway entrance culverts for each lot shall be installed by the Developer. Culverts shall be minimum size of 400 mm diameter and minimum length of 9 m and a minimum of 1.6 mm minimum wall thickness (16 gauge) with minimum end protection of riprap over filter fabric as per OPSD 810.010. Backfill shall be Granular "A" material with a minimum 300mm granular cover over culvert.

6.4.7. Curbs

Concrete curb and gutter conforming to OPSD 600.040 shall be installed along all edges of roadway paved surface as required by the Municipality. The curb shall be dropped at all entrances where known. If an entrance must be cut in after the curb is poured, entrances shall be cut with appropriate and approved equipment.

6.4.7.1. Alternative Curb Application

OPSD 600.070 – Concrete Barrier Curb and Gutter – Two Stage Construction shall be installed along all edges of the roadway paved surface. The second stage shall only be permitted following the satisfactory inspection of the base curb and asphalt by the Municipality.

Curb terminations at the limits of the project shall be either joined to existing concrete curbs or terminated as per OPSD 608.010.

150 mm diameter pipe sub-drains shall be provided under all curb and gutter unless it is deemed unnecessary by a qualified soils consultant to the satisfaction of the Municipality. Sub-drains shall be perforated, corrugated, plastic pipe with geotextile other than the 2.0 m section

of the sub-drain immediately upstream of all structure, which shall be non-perforated, corrugated plastic pipe. Sub-drains shall be bedded in a 300 mm x 300 mm trench below and at each edge of the sub-grade and shall conform to OPSS 405 and OPSD 216.021 (Wrapped Trench).

Concrete shall conform to OPSS for mix-design, placing concrete and curbing. Curb construction shall conform to 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 operations.

6.4.8. Sidewalks and Walkways

6.4.8.1. Sidewalks

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

Concrete sidewalks, when specified shall be 1.5 m wide conforming to OPSD 310.010. Concrete sidewalk ramps at intersections shall conform to OPSD 310.030. Sidewalk construction shall conform to OPSS 351. The minimum thickness of concrete shall be 125 mm except at driveways where the thickness shall be 150 mm. Bedding shall be 100 mm minimum Granular 'A' thoroughly compacted.

- 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 at 1.5 m spacing.

6.4.8.2. Walkways

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

- All walkways shown on the plan of subdivision shall be constructed by the Developer.
- Walkways shall be constructed with 150 mm minimum depth of Granular "A" on a properly constructed foundation.
- Walkways between residential lots shall be paved with 50 mm of hot mix asphalt surface, minimum width 3.0 m, and fenced with 1.5 m high black vinyl chain link fence along both sides in accordance with OPSD 972.130.
- A vegetative screen shall be provided consisting of a composition of trees, shrubs, and ground cover. Walkways shall not exceed 8% in grade longitudinally and shall have a crossfall of 2%.
- All entrances are to be posted with "No Motorized Vehicles" signs and access is to be restricted by a minimum of three (3) removable entrance posts per Standard Drawing STD DWG R.16.

7.0 LOT GRADING

7.1. General

Lot grading shall conform to the following specifications subject to the requirements of the major drainage system and limits on the depth of street flow.

Infill house lot grading shall conform to the requirements set out by the Municipality and as may be amended from time to time.

7.2. Grades

Generally, all lots shall be excavated or filled so that the whole of the lot area from the street line to a line at least 3 m beyond the rear of the building shall have an elevation of between 300 mm and 1.5 m higher than the finished crown of the road opposite the centre of the lot. In situations where the slope of the land justifies different requirements, the Municipality may permit variations of the above. The Municipality has the right to amend any of the proposed grades if a particular situation so warrants.

Lots are to be designed with a 5% grade for 1.5 m to 3.0 m from the house foundation.

The slope from the curb to the rear of the building shall be a minimum of 2% and maximum of 5%.

Yard areas shall be designed with 1% to 5% grades. Non-yard areas shall have a maximum grade of 30%. A soils stability report is required if slopes steeper than 30% are proposed.

Any lot with a 10% average grade may require split level dwellings and cross-sections shall be required.

Rear yard and side yard swales shall be designed with 1% minimum to 5% grades depending on flow and shall generally be 2% where possible.

150 mm diameter sub-drains shall be provided under all swales where gradients are less than 1.0%. Sub-drains shall be perforated, corrugated, plastic pipe with geotextile wrap. Sub-drains shall be bedded in a 300mm x 300mm clear stone trench and wrapped with filter fabric.

In general, catch basins on private property (i.e., rear-yard) are not permitted, except where justified and Municipality approved necessity exists **and** are located such that any clogging or flooding will result in overland flow via a major storm route and will not impact adjacent structures. Requirements for rear-yard catch basins shall be as per Section 8.5.5.

Where required, grading of the septic tank and leaching bed areas shall be minimized and shall not exceed the boundaries of the system approved by the Municipality's building official. In no case shall the surface runoff from the disposal system site be directed toward an adjoining lot unless such runoff follows an existing natural watercourse or depression, nor shall any drainage be directed into the leaching bed area.

7.3. Sodding and Seeding

Each lot is to receive a minimum of 100 mm thick topsoil, and screened free of stones, debris, and woody material, and be sodded from the street line to the rear building line of the dwelling. The remaining area is to be seeded. Seed and sod must be of a quality satisfactory to the Municipality.

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

7.4. Grading of Other Lands to be Conveyed

Any area of land deeded to the Municipality for public purposes other than highways shall, to the extent possible, maintain natural preconstruction water flow by grading to preserve natural drainage patterns and where appropriate minimize drainage impacts to adjacent properties. Care must be taken to preserve existing and proposed trees.

The impacted areas shall have or receive at least 150 mm of topsoil and shall be seeded with approved lawn seed according OPSS.MUNI 804 and to the acceptance of the Municipality.

8.0 STORM DRAINAGE SYSTEM

8.1. General

The requirements of the Municipality, MECP and GSCA will apply. Any MECP Environmental Compliance Approvals (ECA) will be transferred to the Municipality upon acceptance of the storm drainage system. All systems must provide quality and quantity control in accordance with Design Standards or MECP Guidelines.

Design and system collection must refer to the MECP Stormwater Management Practice, Planning and Design Manual (March 2003) and its subsequent revisions.

Generally, stormwater run-off shall be accommodated by a system of catch basins, maintenance holes and storm sewers or by roadside open ditches and culverts. Storm sewers will be required when the roadside ditches are not able to convey the five-year return frequency storm, when the ditch exceeds the maximum depth or when the ditch grades exceed six percent (6%). Where curb and gutter are used storm sewers shall be provided to serve the whole of the development.

In all cases the designer must have regard for impacts on receiving water courses, river front and public beach areas.

8.2. Services 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 area and outlets to the appropriate adjacent storm sewer or watercourse. This may require assumption to be made for post development initiatives of adjacent future development lands that outlet to the stormwater management facilities. The exact location for connecting storm sewers or channels to adjacent storm sewers or areas shall be approved by the Municipality.

8.3. Easements

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 accepted by the Municipality.

The Developer will obtain at no expense to the Municipality by deed or grant of easement in a form acceptable to the Municipality rights in land for drainage through lands other than its own. The Municipality shall be 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 Municipality in the manner herein identified.

Lands designed as overland flow routes, drainage, corridors, or spillways shall be deeded to the Municipality 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

(Owen Sound) Storm event. The minimum width of these blocks is 6.0 m. The design of drainage blocks must be verified using Hydrologic Engineering Centres River Analysis System (HEC-RAS) software 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 final design submissions.

8.4. Drainage and/or Stormwater Management Report

The Drainage and/or Stormwater Management Report setting out the existing and proposed drainage system shall be submitted for acceptance by the Municipality. The report may also have to be approved by the MECP, the MNR, and the GSCA. This report among other things shall pay particular attention to the following:

- 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.
- The possible obstruction of natural drainage patterns by development and buildings and proposed mitigation measures as necessary.
- Details of a suitable drainage outlet(s) from the subdivision.
- Natural watercourses entering the subdivision and adjacent lands draining to the subdivision and protective measures incorporated into the design to preserve these features.
- 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. When computer modeling is used, the report shall indicate model parameters and assumptions used to give outflow hydrographs and hydraulic grade line levels where applicable.

This report shall provide recommendations for dealing with all drainage which affects the design of drainage works for the development and such recommendations, when accepted by the Municipality shall be incorporated into the Engineering Drawings.

8.4.1. Design Flows

Potential increases in run-off rates resulting from new development shall be controlled as required by the Municipality. Where downstream constraints exist such as those established by the 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 Owen Sound return frequency storm generally 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 Municipality that runoff will have no adverse effects. Similarly, for the major system, post-development run-off from a 100-year return frequency storm generally shall not exceed the pre-development run-off for the same storm.

8.4.2. Methods of Computation

Pre-development peak flows shall be computed by a method such as the Rational Method or by an approved computer model. Watershed definition and pre-development flows must be accepted by the Municipality.

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

The Owen Sound rainfall intensity-duration-frequency equations or their curves and design storm hydrographs are to be used for storm sewer pipe sizing calculations, which must be accepted by the Municipality.

Run-off coefficients for the Rational Method are given by component of surface treatment and by Land Use. The Land Use values, provided in Table 1, are intended as a guide only. The designer is encouraged to develop an appropriate co-efficient using a composite calculation, which is subject to the acceptance of the Municipality.

Rational Method Run-off Coefficients by Land Use

Description	R
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	0.30-0.50
Multiple-Detached	0.40-0.60
Multiple-Attached	0.60-0.75
Commercial Lots	0.40-0.85
Park, Recreation Centre, Cemetery (With Any Roof Leaders or Pavement to Sodded Areas)	0.25
Unimproved Open Space Under 7% Slope	0.25
Unimproved Open Space Over 7% Slope	0.30

For estimating flows from storms larger than the 5-year return storm the run-off co-efficient 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. Co-efficient 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 Formulae shall be used to determine the capacity of the storm sewers. For concrete and PVC storm sewers, a roughness co-efficient of 0.013 shall be used. For corrugated pipes used as culverts, not storm sewers, an appropriate roughness co-efficient 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. Surcharged design may be considered for higher design levels where suitable methods are used, or where foundation drains are not connected to the storm sewer, subject to the acceptance of the Municipality.

8.4.3. Design Levels

The system is to be designed to provide convenient drainage from minor storm events and flood protection from major storm events.

8.4.3.1. Minor 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.

Exceptions to this may be considered under the following circumstances and subject to acceptance by the Municipality:

- (a) When the major system is inadequate either because there is no outlet for overland flows or there is insufficient surface detention potential, the storm sewer system shall 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.
- (b) When the major system has a high capacity due to steep slopes or proximity to outlets, and where foundations drains are protected from flooding, the storm sewer system may be designed for a 2-year return frequency storm.

8.4.3.2. Major System

Run-off rates more than 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 defined in the following table.

LOCATION	STORM RETURN FREQUENCY (YEARS)		
	5 year	25 year	100 year
Walkways and Open Spaces	Minor Surface Flow Up to 25 mm Deep on Walkways	As required for Overland Flow Outlets	As Required for Overland Flow Outlets
Local, 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
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
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
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.
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 to a safe outlet at low points. Outlets can be walkways or open sections of roadways leading to parks, open spaces, or river valleys.

8.4.4. 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.

8.4.1. Detention & Retention Facilities

Where deemed necessary by the Municipality 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" and dedicated by the Developer to the Municipality. It 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 flow without failure. Suitable erosion protection shall be provided downstream of the outlet for all flow conditions. Operation during spring snow melt or freezing conditions shall be investigated, and any required changes shall be incorporated.

The following general requirements shall apply when designing stormwater management facilities:

- Permanent pool volume will be determined based on Table 3.2 of the MECP Stormwater Planning & Design Manual.
- Erosion control storage shall be sized to accommodate the total runoff volume from the development during a 4-hr – 25 mm Chicago storm event and released over a minimum of 24 hours. Notwithstanding this, 40m³/ha of extended

detention volume shall also be provided per Section 3.3.2. of the MECP Stormwater Planning & Design Manual.

- Site fencing shall be provided in areas where necessary for safety reasons where maximum slopes cannot be met or at headwalls.
- Warning signage shall be erected and clearly visible at all access points to applicable stormwater management facilities.
- Side slopes shall be in accordance with Table 4.6 in the MECP Guidelines.
- Areas less than 5 ha subject to the collection of contaminants or spills shall be fitted with adequate oil/grit separators. This shall include snow storage areas and large vehicle parking areas.
- A landscaping plan of the SWM Pond must be provided.
- A minimum 4 m wide paved or granular maintenance access shall be provided with turn around as necessary to ensure that access is provided to inlet, outlet, sump points and sediment drying area.
- A sediment drying area shall be provided adjacent to the maintenance access road and forebay and shall be appropriately sized for sediment drying. It shall have a maximum slope of 5%, draining back towards the forebay. No trees or shrubs will be planted within the drying area.
- All Stormwater Management Facilities shall be designed with a maintenance drawdown pipe complete with a methodology to allow for controlled release during maintenance.
- The invert of the spillway shall be at or above the calculated high-water level of the facility, while maintaining 0.3m of freeboard above the calculated high-water level.

8.4.2. Water Quality

The selection of Best Management Practices (BMP) for water quality control shall be investigated as directed by the Municipality. When selecting the designing BMP's, reference should be made to the MECP Stormwater Management Practices Planning and Design Manual (March 2003) and its subsequent revisions.

The BMP selection process shall review all environment constraints and provide rational for the selection of alternatives for a specific site as outlined in detail in the above noted MECP 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 hydrogeological and soils investigation report. Runoff 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, infiltration ponds for extended detention facilities shall be considered.

Wet facilities shall be considered only if all other BMP's have been proven not feasible or ineffective.

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 Stormwater Management Practices (SWMP) methods in a “treatment train”, in accordance with MECP SWMP manual guidelines.

8.4.3. General Design Criteria for Piping

Generally, storm sewer systems shall be designed in accordance with the MECP and MTO Guidelines.

8.4.3.1. Downstream Size

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

8.4.3.2. Roof Leaders

Roof leaders are to be discharged to the ground surface to splash blocks and flows to be directed away from the building to side yard and rear yard swales in such a way as to prevent ponding or seepage into weeping tile. In residential development, where side yard and/or rear yard swales are not incorporated in the design roof leader soak away pits (Std. ST-1) shall be required as part of the stormwater management design.

Where flat roofs are used, as in commercial or industrial sites, detention roof hoppers requiring smaller or fewer roof leaders may be used as part of the stormwater management design. No connections are to be installed directly to storm sewers.

8.4.3.3. Foundation Drainage

The underside of footing elevations must be a minimum 0.3 m above the seasonal high groundwater table as determined by the Geotechnical Engineer.

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

Foundation drains shall not be connected to either storm sewer or sanitary sewers. Foundation drains are to be discharged to the ground surface to splash blocks and flows to be directed away from the building to the side/rear lot swales in such a way as to prevent ponding or seepage into weeping tile.

8.4.3.4. Storm Service Connections

Storm Service Connections may be considered in Commercial and High-Density Residential Areas on a case-by-case basis if an infiltration option is not available.

8.4.3.5. Municipal Drains

Where development proposals include any sort of alterations to a municipal drain, the Developer is required to petition the Municipality in accordance with the Municipal Drainage Act. Regulations and specifications in the Ontario Drainage Act shall be strictly adhered to and the design specified by Engineer’s report for the Municipal Drain shall be met.

8.5. Storm Sewer Design

8.5.1. General

Where curb and gutters are required, storm sewers shall be provided to serve the whole of the development.

The storm sewer system shall be designed by a recognized engineering method such as the Rational Method using the 5-year Owen Sound rainfall intensity curve and a maximum intensity based on a minimum time of concentration of 15 minutes at the inlet of the storm sewer system.

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

8.5.2. Materials

All materials shall be Canadian Safety Association (CSA) Certified.

Storm sewer pipe material shall be concrete, PVC or HDPE, minimum size 300 mm diameter.

- Concrete pipe material must be ES or Class III.
- PVC and HDPE pipe material must be 320 kPa pipe stiffness complete with bell and spigot connections.

Catch basin leads shall be:

- 250 mm for single catch basins,
- 300 mm for double catch basins.

8.5.3. Maintenance Holes

Concrete maintenance holes shall be provided at all changes in direction of the storm sewer and at all street intersections, but no further apart than 100 m. Maintenance holes shall be 1200 mm inside dimensions. Benching shall be provided in all storm maintenance holes. All maintenance hole frames and grates shall conform to OPSD.

For any change in elevation of more than 600mm, an external drop structure shall be provided as per OPSD 1003.010.

Where maintenance holes are in areas to be flooded by the major storm design, maintenance hole covers shall be of the sealed variety. In all areas standard maintenance hole covers shall be used.

8.5.4. Catch Basins

- Catch basins shall be provided on both sides of the street in all low areas but no further apart than 60 m.
- Double catch basins shall be provided at all sags in the street. Catch basins shall have sumps. All catch basins, frames and grates shall conform to OPSD.
- Catch basin leads shall be connected to the main storm sewer through a maintenance

hole except where the main storm sewer size exceeds 450 mm diameter, in which case the lead can be connected directly to the main storm sewer with manufactured tees.

- Catch basin leads shall be minimum 250 mm at 1.0% grade for single catch basins and 300 mm at 0.7% grade for double catch basins.

Catch basin inlet capacities shall be determined in conjunction with the overall stormwater management system. On roadways, catch basins shall have a minimum capacity to collect the run-off from the 5-year return frequency storm, sufficient catch basin capacity shall be provided to permit the design flows to enter the storm sewer system. Inlet control devices may be used where the hydraulic grade line needs to be strictly controlled i.e., to prevent surcharging of the storm sewer line.

8.5.5. Rear Lot Catch Basins

Rear lot catch basins are only permitted where clear justification is provided that another drainage solution is not feasible.

Connections for private catch basins serving a single lot shall be regarded as service connections and shall be the responsibility of the lot Owner to maintain. Where several lots drain to a rear lot catch basin on private property, an easement shall be provided for the catch basin drain lead to the outlet structure shall be located along the side or rear yard lot line.

- Each rear lot catch basin shall service a maximum of six (6) lots.
- Rear lot catch basins shall be as per OPSD 705.030 and do not require sumps.
- Side yard easements for rear lot catch basins shall be minimum 6.0 m, or as stipulated by the Municipality.
- Pipe installation shall be 0.8 m offset the property line to the centerline of the pipe.
- All rear lot catch basins to be connected to a catch basin maintenance hole at the curb line.

8.5.6. Installation

Storm sewer construction shall conform to the requirements of the OPSS and OPSD for storm sewer construction per OPSS 410.

Flexible pipes shall be embedded in accordance with OPSD 802.010, and rigid pipe shall be bedded in accordance with OPSD 802.031.

8.5.7. Testing and Acceptance

The complete storm sewer system must be cleaned, flushed, and inspected by an approved CCTV video camera testing company in accordance with OPSS 409 and the Municipality shall be provided with a copy of the appropriate data prior to the issuance of the Certificate of Substantial Completion "Basic Services" and within one month prior to the placement of surface course asphalt. This must be completed prior to assumption into the municipal system.

9.0 WATER DISTRIBUTION

9.1. General

Water mains, hydrants, appurtenances, and service connections shall be provided to serve the whole of the development and shall be compatible with adjacent developments.

- The proposed water supply and distribution system shall be submitted to the Municipality for approval and final acceptance by the Municipality.
- The design and installation of the system must comply with MECP F-6-1 Procedures to Govern Separation of Sewers and Watermains.
- The Geotechnical Report shall comment on the requirement for corrosion resistance measures.
- Air release valves must be considered at high points of all watermains and where possible, installed together with valves in valve chambers. Drains must be considered at low points of all watermains and where possible, installed together with valves in valve chambers.
- All private water distribution system piping (i.e., condominium) shall require the installation of a backflow preventer and flow meter at the property boundary using an approved prefabricated combined backflow preventer and flow meter chamber as per Municipal Materials List or as pre-approved by the Municipality.
- No connection to the existing water distribution system or works that require the operation of control valves or hydrants may proceed without a certified operator employed by the Municipality on site.
- All connections to municipal mains must be undertaken in the presence of Municipal staff and/or the Municipal Engineer. All active main valves must be operated by certified municipal staff. A minimum of 48-hour notice is required to be given to the Environmental Services Department when scheduling these works.
- All water system materials that may be in contact with potable water must be CSA and NSF Certified and AWWA Compliant. A letter from the Design Engineer shall be provided at the end of the project confirming that all materials used are in compliance with the above standards.

9.2. Design

All watermain design shall conform with the requirements of the MECP Design Guidelines for Drinking Water. All design reports shall include the basis of design including either linear watermain design calculations based on a known fire hydrant pressure test, or a calibrated computer model as provided by the Municipality or modelled by a Third Party designated by the Municipality at the full cost of the proponent where the proposed water system connects to the existing distribution system in more than one location.,

9.3. Water System Components

9.3.1. Watermains

All fittings, pipes and appurtenances shall be CSA Certified, NSF, and AWWA Compliant.

- Watermain pipe shall be ductile iron conforming to OPSS 441.05.02, gasketed PVC (DR18) conforming to OPSS 441.05.04 and AWWA C900, or other material as approved by the Municipality,
- Joints and Fittings shall be grey or ductile iron, cement lined mechanical joint fittings and retainer gland rings up to 300 mm in diameter.
- Greater than 300mm or pipe connections to existing systems shall be addressed on a case-by-case basis.

All valves, fittings and mechanical restraints are to be installed complete with corrosion protection coatings as per the Materials List.

Extra fittings (tees, elbows, flushing points, hydrants, valves) shall be installed at any point on water mains as requested by the Municipality.

Pipes shall be bedded in accordance with OPSD 802.030 (Rigid Pipe) and OPSD 802.010 (Flexible Pipe).

The nominal cover on the watermains, hydrant branches and services shall be 1.8 m at all points.

Cathodic protection is required on all metal pipes and fittings, and as confirmed by the Geotechnical Report. Minimum protection is to be provided by the installation of S-12 zinc anodes at 30 m spacing and S-12 zinc anodes placed on each water service. Zinc anodes are to be installed in accordance with OPSS 442 and in accordance with the manufacturer's instructions.

Watermains shall be adequately sized to give fire protection. The minimum size shall be 150 mm diameter for residential areas and 200 mm diameter where the abutting properties are planned to be used for industrial or commercial purposes. The Municipality may also require a larger main on a development street for circulation or other reasons.

All watermains shall be tested, swabbed, flushed, and disinfected in accordance with current OPSS 441 specifications and Meaford QMS SOG - 14A - Watermain Disinfection Procedure (Municipal Projects) or Meaford QMS - 14B - Watermain Disinfection Procedure (New Developments). All sections of watermain shall be wet swabbed using a minimum of three (3) foam swabs in each section of watermain.

The Developer's Engineer shall ensure that a watermain swabbing plan is approved by the Municipality. The plan shall ensure that the watermain is fully charged with water prior to the commencement of swabbing. A representative of the Municipality shall be present to witness and document the installation and retrieval of all swabs. The swabs shall be marked and/or numbered to demonstrate that all swabs have been discharged and retrieved at an approved outlet location.

The Developer shall arrange the watermain test (pressure, bacteriological, and tracer continuity testing) and shall inform the Municipality when a section is on test and ready for inspection. Any sections failing the test shall be repaired and retested at the Developer's expense.

9.3.2. Tracer Wire

PVC and ductile iron pipe installations shall include a tracer wire as per the Materials List. Tracer wire colour shall be blue for all watermain construction. The installation of the tracer

wire shall provide for a connection at the flange of all fire hydrant barrels as noted on Municipal Standard STD DWG W.1 - Hydrant and Valve Detail. Corrosion-proof, waterproof connections must be provided at all tracer wire connection locations as per the Materials List.

Tracer wire continuity of current must be tested by the installer and verified by the representative for the Municipality between all connection locations. Tracer wire continuity of current must be tested and certified by Municipal staff prior to acceptance and placement of base course asphalt.

9.3.3. Valves

Gate valves shall be installed at the intersection of street lines in sufficient numbers to allow the isolation of each section of watermain between intersections. The Municipality may require an extra valve in the main at an intermediate point, maximum 300 m between valves.

All valves at points of termination of a stage of construction shall be mechanically restrained for two additional lengths of watermain pipe beyond the gate valve. Watermain pipe termination shall be plugged and braced complete with a minimum 25 mm blow off (self-draining) as per OPSD 1104.030.

Where watermain valves are located within the travelled road surfaces, the top of the valve box shall be set 50 mm below grade for gravel surfaces and flush with the paved road surface and a 0.5 m asphalt apron provided if located in gravel shoulders.

Gate valves shall be resilient seat "open left", complete with mechanical joint ends and sliding type valve boxes with 125 mm diameter lids marked WATER. Valves shall be joined to the pipeline with anchor tees, tie-back rods or by using mechanical joint retainer gland rings.

9.3.4. Backflow Preventers

Backflow protection must be provided in accordance with the OBC and applicable Provincial Regulations.

9.3.5. Hydrants

Hydrants shall be as per the Materials List, with mechanical joint ends. Hydrants shall be provided with two hose connections plus a pumper nozzle complete with Storz type fitting. Branch mains to hydrants shall be 150 mm diameter. Valves shall be resilient seated, left-hand opening, complete with slide type valve boxes with 125 mm diameter lids marked WATER. Valves that are connected to tees require mechanical joint retainer gland rings in some circumstances.

Hydrant Locations shall be as follows:

- Hydrants shall be spaced at a maximum distance of:
 - 150 m in residential areas
 - 100 m in commercial, industrial, or high-density residential areas.
- A hydrant shall be placed at the end of every cul-de-sac and dead-end street.
- Wherever possible, hydrants shall be located at corners within 3 m of street line

intersections.

- All hydrants shall normally be for a 2 depth of trench with provision for extension at the surface for adjustment to street line grades.
- Hydrants shall be bedded in 19 mm screened crushed stone and Mechanically restrained back to the main tee plus two pipes in each direction.
- Tees and bends shall also be braced with retainer gland rings.
- Hydrant flanges shall be set 75 mm to 100 mm above finished grade.
- Hydrant flex stake markers shall be installed on all hydrants.
- Hydrant markers in urban areas, consisting of a fibreglass type marker that are designed to fit over the hose nozzle and are held in place with the nozzle cap shall be installed at each hydrant.

Hydrants shall be installed as per the Municipality of Meaford - Hydrant and Valve Detail Standard STD DWG W.1.

9.3.6. Residential Services

- Each residential unit shall have a separate 25 mm minimum diameter PE-160 with tracer wire or Type "K" copper water service or approved equivalent material as approved by the Municipality.
- The water service line must be a continuous length with **no** couplings.
- Water service fittings shall be as per the Materials List or pre-approved equal.
- Meters: 19 mm x 16 mm water meter and backflow preventer to be obtained from the Municipality at Developer's cost.
- Water service installations shall be at 90 degrees to the water main (i.e., perpendicular to the front of the house and street).
- Service connections to water mains shall be made by direct tapping of ductile iron watermain or with approved CSA/AWWA certified broad-band saddles on PVC.
- No water service connection shall exceed 20 m in length without municipal approval.
- All saddles and main stops are to be installed complete with Denso paste, Denso mastic and Denso tape or approved equal.
- A curb stop and extension service box and main stop must be installed on each service using compression joint fittings.
- Curb stops must not be self-draining. Curb stop installation must include a 100 mm brick under the curb stop with a 2.5 m long, 19 mm diameter tail piece extending to the surface.
- A 12 lb. Zinc anode shall be installed on each water service at the curb stop using a clamp or as stipulated in the Geotechnical Report.
- Curb stops shall be located on the property line and shall be located 1.5 m o/s right of centreline of lot and must be 1.0 m offset from any existing or proposed driveway.

- Water services shall **not** be installed under a driveway or walkway. In the event a water service must cross under a driveway or walkway, the continuous length of service must be sleeved inside a minimum 75 mm diameter conduit either PVC SDR 35 or SCH 40 plastic pipe.
- Water services on private property shall be installed on the property to be serviced and in **no** case shall cross over into an adjacent property line or pass through other private property.
- Water services must **not** occupy the same trench as another utility and must be separated by a minimum 1.0 m distance when paralleling other utilities.
- Water services shall **not** pass through any portion of a septic system.
- The Developer will purchase, from the Municipality, a water meter with radio frequency readout, check valve and installation meter tails for each service as per current Municipal By-law #134-2006 that may be updated from time to time.
- A pressure reducing valve is required where the water pressure at the meter exceeds 552 kPa (80 psi).

The Developer must install the water meter, check valve, pressure reducing valve, pipes and other appliances in an easily accessible and safe location as approved by the Municipality. The Developer must provide a letter of certification from a licensed installer noting conformance with the Engineering Standards together with an installation photo for municipal records.

If the water service on private property is greater than 30 m, a water meter pit is required in accordance with Std. Dwg. No. W.7. The water meter pit location must be approved by the Municipality. The Developer is responsible for the protection of the water meter and pit and must take measures to prevent the water meter and service installation from freezing.

9.3.7. Industrial/Commercial/Institutional Services

The standard size for potable industrial/commercial/institutional water services is 38 mm dia. unless otherwise demonstrated by the Developer's engineer.

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

- Provide a common individual service to property lines.
- If on-site fire protection is required, the minimum pipe size shall be 150 mm dia. with calculations to be provided to the Municipality to demonstrate pipe sizing needs on site.
- 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. This must be done within the building mechanical room or a dedicated in-ground chamber, all as per NFPA 13: Standard for the Installation of Sprinkler Systems.
- At the point of separation, both lines must have independent valves.
- Protection from contamination must conform to Section 7.6.2 of the OBC with

check valves and/or backflow preventers, approved by the Municipality based on a risk assessment to be determined by the Municipality.

- The face of an industrial/commercial/institutional building is to be within 90 m of street hydrant.
- The face of all portable industrial/commercial/institutional units must be within 90 m of street hydrant.
- Siamese connections must be within 45 m of a site hydrant complete with bollard protection.
- Domestic line must make provision for a water meter complete with a bypass. The private works Owner shall purchase the industrial/commercial/institutional meters, check valve, pressure reducing valves and backflow preventer from a supplier approved by the Municipality as per current By-law #134-2006 that may be updated from time to time.
- The private works Owner must install One (1) common water meter, check valve, pressure reducing valve for the entire building. All pipes and other appliances shall be installed at 1.2 m above the floor in an easily accessible and safe location as approved by the Municipality.
- PVC and PE pipe must be installed with tracer wire. A continuity test must be undertaken and certified by Municipal staff prior to acceptance.
- All site watermains and services more than 100 mm must be flushed, chlorinated and pressure tested in accordance with OPSS. All building mains must be installed and tested in accordance with the OBC. All tests must be certified by the Municipality.
- All connections to existing municipal supply lines must be inspected by a representative of the Municipality prior to backfilling operations.
- The Developer is responsible to have any existing or new reduced pressure backflow preventer, double check valve or pressure vacuum breaker inspected and tested upon installation, when cleaned, repaired, or overhauled, when relocated and annually tested thereafter for industrial, commercial, and institutional by an individual certified as a backflow preventer tester in accordance with the OBC.

9.3.8. Developer Maintenance Requirements

The internal water distribution system must be maintained by the Developer until assumption of all services in the subdivision. A policy and procedure manual shall be completed and in place between the Municipality and the Developer to respond to, and act on, any water leaks on private works. This agreement shall be reviewed with the Municipality and Developer prior to commissioning.

The Developer or Owner and the Municipality will enter into an agreement for annual backflow inspections, regular water sampling and maintenance flushing of the internal water distribution systems of industrial/commercial/institutional sites by Municipal operators to be completed, as necessary.

Water sampling stations, where deemed necessary by the Municipality, shall be installed in accordance with Standard Drawing STD-W.5.

9.3.9. Water System Close-out Testing and Documentation

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

Upon completion of the work and prior to issuance of Building Permits, Water Service Record Sheets, (one for each lot), shall be prepared by the Developer's Engineer and turned over to the Municipality. The sheets shall show clearly:

- registered lot number and street lines and lot number.
- ties from the end of the service to the lot lines
- north arrow
- type, diameter, and geodetic invert at the end of each service
- any other pertinent information

All water valves, curb stops and hydrants must be inspected for accessibility and operation prior to Preliminary Acceptance (Basic Services) and prior to assumption into the Municipal system.

10.0 SANITARY SEWER SYSTEM

10.1. General

Sanitary sewers and service connections to the property line shall be provided to serve the whole of the development and shall be compatible with adjacent developments.

- Sanitary sewer and service connections to the street line shall be installed prior to road base construction.
- Final drawings of the system shall be submitted in accordance with the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) for the Municipality.
- Sanitary sewers shall be connected to the Municipal sanitary sewer system at locations approved by the Municipality.
- The design and installation of the system must comply with MECP F-6-1 Procedures to Govern Separation of Sewers and Watermains.
- Rainwater leaders, house perimeter tile drains, air conditioner drains, or sump pump discharge pipes shall not be connected to the sanitary sewer system.
- The Municipality may require a larger sanitary sewer size on parts of the development than required for the development alone to service upstream areas.
- If a pumping station is required and approved by the Municipality, it shall be designed in accordance with the MECP guidelines with standby power and to the satisfaction of the Municipality.

10.2. Design

All sanitary sewer design shall conform with the requirements of the MECP Design Guidelines for Sewage Works. All design reports shall include the basis of design including design sheet and assessment of downstream sanitary sewers.

10.3. Materials

- All materials shall be CSA Certified.
- Mainline sanitary sewers shall be PVC SDR 35 with rubber gasket connections and of minimum size 200 mm diameter.
- Service connections shall be PVC SDR 28 with rubber gasket connections and shall be 150 mm minimum diameter for all single or duplex residential units. Larger residential units shall be sized on a case-by-case basis if a service more than 150mm diameter is needed. Connections for multiple dwellings and commercial or industrial premises shall be of a type and size accepted by the Municipality.

10.4. Installation

10.4.1. Piping

Sanitary sewer construction and testing shall conform to the requirements of the OPSS and OPSD's for sanitary sewer construction per OPSS 410.

Pipes shall be embedded in accordance with OPSD 802.010. Main sanitary sewers and

service connections across roadways shall be backfilled entirely with approved granular materials, thoroughly compacted in layers. Filter wrapped clear stone may be used where the specified trench bedding is deemed unsuitable due to trench conditions.

10.4.2. Services

Shop manufactured “Tee” connections shall be used for service connections on 200 mm and 250 mm diameter sanitary sewers. Saddles are not permitted on 200 mm and 250 mm diameter sanitary sewers. No service connections shall exceed 20 m in length without special approval of the Municipality.

The sanitary lateral shall be located at the centre of the lot at a minimum depth of 500 mm below the water service and at a maximum depth of 2.5 m below the finished grade at the property line. The nominal cover on the lateral shall be a minimum of 1.8 m at all points.

The sanitary lateral shall be minimum 150 mm diameter PVC DR28 pipe. The lateral shall be terminated at the property line with a 150x100 reducer, 300 mm length of 100 mm diameter pipe capped with a waterproofed end fitting. The location is to be marked with a 2x4 which extends above finished boulevard grade as per Municipality of Meaford – Sewer Service Connection Detail – Standard Drawing STD-SA.1.

In addition, a 150x150x100 – 90° tee shall be installed complete with a 100 mm – PVC riser extended to 600 mm above rough lot grade, complete with a waterproof end fitting cap. Upon inspection by the Municipality, these fittings will be adjusted by the builder to within 150 mm below finished boulevard grade adjacent to property line complete with a detectable metal cap.

Sanitary sewer services on private property shall be installed on the property to be serviced only.

The Developer shall install a backwater valve in the sanitary sewer service line for new homes. The backwater valve shall be in an easily accessible location approved by the Municipality. The Municipality may require private residents to install a backwater valve as part of a Municipal Capital Works Project.

10.4.3. Maintenance Holes

Maintenance holes shall be provided at all changes in direction of the sanitary sewer and at all street intersections, but no further apart than 120 m.

Maintenance holes shall be precast concrete, conforming to OPSD 701.010 and shall generally be 1200 mm diameter. Larger sizes may be required depending on the size of the sanitary sewer. The selection of manufacturer of precast concrete maintenance holes will be subject to the approval of the Municipality if not provided on the Material List.

Maintenance hole steps shall be as per OPSD 405.010 hollow rungs installed at 300 mm spacing with a maximum 450 mm from the top of grate to the first step.

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 150 mm and a maximum of 300 mm of “Moduloc” adjustment rings.

Connections to maintenance holes shall enter the maintenance hole no higher than 600 mm above the lowest invert except as otherwise approved by the Municipality.

Waterproof membrane or pre-approved waterproofing mastic shall be applied completely around the exterior of all riser section joints as per Standard Drawing STD-SA.2.

Maintenance holes must be initially installed such that frame and grate is flush with base course asphalt and raised to be flush with finished grade prior to the placement of top course asphalt. Precast concrete adjustment units shall be installed per OPSS 704.010. Lift rings are unacceptable.

End of system maintenance holes shall be located within 15 m of any fire hydrant that is positioned at the limit of the water distribution system for maintenance flushing purposes.

10.4.4. Sanitary System Close-out Testing and Documentation

All sanitary sewers and maintenance holes must be inspected and flushed prior to assumption into the municipal system.

Sanitary sewers shall be cleaned, flushed, inspected by an approved video camera testing company, and tested for soundness and deflection in accordance with the current OPSS 410 specifications prior to the issuance of the Certificate of Substantial Completion “Basic Services”.

The complete sanitary system must be cleaned, flushed, and inspected by an approved CCTV video camera testing company in accordance with OPSS 409.

The Municipality shall be provided with a copy of the inspection report and video and approve the quality of the works prior to the issuance of the Certificate of Substantial Completion “Basic Services” and within one month prior to the placement of surface course asphalt.

Upon completion of the work, and prior to the issuance of Building Permits, Sanitary Sewer Record Sheets shall be provided on a standard service record sheet showing the location, depth, and material of the sanitary service location.

11.0 UTILITIES

11.1. General

All locations must be established and resolved by the Developer's Engineer in conjunction with the utility companies and following the locations shown on the typical cross-section.

A Composite Utility Plan is required for review and acceptance to ensure there are no conflicts with drainage or other design components.

Drawings for Municipal Consent (MC) must not be submitted to the Municipality until after the Developer and the Developer's Consultant have stamped and accepted (i.e., signed off) on the MC submission drawings.

Utility crossings for new roads shall be placed prior to placement of granular road base materials. Utility crossings on existing roads shall not be carried out until approved by the Municipality. Utility crossings for existing roads shall have the asphalt surface saw-cut and removed for the width of the trench plus a minimum of 0.3 m out from each side of the trench walls.

11.2. Communication/Telecommunication Facilities

The Developer must confirm that sufficient wire-line communication/telecommunication infrastructure is available for the proposed development. If such infrastructure is not available, the Developer may be required to pay for the connection to and/or extension of the existing communication/telecommunication infrastructure. If the Developer elects not to pay for such connection to and/or extension of the existing infrastructure, the Developer shall demonstrate to the Municipality that sufficient alternative facilities are available within the proposed development to enable, at a minimum, the effective delivery of services for emergency management services (i.e., 911 Emergency Services).

Telephone/Internet/Cable services, if available, shall be underground and shall be installed by Municipal approved supplier or their approved contractor. The Developer must bear the cost of any surcharges for underground installation and must grant the Telecommunications provider any easement for their services.

11.3. Hydro

Hydro service shall be underground and shall be installed by Hydro One or an approved Contractor. The Developer must bear the cost of any surcharges for underground installation made by Hydro One and must grant any necessary easements for their services. All transformers shall be pad mounted. For subdivisions situated within areas classified as "infilling" by the Municipality, the Hydro services may, at the option of the Developer, be overhead.

11.4. Gas

Gas service, if available, shall be underground on both sides of streets and shall be installed by the Gas Company or an approved Contractor. The Developer must bear the cost of any surcharges for underground installation made by the Gas Company and must grant the Gas Company any necessary easements for their services.

11.5. LIGHTING

11.5.1. General

All new development and municipal works projects within commercial and residential areas shall include lighting within municipal road allowances that:

- Are only to be on when needed,
- Only light the area that needs it,
- Is no brighter than necessary,
- Minimizes blue light emissions (<3000 Kelvins colour temperature), and
- Eliminates upward-directed light.

Lighting shall be designed in accordance with the Illuminating Engineering Society (IES) RP-8-14 “Recommended Practice for Roadway Lighting,” an ANSI approved standard.

11.5.2. Street Lighting

Street lighting shall be provided along roads where pedestrians and cyclists are expected – particularly at intersection crossings. Lighting levels shall correspond with expected activity in commercial and residential areas as per IES RP-8-14 “Recommended Practice for Roadway Lighting.”

11.5.3. Roadway Lighting

Roadway lighting shall be provided along roads that are not anticipated to have significant pedestrian activity. This includes limited access highways and freeways that are not generally within the Municipality’s jurisdiction. The lighting of these facilities shall be coordinated with the relevant jurisdictions in consultation with the Municipality.

11.5.4. Desired Illuminance Levels

Lighting levels for streets shall follow IES RP-8-14 “Recommended Practice for Roadway Lighting” tables for:

- Lighting Design Criteria for Streets,
- Recommendation Values for High Pedestrian Conflict Areas,
- Recommendation Values for Medium Pedestrian Conflict Areas,
- Recommendation Values for Low Pedestrian Conflict Areas,
- Illumination for intersections

Illuminance levels shall be achieved using a combination of selected light pole heights and luminaire characteristic.

11.5.5. Luminaires, Light Poles, and Arms

Specific luminaires, light poles, and a single decorative mast arm have been selected to support a uniform municipal character and be cost effective to operate, maintain and replace if necessary. A combination of pole height with corresponding luminaire characteristics shall be used to determine pole spacing and locations to achieve IES RP-8-14 “Recommended Practice for Roadway Lighting” illuminance levels.

For consistency, the colour of all metal components shall be specified using the RAL reference number, rather than a factory finish, as indicated.

Project designers may choose from the following.

11.5.6. Luminaire Choices

Project designers may choose from the following:

Select post-top “acorn” types:

- King Luminaire K54 Cleveland Jr. – LED 3000K Colour Temperature with #6 Finial and K24 Capital – Colour RAL 9005 Jet Black, or
- King Luminaire K595 Aristocrat – LED 3000K Colour Temperature with #1 Finial and K30 Capital – Colour RAL 9005 Jet Black

Select mast arm and “pendant” types:

- King Luminaire K803 Solitaire Sr. – LED Pendant 3000K Colour Temperature with KA30-S-1-6’ Scroll Arm without Decorative Scroll – Colour RAL 9005 Jet Black, or
- King Luminaire 820 Midland Sr. – LED 3000K Colour Temperature with KA 30 Scroll Arm without Decorative Scroll – Colour RAL 9005 Jet Black

Luminaire type and height should be consistent throughout a development and may be dictated by the Municipality to meet village or hamlet consistency.

11.5.7. Light Pole Choices

Project designers may choose from the following:

- Stresscrete Belmont Series KBH18 Highwayman 18, E80 Etched Vintage Brown Finish, Direct Burial, DR Duplex Receptacle.
- Stresscrete Belmont Series KBH25 Highwayman 25, E80 Etched Vintage Brown Finish, KBH Direct Burial, DR Duplex Receptacle.
- Stresscrete Round Tapered Pole E - Direct Embedment, **(select pole length based on illuminance required and luminaire characteristics)**, Class B Prestressed Round Cross Section, Electrical Ground, Mold Finish.

Each light shall be controlled by a fully accessible twist-lock ‘dusk to dawn’ photo-electric controller and be fused. Power feed shall be completely underground and metered.

The light shall generally be placed on the outside of curved roads. Street lighting standards are to be installed no closer than 3 m (10') to pad mount transformers.

Where overhead hydro has been permitted, the hydro poles, if located on the road allowances, may be used to carry the street lighting.

Power pedestals are required for all locations of streetlights as per Hydro One requirements.

The proposed street lighting layout shall be indicated on the Site Servicing Plan. The type of pole, height, luminaire details and spacing shall be as set out above and must be submitted to the Municipality for acceptance prior to commencement of any installation.

Electrical Safety Authority approval is required for all street light systems.

12.0 STREET AND TRAFFIC SIGNAGE

12.1. General

- A plan of all street and traffic sign locations shall be submitted to the Municipality for acceptance.
- Where applicable, street name signs and posts shall conform to Municipal 911 standards.
- Proposed street names shall be subject to the approval of the Municipality and adopted by Municipal By-law.

12.2. Traffic Signs

Traffic signs shall be provided and installed by the Municipality at the cost of the Developer. The signs are to be of a standard type approved by the MTO and shall be located as required by the Municipality following the passing of a by-law for their installation.

The shape, colour, height, sheeting and location of traffic signs shall be in accordance with the 7 (OTM), Book 5 – Regulatory Signs (March 2000) published by the MTO. All regulatory signs shall be manufactured using “High Intensity” sheeting conforming to ASTM D4956-95 Type III or Type IV material.

Traffic signs are typically to be in the intersection as follows:

- 2.0 m offset from edge of asphalt of approach road.
- 5.0 m offset from edge of asphalt of through road.

12.3. Street Name Signs

The street signs will be provided and installed by the Municipality at the Developer’s expense. Street Name Blades are to be manufactured with extruded aluminum, 10 centimeters in width, with white letters on a green background.

At each intersection there shall be erected a double unit street name sign. The signs shall be typically located in the intersection as follows:

- 3.0 m offset from edge of asphalt of approach road,
- 5.0 m offset from edge of asphalt of through road.

In boulevard, on opposite side of road from traffic sign (i.e., Stop sign).

Proposed street names shall follow the Street, Park and Municipal Facility Naming Policy and be subject to the approval of the Municipality and adopted by Municipal By-Law.

12.4. Traffic and Street Signposts

Signposts for street name signs and traffic signs are to be “U-Flange” galvanized metal posts 3.75 m long, embedded 1.2 m in the ground.

13.0 CANADA POST MAILBOXES

Mailbox locations shall conform to the requirements of the current version of the Canada Post Delivery Planning Standards Manual for Builders and Developers.

- The location of the community mailbox area is to be indicated on the General Service Plan. The area shall be beyond the edge of shoulder or back of curb with provision for appropriately sized structural concrete bases that conform to Canada Post's specifications including any required walkways across the boulevard and any curb cuts to provide barrier free access to the permanent community mailbox locations.
- Where the community mailbox area is provided on a semi-urban roadway, the area will consist of 50 mm HL3 asphalt on a granular base. The asphalt shall extend from the edge of the paved portion of the road to the back of the mailboxes.
- In semi-urban and rural designated areas where individual mailboxes are required, the mailbox height and offset must be installed as per Canada Post regulations.

APPENDIX A – CERTIFICATE OF LOT GRADING

SUBDIVISION NAME:

REGISTERED PLAN
NO.:

LOT NO.:

HOUSE NO. / STREET

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

Comments:

Certified:

Date:

Company:

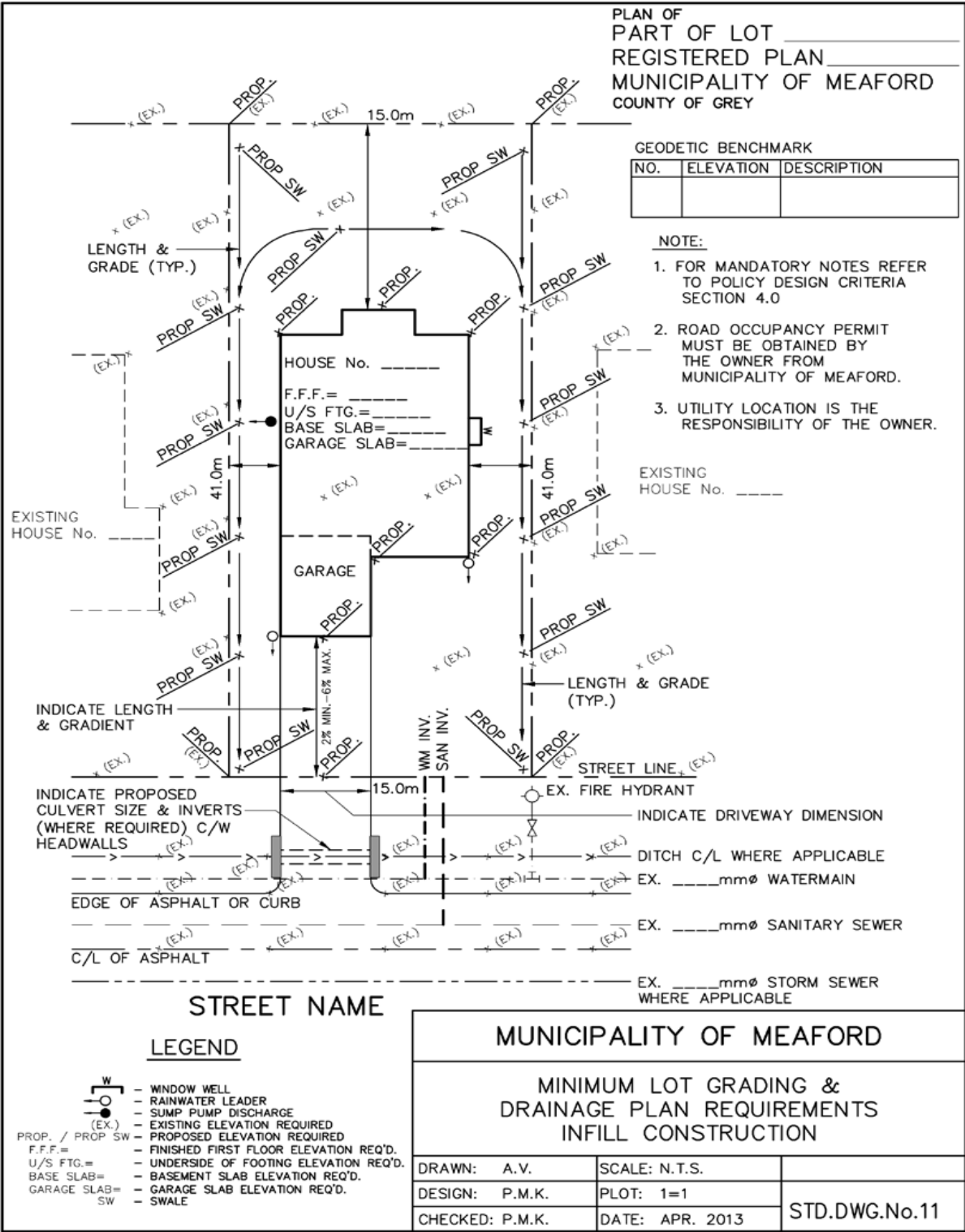
CC: File No.
 Building Department
 Transportation & Fleet Services
 Developer

LOT GRADING CERTIFICATION CHECK LIST

1.	Lot grading plan is attached.	Yes	No
2.	Grading design amendments have received prior municipal approval.	Yes	No
3.	A pre-sod grade check was determined to be satisfactory.	Yes	No
4.	Sod has been placed.		
	• Front yard and boulevard	Yes	No
	• Side yards	Yes	No
	• Rear yard	Yes	No
5.	Final grades have been checked and are in general compliance with lot grading plan.		
	• Apron/Garage Floor	Yes	No
	• Lot Corners	Yes	No
	• Side yards	Yes	No
	• Top of Foundation Wall	Yes	No
	• Underside of Footing	Yes	No
6.	Side yard swales are well defined.	Yes	No
7.	Rear yard swale is well defined.	Yes	No
8.	All rear and side yard swales are minimum 1% gradient, or else subdrain has been installed and verified as per the lot grading plan.	Yes	No
9.	Splash pads have been placed at all downspouts.	Yes	No
10.	Finish grades are approx. 150 mm below brick/siding.	Yes	No
11.	There are no areas of settlement at or adjacent to foundation walls.	Yes	No
12.	Grading encroachment on adjacent lots has been reinstated to the satisfaction of the adjacent lot owner(s).	Yes	No

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

APPENDIX B – EXAMPLE OF LOT GRADING PLAN



APPENDIX C – MUNICIPAL SERVICING TESTING REQUIREMENTS

WATERMAIN

- Swabbing (1*)
- Hydrostatic Pressure Test (1*)
- Chlorination / Chlorine Residual (1*)
- Flushing to Municipal Levels (CI range to be verified with Operations Department) (1*)
- Bacteriological Sampling (24 and 48 hr.) (1*)
- Curb Stop Operation – by Developer/ Municipality's Engineer (1* & 3*)
- Valve Operation – by Operations Department (1*)
- Hydrant Operation – by Operations Department (1*)
- Continuity (Tracer Wire) Test – by Operations Department (1*)

SANITARY SEWER

- Deflection (Mandrel) Test (1*)
- Leakage (Infiltration/Exfiltration) Test (1*)
- Visual MH Inspection (1*)
- Flushing (1*)
- CCTV Inspection (1* & 3*)

STORM SEWER

- Visual – CB, RLCB, CBMH and MH Inspection (1*)
- SWM Facility Inspection (1* & 3*)
- Flushing (1*)
- CCTV Inspection (1* & 3*)

ROADWORKS

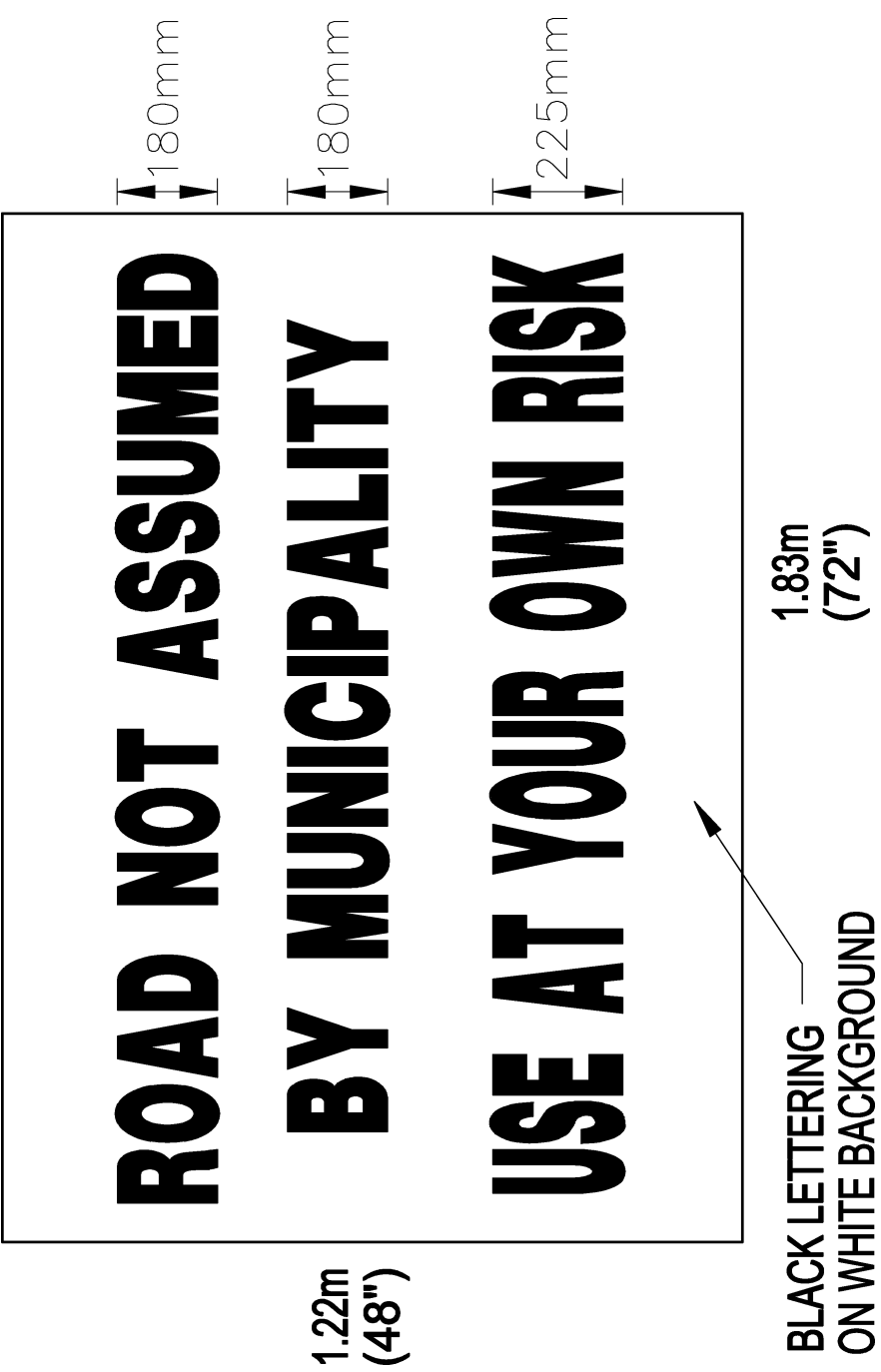
- Sub-grade (Proof roll) (1*)
- Granules (Sieve Analysis, Compaction) (1*)
- Curb & Gutter (Compaction and Concrete Strength – 1*; Visual – 2*)
- Base Course Asphalt (Compaction, Visual) (1*)
- Surface Course Asphalt (Compaction, Visual) (2*)
- Sidewalk (Visual) (2*)
- Street signs (Visual) (2*)
- Streetlight (Visual) (2*)

NOTE: 1* - Requirement to be completed prior to issuance of the Certificate of Substantial Completion (Basic Services)

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

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

APPENDIX D – ROAD NOT ASSUMED SIGN

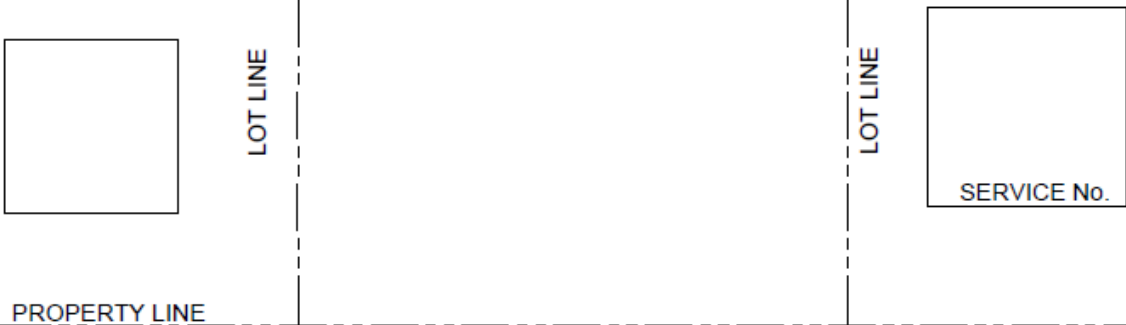


APPENDIX E – WATER AND SEWER SERVICE RECORD

WATER & SEWER SERVICE RECORD

MUNICIPALITY OF MEAFORD: _____ STREET No: _____
PROJECT NAME: _____ CONTRACT No: _____

1. AS CONSTRUCTED SERVICE LOCATION


PROPERTY LINE
CENTRE LINE OF ROAD

2. TYPE OF PIPE & DIAMETER

MUNICIPAL PROPERTY	PRIVATE PROPERTY
STORM _____	STORM _____
WATER _____	WATER _____
SANITARY _____	SANITARY _____
INVERT ELEV. _____ STORM / WATER / SAN	INVERT ELEV. _____ STORM / WATER / SAN
DEPTH TO INVERT AT END: STORM / WATER / SAN	DEPTH TO INVERT AT END: STORM / WATER / SAN

3. GPS COORDINATES AND PHOTOS

STORM _____ NORTHING / EASTING	WATER _____ NORTHING / EASTING
SANITARY _____ NORTHING / EASTING	PHOTO No. _____

4. REMARKS: _____

5. TO THE BEST OF OUR KNOWLEDGE, THE DIMENSIONS SHOWN IN 1. ABOVE ARE CORRECT.

CONSULTANT _____ COMPILED BY _____ DATE (YY/MM/DD) _____

APPENDIX F – SITE PLAN CHECKLIST

Municipality of Meaford Site Plan Control Review Checklist

Name of Site:

Address of Site:

File #:

Date:

Reviewed by:

1. General:

All plans should 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 benchmarks, 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 block).

Provide current traffic volumes (AADT), % trucks, and anticipated volumes. Review sight lines, location and size of existing road, billboard, and advertising signs

Review needs to upgrade adjacent street for turn lanes, ramps, acceleration lanes, traffic signs, and traffic lights.

2. Site Plan:

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

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 widening, curbs, sidewalks

1-foot reserves, rights-of-way, easements

Existing natural features – vegetation, watercourses, wetlands, steep slopes, etc.

Abutting land uses, structures, and features.

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

Location and dimensions of all proposed buildings and structures (Note: please refer to the Municipal Zoning By-law for specific zone provisions.)

Location and dimensions of all proposed access/egress locations relative to intersections.

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, handicapped parking (Note: Please refer to the Municipality's Zoning By-law for specific 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 Municipality's Sign By-law).

Location and direction of exterior lighting

Location and type of garbage enclosure

Location and type of sight and noise buffers to neighbouring properties

Location and access for debris, storage of materials and supplies.

The following development statistics in chart form should 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 (1) covered by buildings (lot coverage), (2) paved and (3) landscaped.

The following landscape information should 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 dashed line)

Location, type, size, spacing and number of all 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, 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 5 ft. high, along the lot lines adjacent to existing residential uses,
- Decorative planting schemes along the street frontages,
- Shade tree planting adjacent to parking areas,
- Shrub massing to soften fence lines and to add relief to asphalt surfacing,
- Sufficient area for snow storage.

3. Site Servicing Plan:

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

Existing and proposed contours and/or spot elevations, benchmarks, and elevations on site (at intervals no greater than 15.0 m over the entire site) and on abutting roads and properties.

Existing and proposed grades and ground floor elevations – Note:

- Indicate the first-floor building elevations, together with underside of footings, basement floor and top of foundation wall
- Indicate proposed finished ground grades (use spot elevations) sufficient to show all surface drainage, including elevations and cross sections of ditches and swales,

Existing and proposed utilities and services on and adjacent to the site including:

- Telephone, natural gas, hydro, and cable TV
- Sanitary sewers, storm sewers, catch basins, waterlines, hydrants, ditches and swales, streetlights, driveway culvert, etc.
- Type, size, grades, class and C.S.A. standards for all pipes
- Location and size of any septic systems, tile beds, soak away pit, holding tanks, wells
- Location and size of meter rooms, transformers, vault valves, Siamese connections, etc.
- Top of grates and inverts elevations of all maintenance holes and catch basins.

Show existing and proposed roads, driveways, and curbs, including:

- Base design for entrance and parking area
- Type and thickness of the surfacing material

- Traffic circulation, traffic signs, curbing and line painting, width of entrance,
- Parking area requirement, length, width of parking locations, access, loading area, handicap parking – number and size,
- Snow storage area
- Proposed road widenings, daylight triangles, or any other related dedications or easements,

Storm water management, both quantity and quality, should be addressed, including:

- Existing drainage, proposed drainage, storm sewer/ditch sizing, detention/retention, storm sceptor, outlet,
- Erosion control, siltation control, building flood proofing,
- COA, Conservation Authority, M.O.E.
- Impact of SWM on downstream and possible municipal drains

4. Building Elevations:

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

Design concept of the building and the exterior building materials

Entrances, doors, arcades, any recesses, projections, or special features

Finished grade, floor, and roof elevations.

APPENDIX G – STANDARD DRAWINGS

OPSD's shall apply together with the attached Municipality of Meaford Standard Drawings:

Drawing Number	Drawing Title
STD DWG G.1	General Notes
STD DWG C.1	Stone Mud Mat Detail
STD DWG C.2	Minimum Lot Grading & Drainage Plan Requirements – Infill Construction
STD DWG R.1	20 m R.O.W. Urban Street – No Parking and Sidewalks Both Sides
STD DWG R.2	20 m R.O.W. Urban Street – No Parking and Sidewalk on One Side
STD DWG R.3	20 m R.O.W. Urban Street – Yield Parking and Sidewalks Both Sides
STD DWG R.4	20 m R.O.W. Urban Street – Yield Parking and Sidewalk on One Side
STD DWG R.5	20 m R.O.W. Urban Main Street – No Parking and Sidewalks Both Sides
STD DWG R.6	20 m R.O.W. Hamlet Street Without Parking
STD DWG R.7	20 m R.O.W. Hamlet Street with Informal Parking
STD DWG R.8	20 m R.O.W. Rural Road
STD DWG R.9	Urban Cul-de-sac with Curb and Gutter
STD DWG R.10	Rural Cul-de-sac
STD DWG R.11	90° Crescent with Curb and Gutter – 8.0m Road
STD DWG R.12	90° Crescent with Curb and Gutter – 6.5m Road
STD DWG R.13	20m R.O.W. Standard 8.0m Road Turning Basin
STD DWG R.14	20m R.O.W. Standard 6.5m Road Turning Basin
STD DWG R.15	Removable Entry Post
STD DWG R.16	Walkway Cross-section
STD DWG W.1	Fire Hydrant and Valve
STD DWG W.2	Valve and Valve Box
STD DWG W.3	Water Sample Station
STD DWG SA.1	Sanitary Sewer Clean-out
STD DWG SA.2	Precast Maintenance Hole Municipal Specific Requirements)
STD DWG ST.1	Roof Leader/Sump Soak away Pit Detail
STD DWG ST.2	Storm Service Connection

GENERAL NOTES

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. HYDRO POLES TO BE SUPPORTED AND PROTECTED BY THE CONTRACTOR DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH UTILITIES WHICH MAY ALSO BE UNDER CONSTRUCTION.
5. EXISTING GAS MAIN TO BE PROTECTED IN ACCORDANCE WITH UNION GAS SPECIFICATIONS.
6. ALL EXISTING PAVED PRIVATE ENTRANCES TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE AND 150mm GRANULAR 'A' BASE TO LIMITS OF CONSTRUCTION.
7. ALL EXISTING GRAVEL OR GRASSED PRIVATE ENTRANCES TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE TO LIMITS OF CONSTRUCTION AND 50mm HL3 TO 1.0m BEHIND CURB.
8. ALL COMMERCIAL ENTRANCES TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE, 150mm GRANULAR 'A' BASE AND 150mm GRANULAR 'B' SUBBASE TO LIMITS OF CONSTRUCTION.
9. ALL BOULEVARDS AND DISTURBED AREAS TO HAVE 75mm TOPSOIL AND NURSERY SOD UNLESS OTHERWISE NOTED.
10. PAVED BOULEVARD AREAS TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE ASPHALT AND 150mm GRANULAR 'A' WHERE NOTED.
11. ACCESS TO BUSINESS AND RESIDENTIAL PROPERTIES MUST BE MAINTAINED AT ALL TIMES.
12. MUNICIPALITY OF MEAFORD WATER DEPARTMENT OFFICIALS TO BE PRESENT FOR THE OPERATION OF VALVES AND TESTING & DISINFECTION OF WATERMAIN.

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. 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 CONTRACT ADMINISTRATOR AND THE 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.

SANITARY SEWER:

1. ALL MATERIALS SHALL BE CSA CERTIFIED.
2. SANITARY SEWER TO BE SDR 35 PVC PIPE.
3. BEDDING AS PER OPSD-802.010 USING GRANULAR 'A'. USE SELECTED SITE MATERIAL FOR BACKFILL.
4. 125mmØ AND 150mmØ SANITARY SERVICE LATERALS TO BE SDR 28 PVC PIPE INSTALLED PER OPSD-1006.10. CLEANOUT TO BE INSTALLED AT ALL 150mmØ SERVICE CONNECTIONS.
5. LOT SERVICE LOCATIONS TO BE VERIFIED BY CONTRACTOR.
6. MAINTENANCE HOLES PER OPSD-701.010.
7. FRAMES AND COVERS PER OPSD-401.010 TYPE 'A'.
8. MAINTENANCE HOLE BENCHING PER OPSD-701.021 AND STEPS PER OPSD-405.020 CIRCULAR ALUMINUM.

NOTE:

THIS STANDARD IS PROJECT SPECIFIC ONLY - USE ONLY WITH MUNICIPAL APPROVAL

WATERMAIN:

1. ALL MATERIALS SHALL BE CSA CERTIFIED.
2. BEDDING AND BACKFILL IN ACCORDANCE WITH OPSS-701.
3. WATERMAIN TO BE DUCTILE IRON WITH PRESSURE CLASS 350 OR MECHANICAL JOINTS CONFORMING TO OPSS-701.05.03 OR PVC SDR18.
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.
5. CATHODIC PROTECTION (S-12 ZINC ANODES @ 30m SPACING) TO BE PROVIDED IN ACCORDANCE WITH OPSS-702.
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 BLOCKING AS PER OPSD-1103.010.
8. VALVES TO BE MUELLER "55" RESILIENT SEATED, OR APPROVED EQUAL, LEFT HAND OPENING COMPLETE WITH SLIDE TYPE VALVE BOXES 125mm DIA. WITH LIDS MARKED WATER.
9. WATER SERVICES TO BE TYPE 'K' COPPER COMPLETE WITH MAIN STOP; MAIN STOP (MUELLER H15008 OR EQUAL), 25mmØ CURB STOP (MUELLER MARK II ORISEAL), AND SERVICE BOXES (MUELLER A-726 OR CONCORD D-1) AS PER OPSD-1104.010.
10. REMOVE AND REPLACE EXISTING WATER SERVICE LATERALS UP TO AND INCLUDING CURB STOP. (AS REQUIRED)
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 CANADA VALVE "CENTURY" TYPE OR CLOW "PREMIER D-67-M" WITH MECHANICAL JOINT ENDS, WITH 2-50mm PORTS AND FACTORY INSTALLED STORZ FITTING AND AS PER OPSD-1105.010.

STORM SEWER:

1. ALL MATERIALS SHALL BE CSA CERTIFIED.
2. STORM SEWER SHALL BE CONCRETE ES OR CLASS III, OR PVC 320 KPa PIPE STIFFNESS.
3. CLASS 'B' BEDDING AS PER OPSD-802.030 (RIGID PIPE) OR BEDDING AS PER OPSD-802.010 (FLEXIBLE PIPE) USING GRANULAR 'A'. USE SELECT NATIVE MATERIAL FOR COVER MATERIAL.
4. CATCHBASINS & MAINTENANCE HOLES TO BE BACKFILLED & COMPACTED WITH SELECT NATIVE MATERIAL.
5. STEPS AS PER OPSD-405.020 SOLID CIRCULAR ALUMINUM.
6. CATCHBASIN LEADS; - 250mm DIA. SINGLE
- 300mm DIA. DOUBLE

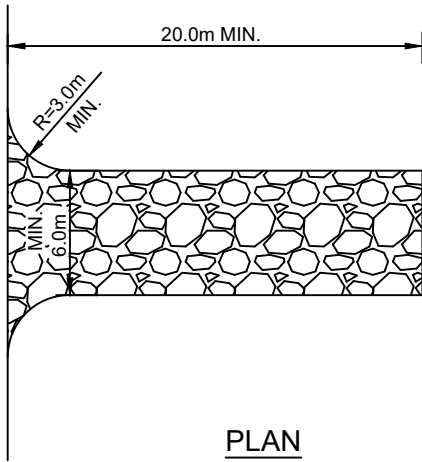
ROADS:

1. RURAL ENTRANCES ARE TO BE TO OPSD-301.10, 301.020 AND 301.030.
2. URBAN ENTRANCES ARE TO BE TO OPSD-350.10 AND 351.010.

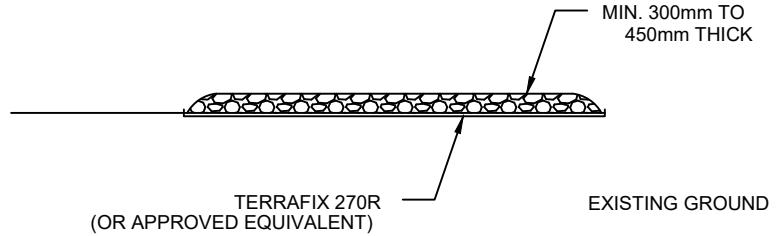
DETAIL

STONE MUD MAT

EXISTING PAVEMENT



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.
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.



- | | | |
|-----------------|---|---|
| | W | ._WINDOW WELL |
| | ○ | ._RAINWATER LEADER |
| ← | ● | ._SUMP PUMP DISCHARGE |
| (EX.) | | ._EXISTING ELEVATION REQUIRED |
| PROP. / PROP SW | | ._PROPOSED ELEVATION REQUIRED |
| F.F.F.= | | ._FINISHED FIRST FLOOR ELEVATION REQ'D. |
| U/S FTG.= | | ._UNDERSIDE OF FOOTING ELEVATION REQ'D. |
| BASE SLAB= | | ._BASEMENT SLAB ELEVATION REQ'D. |
| GARAGE SLAB= | | ._GARAGE SLAB ELEVATION REQ'D. |
| SW | | ._SWALE |



Scale:

N.T.S

Date:

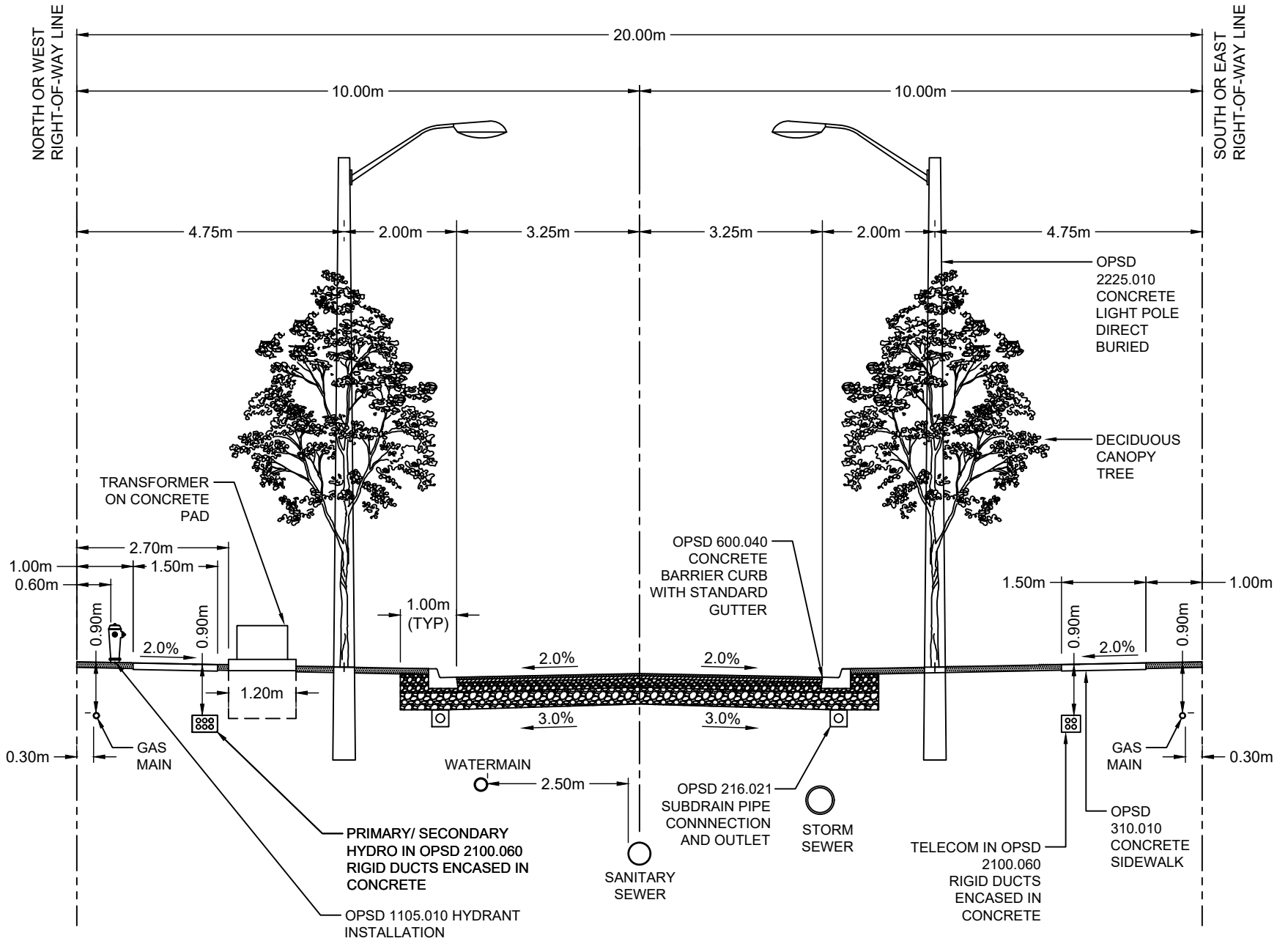
SEP 2023

Drawing No.

STD DWG R.1

TYPICAL

20 m R.O.W. URBAN STREET - NO PARKING AND SIDEWALK BOTH SIDES



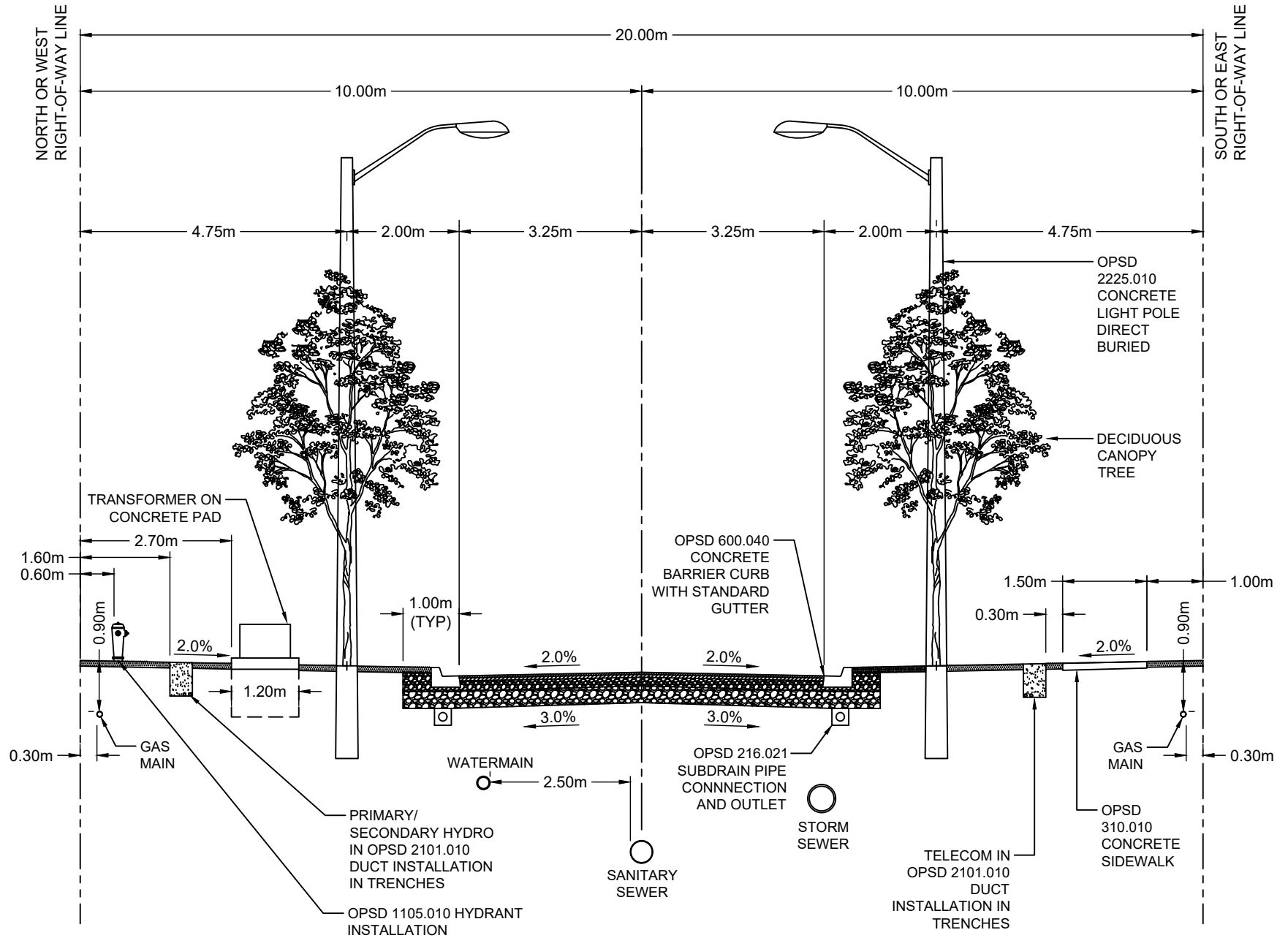
PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm

NOTE:

COLLECTOR ROADS MAY BE REQUIRED TO PROVIDE 1.25 m BIKE LANES ON BOTH SIDES WHERE INDICATED OR MANDATED BY TOWN MASTER PLANNING

TYPICAL

20 m R.O.W. URBAN STREET - NO PARKING AND SIDEWALK ON ONE SIDE



PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm



Scale:

N.T.S.

Date:

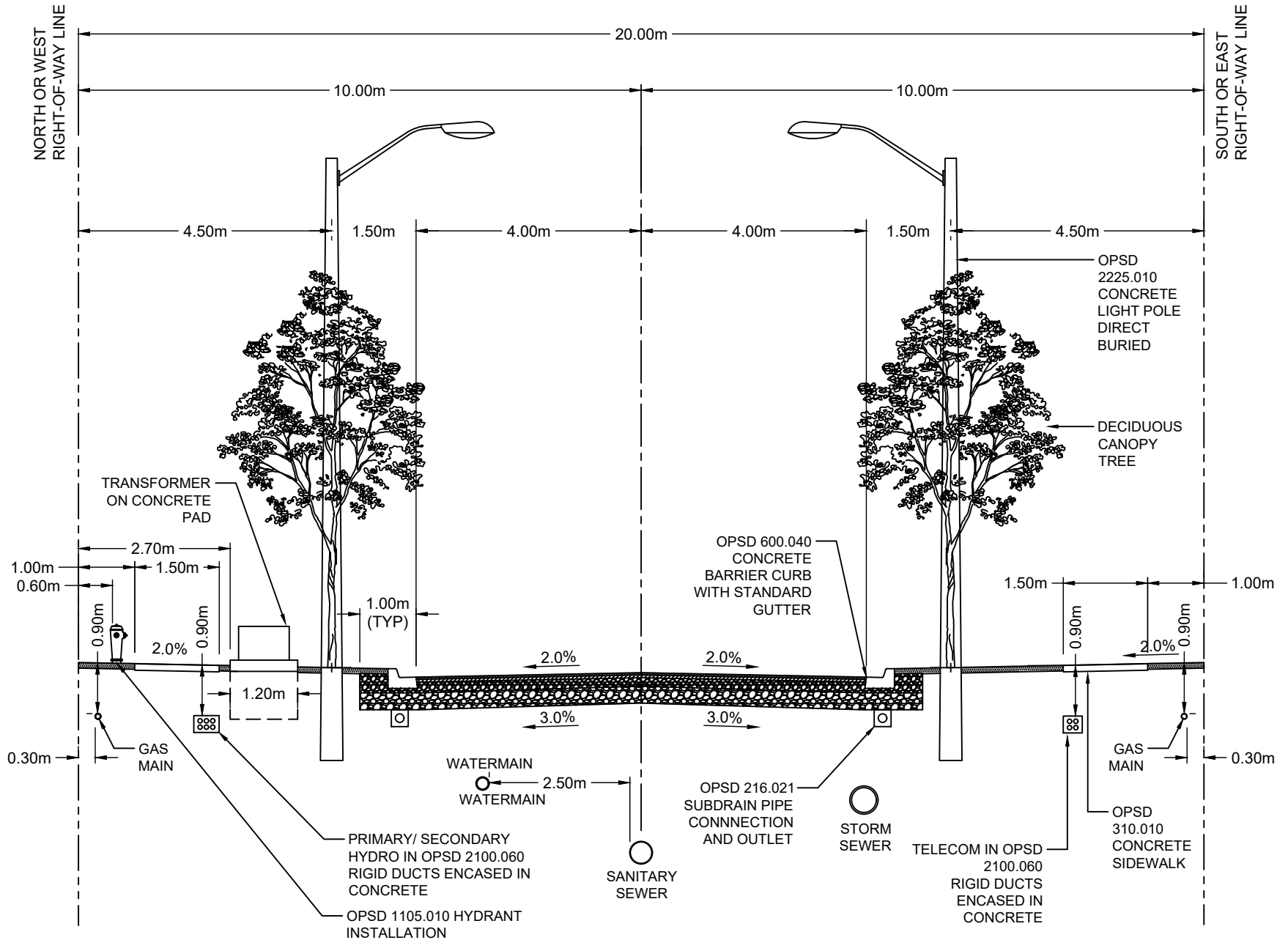
SEP 2023

Drawing No.

STD DWG R.3

TYPICAL

20 m R.O.W. URBAN STREET - YIELD PARKING AND SIDEWALKS BOTH SIDES



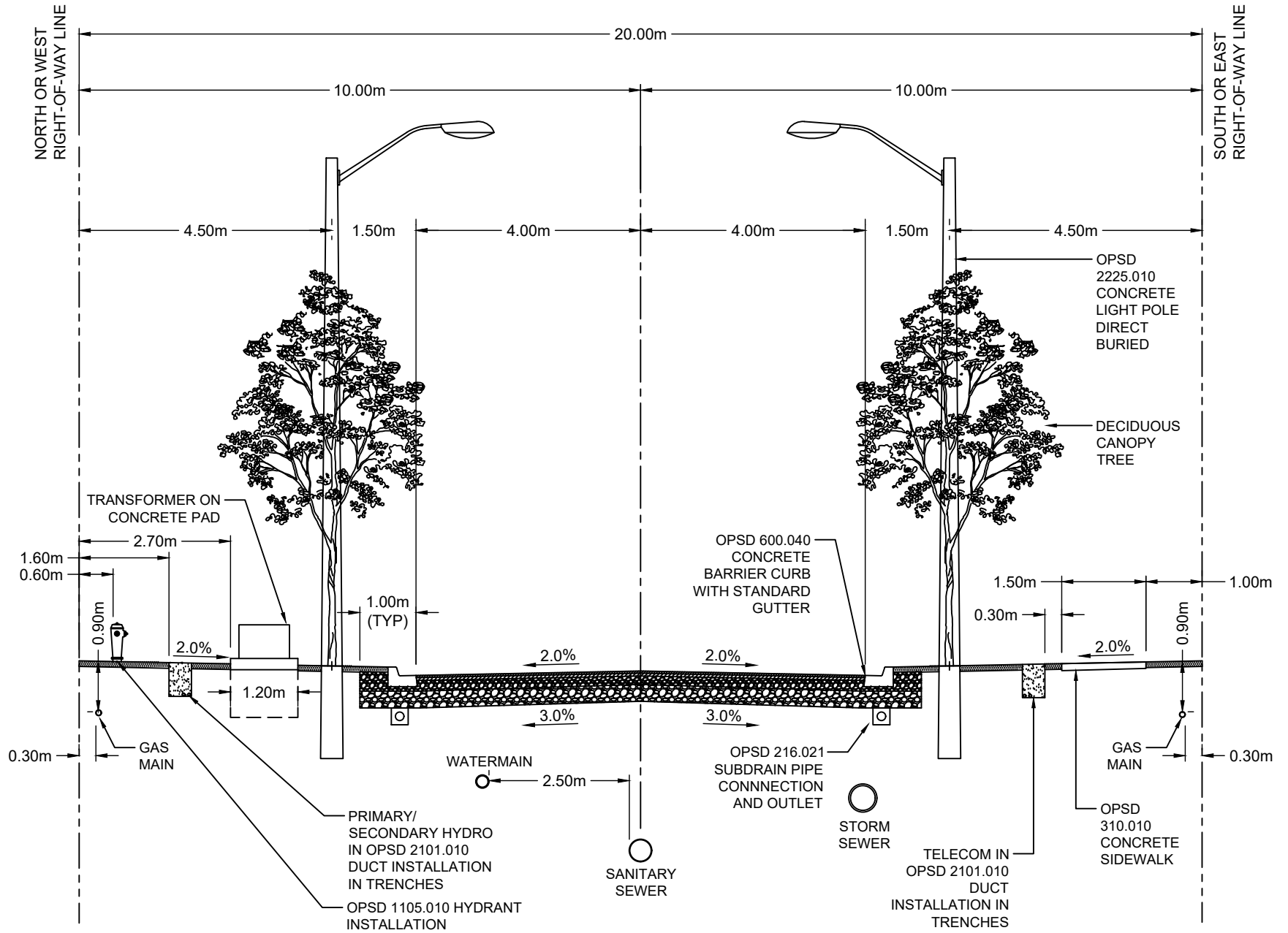
PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm

NOTE:

COLLECTOR ROADS MAY BE REQUIRED TO PROVIDE 1.25 m BIKE LANES ON BOTH SIDES WHERE INDICATED OR MANDATED BY TOWN MASTER PLANNING

TYPICAL

20 m R.O.W. URBAN STREET - YIELD PARKING AND SIDEWALK ON ONE SIDE



PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm



Scale:

N.T.S

Date:

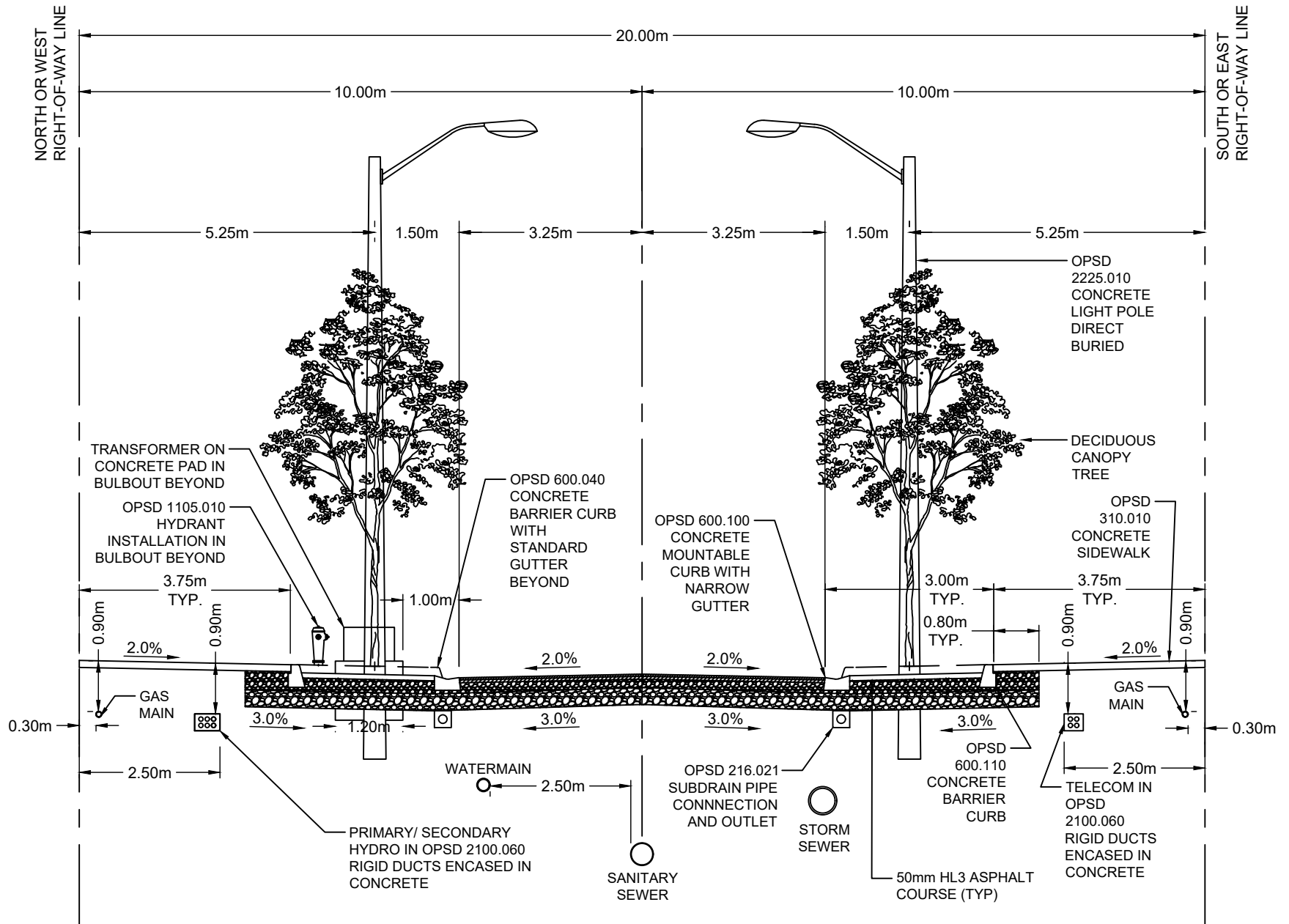
SEP 2023

Drawing No.

STD DWG R.5

20 m R.O.W. URBAN MAIN STREET - NO PARKING AND SIDEWALK BOTH SIDES

TYPICAL



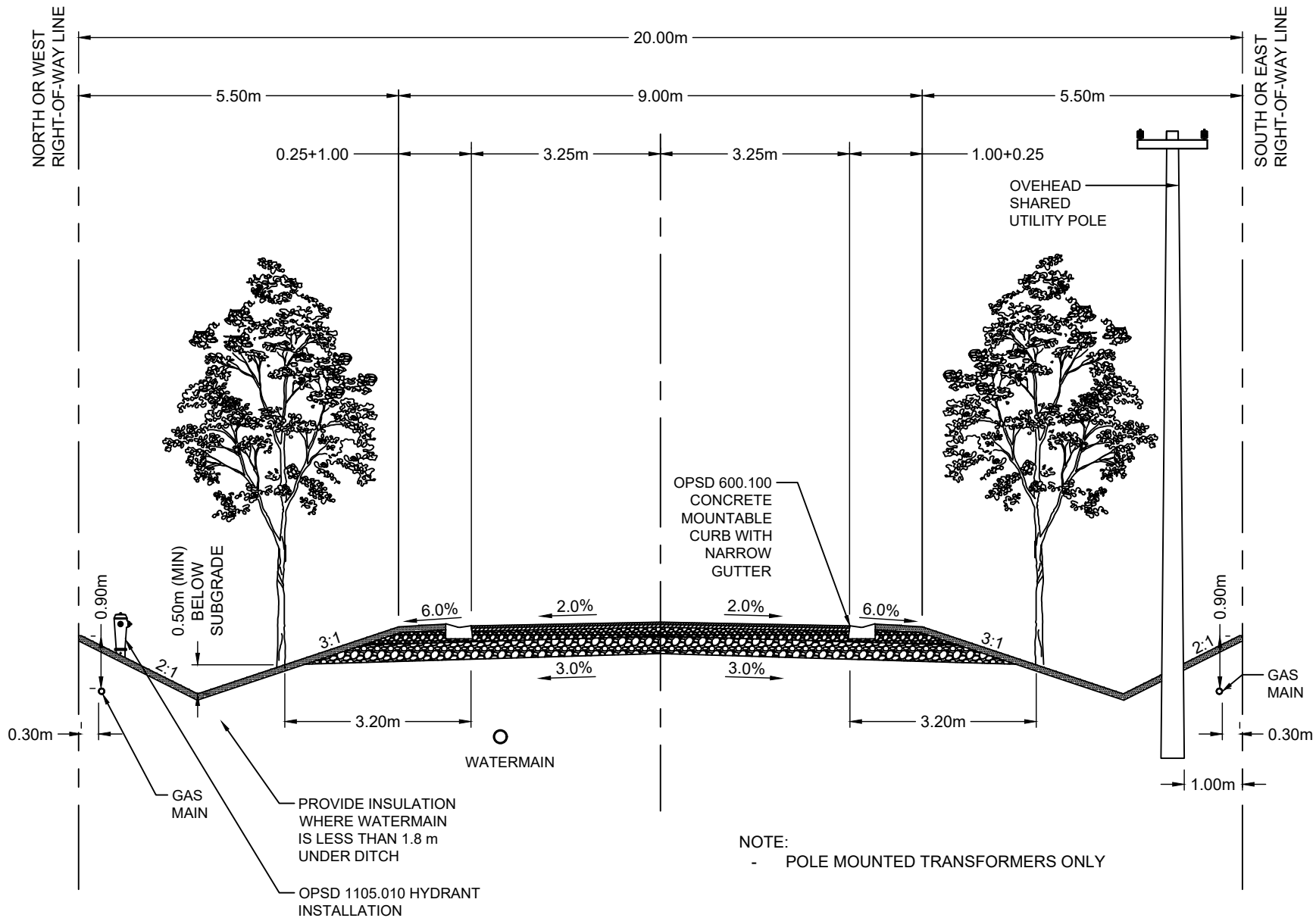
PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm

NOTE:

COLLECTOR ROADS MAY BE REQUIRED TO PROVIDE 1.25 m BIKE LANES ON BOTH SIDES WHERE INDICATED OR MANDATED BY TOWN MASTER PLANNING

20 m R.O.W. HAMLET STREET WITHOUT PARKING

TYPICAL



PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm



Scale:

N.T.S

Date:

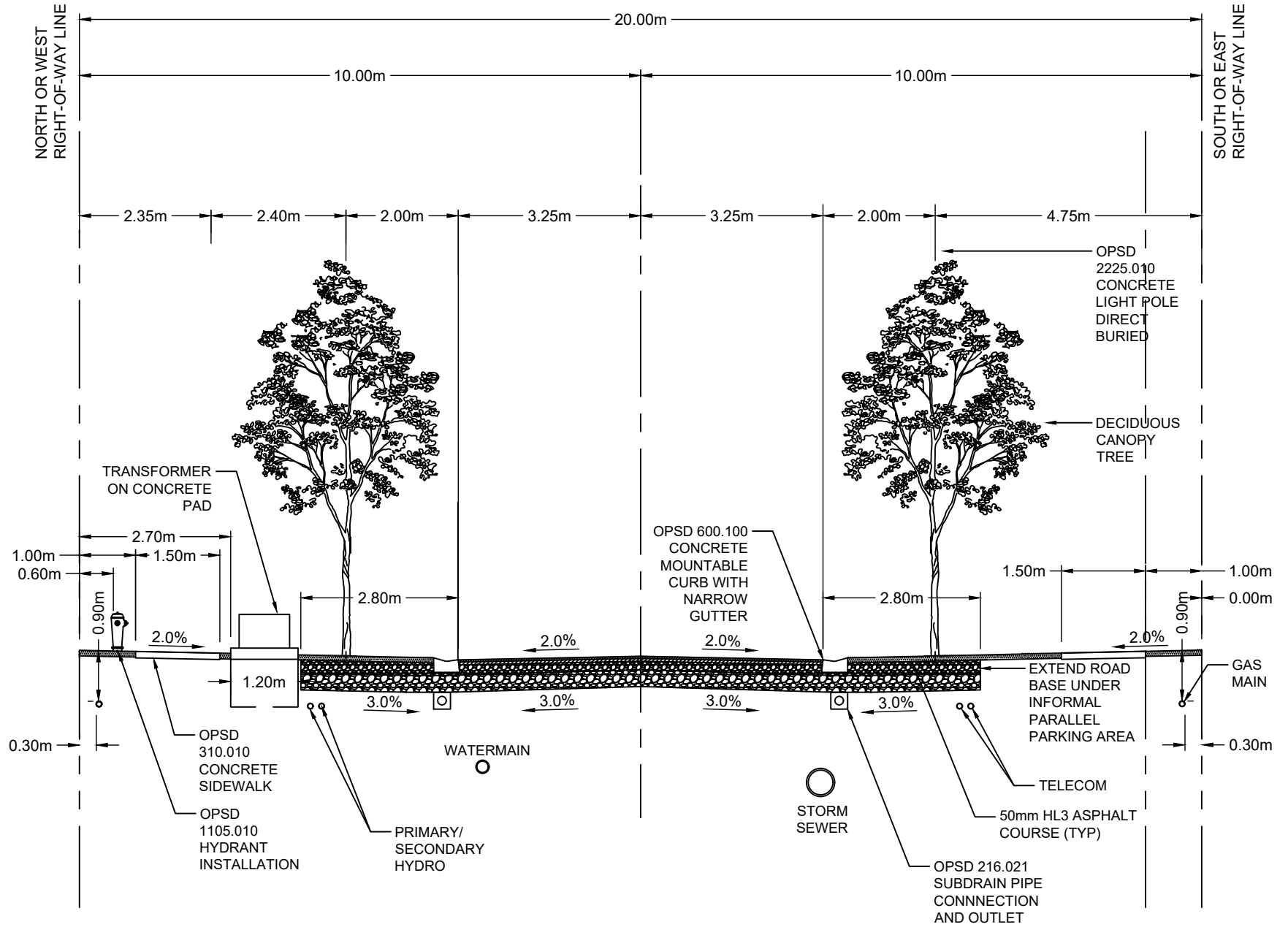
SEP 2023

Drawing No.

STD DWG R.7

TYPICAL

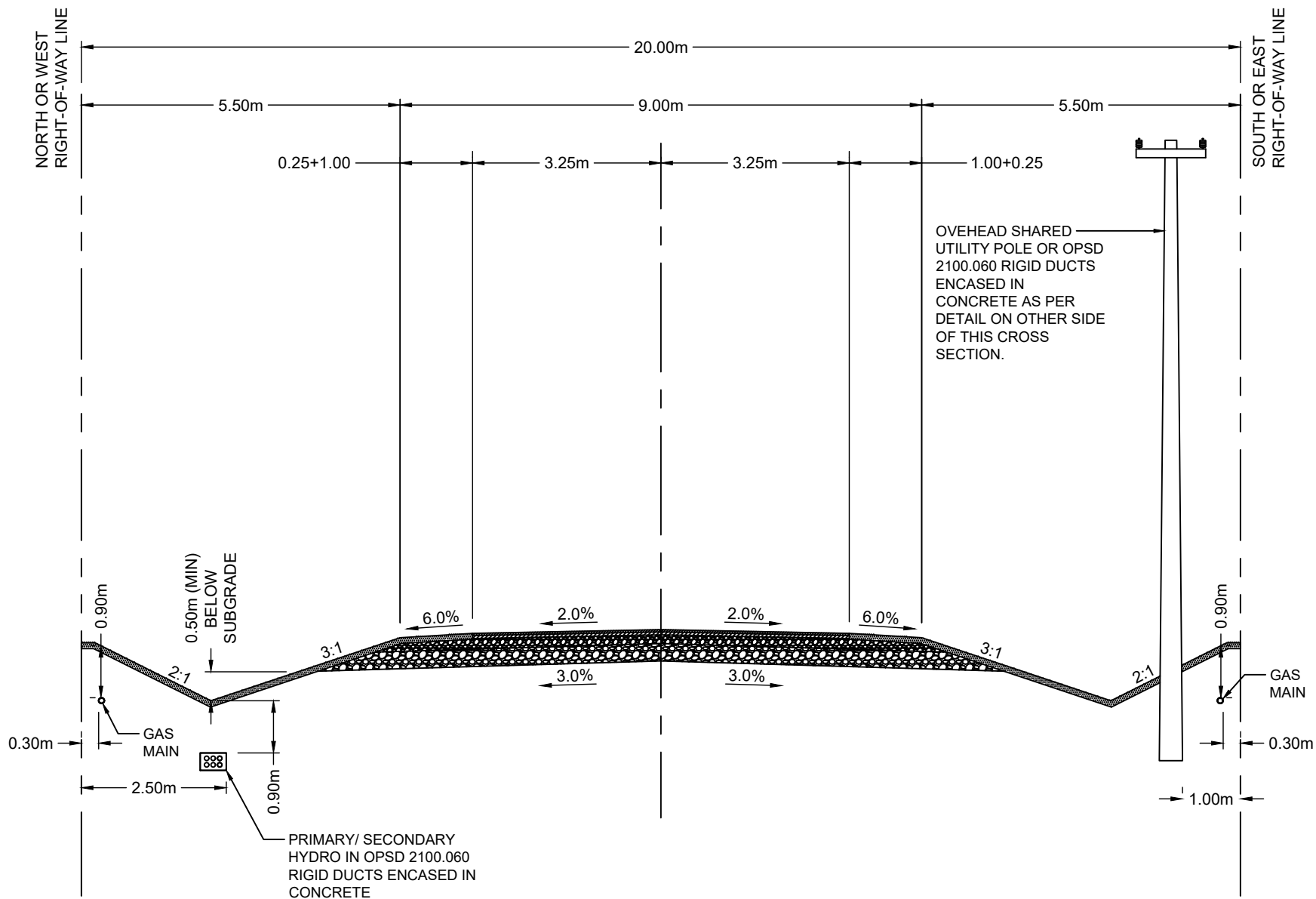
20 m R.O.W. HAMLET CENTRE STREET WITH INFORMAL PARKING



PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm

20 m R.O.W. RURAL ROAD

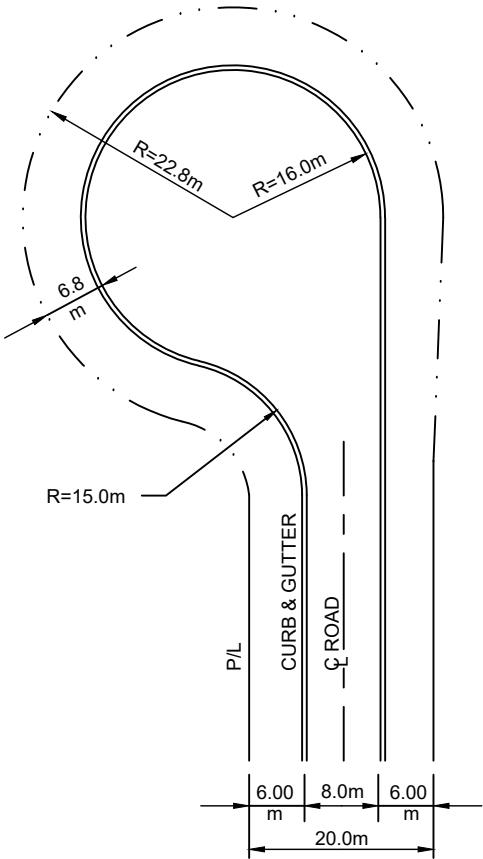
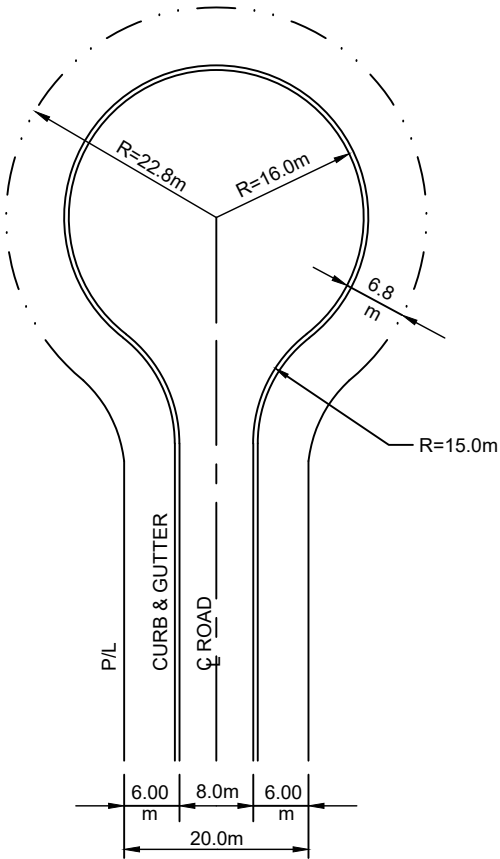
TYPICAL



PAVEMENT STRUCTURE	ASPHALT		GRANULAR	
	SURFACE	BASE	GRANULAR A	GRANULAR B
	40mm HL3	50mm HL8	150mm	300mm

URBAN CUL-DE-SAC

TYPICAL

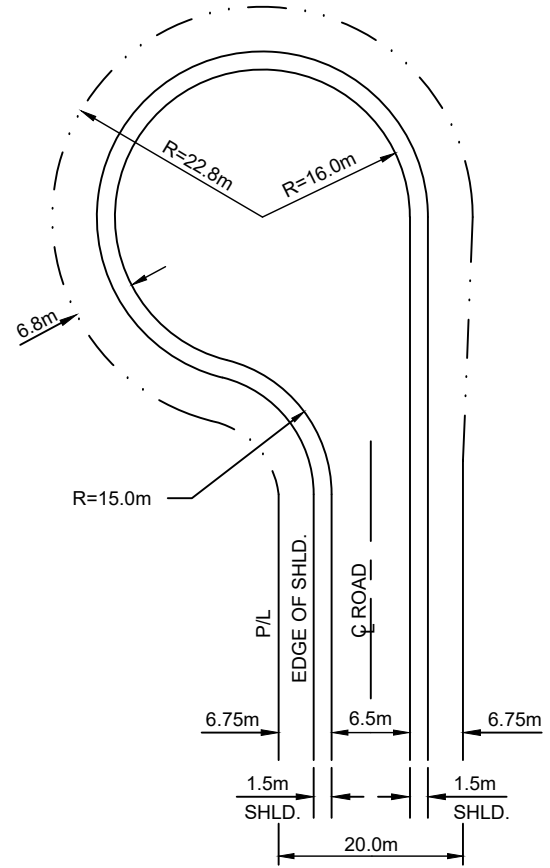
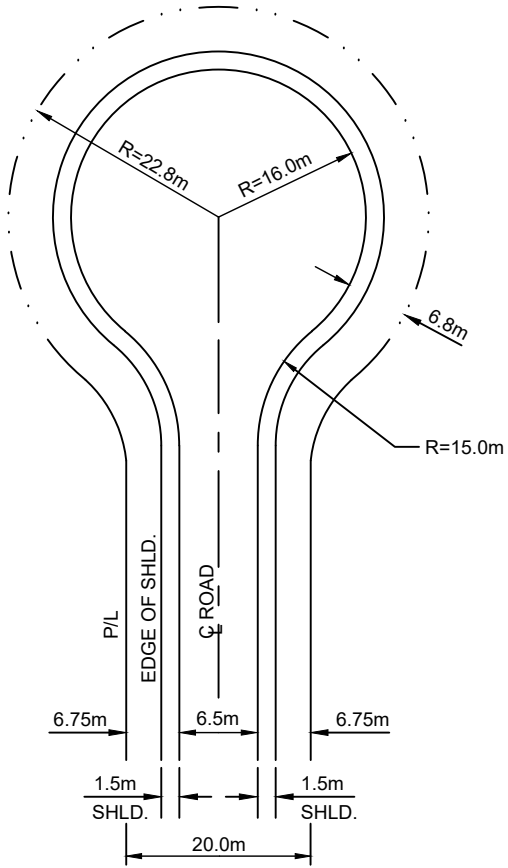


NOTES:

1. GUTTER GRADES TO BE SPECIFIED ON PLANS. MINIMUM GRADE ALONG GUTTER TO BE 0.50%
2. THIS STANDARD IS PROJECT SPECIFIC ONLY. USE ONLY WITH MUNICIPAL APPROVAL

TYPICAL

RURAL CUL-DE-SAC

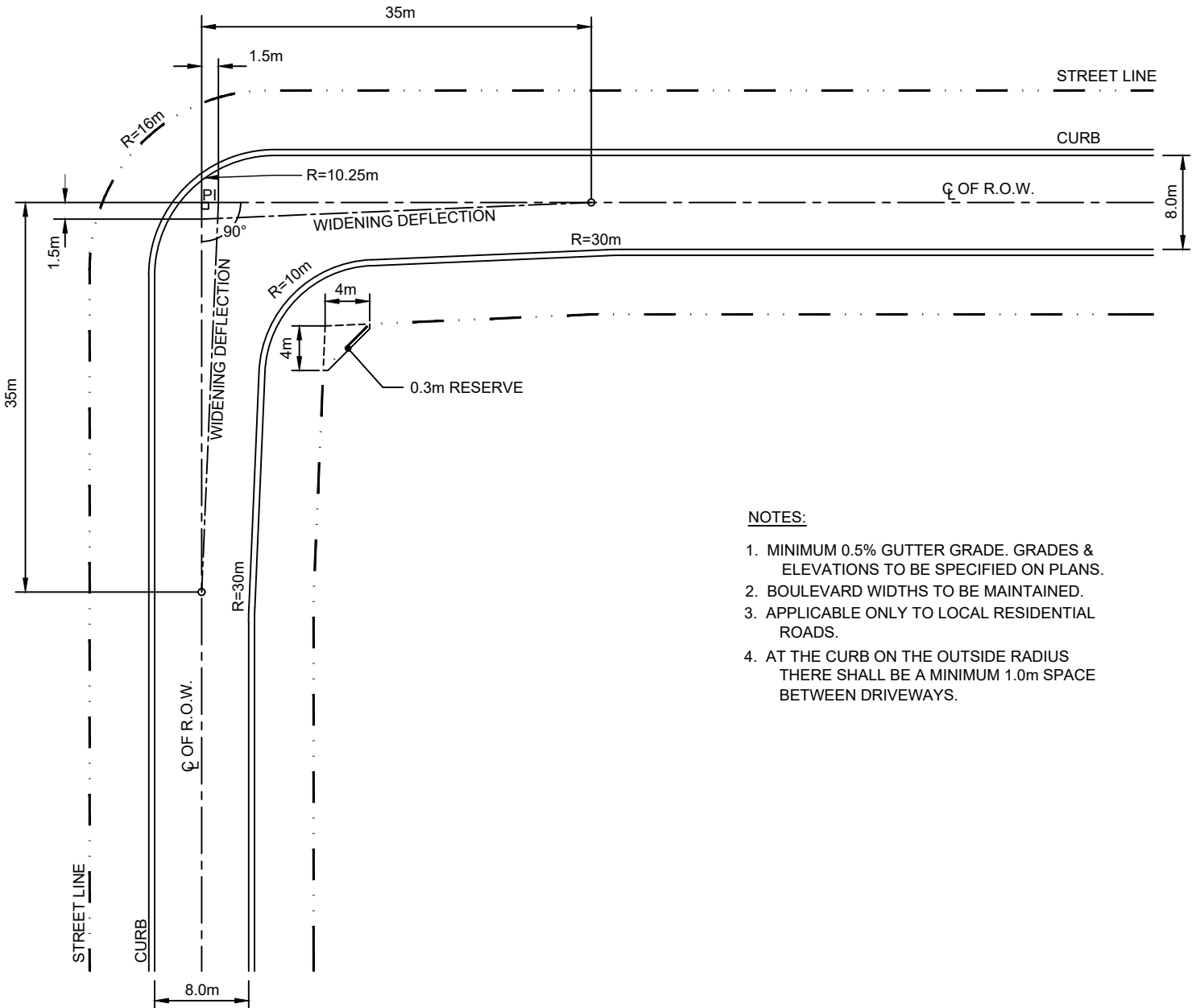


NOTES:

1. THIS STANDARD IS PROJECT SPECIFIC ONLY. USE ONLY WITH MUNICIPAL APPROVAL

TYPICAL

90° CRESCENT WITH CURB AND GUTTER - 8.0m ROAD

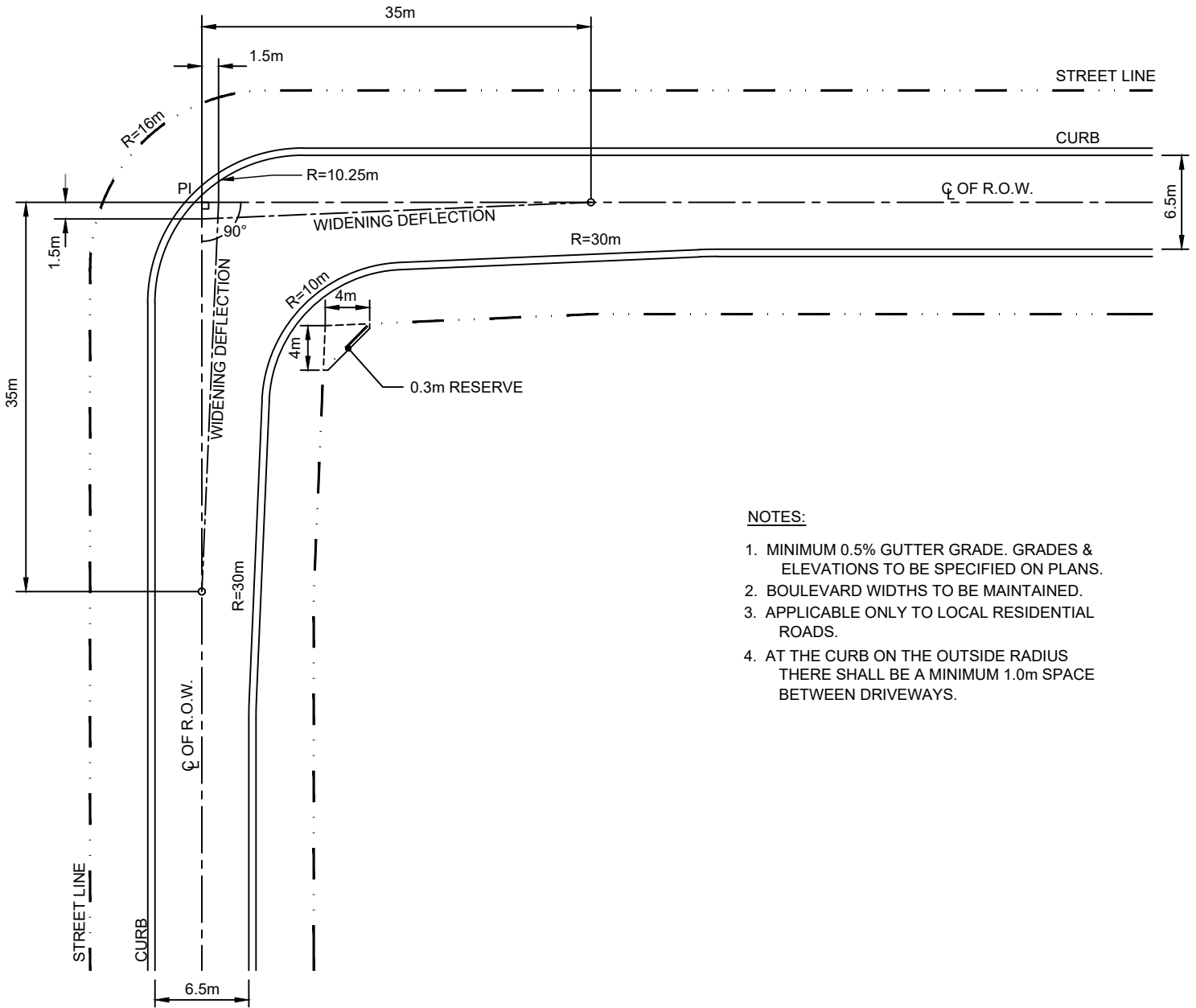


NOTES:

1. MINIMUM 0.5% GUTTER GRADE. GRADES & ELEVATIONS TO BE SPECIFIED ON PLANS.
2. BOULEVARD WIDTHS TO BE MAINTAINED.
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.

TYPICAL

90° CRESCENT WITH CURB AND GUTTER - 6.5m ROAD

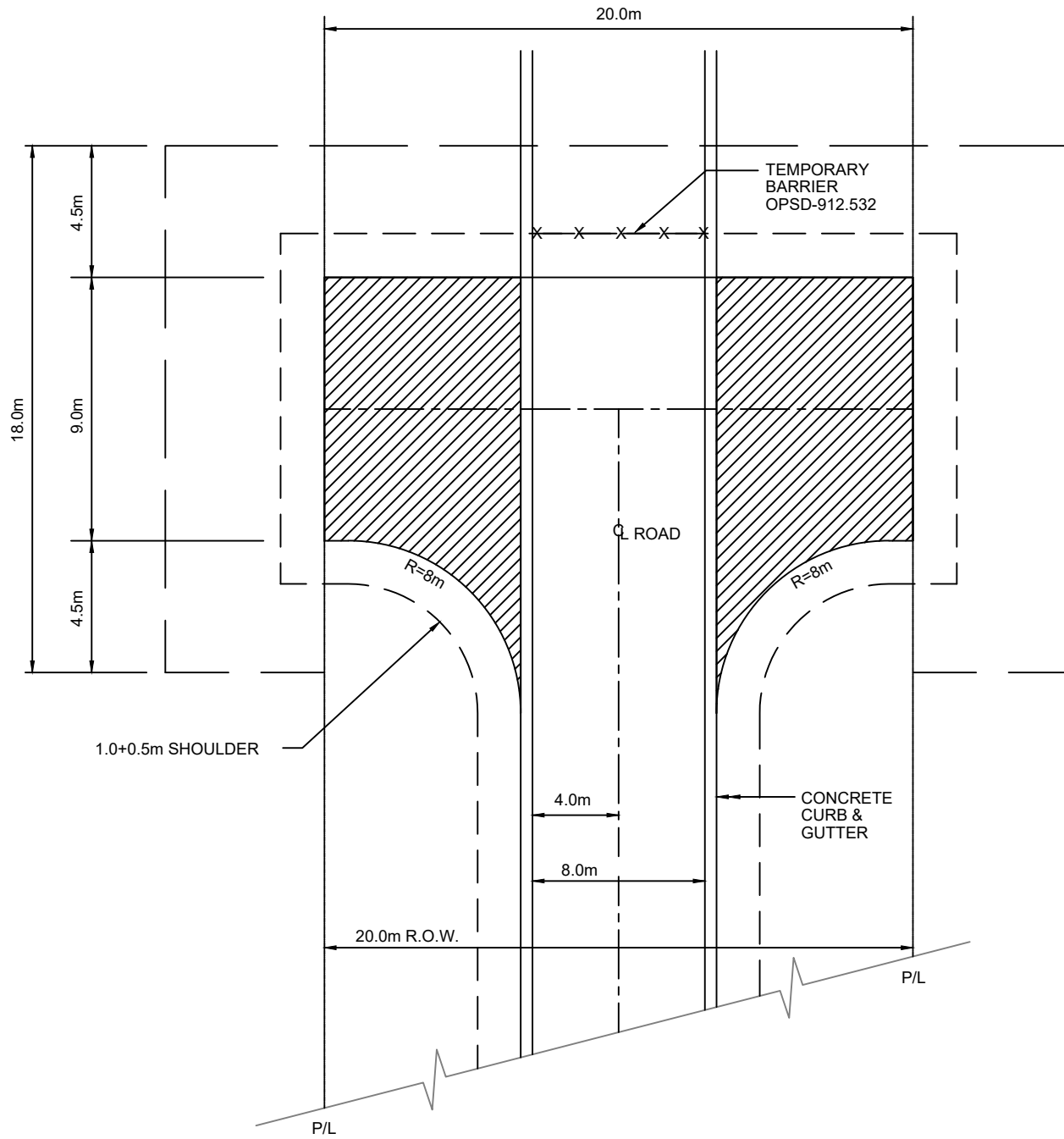


NOTES:

1. MINIMUM 0.5% GUTTER GRADE. GRADES & ELEVATIONS TO BE SPECIFIED ON PLANS.
2. BOULEVARD WIDTHS TO BE MAINTAINED.
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.

TYPICAL

20m R.O.W. STANDARD 8.0m ROAD TURNING BASIN



NOTES:

1. THIS STANDARD IS PROJECT SPECIFIC ONLY. USE ONLY WITH MUNICIPAL APPROVAL.

2. REGRADE AREA  BEHIND CURB AND PLACE 200mm GRANULAR 'A' AND 50mm HL ASPHALT.



Scale:

N.T.S

Date:

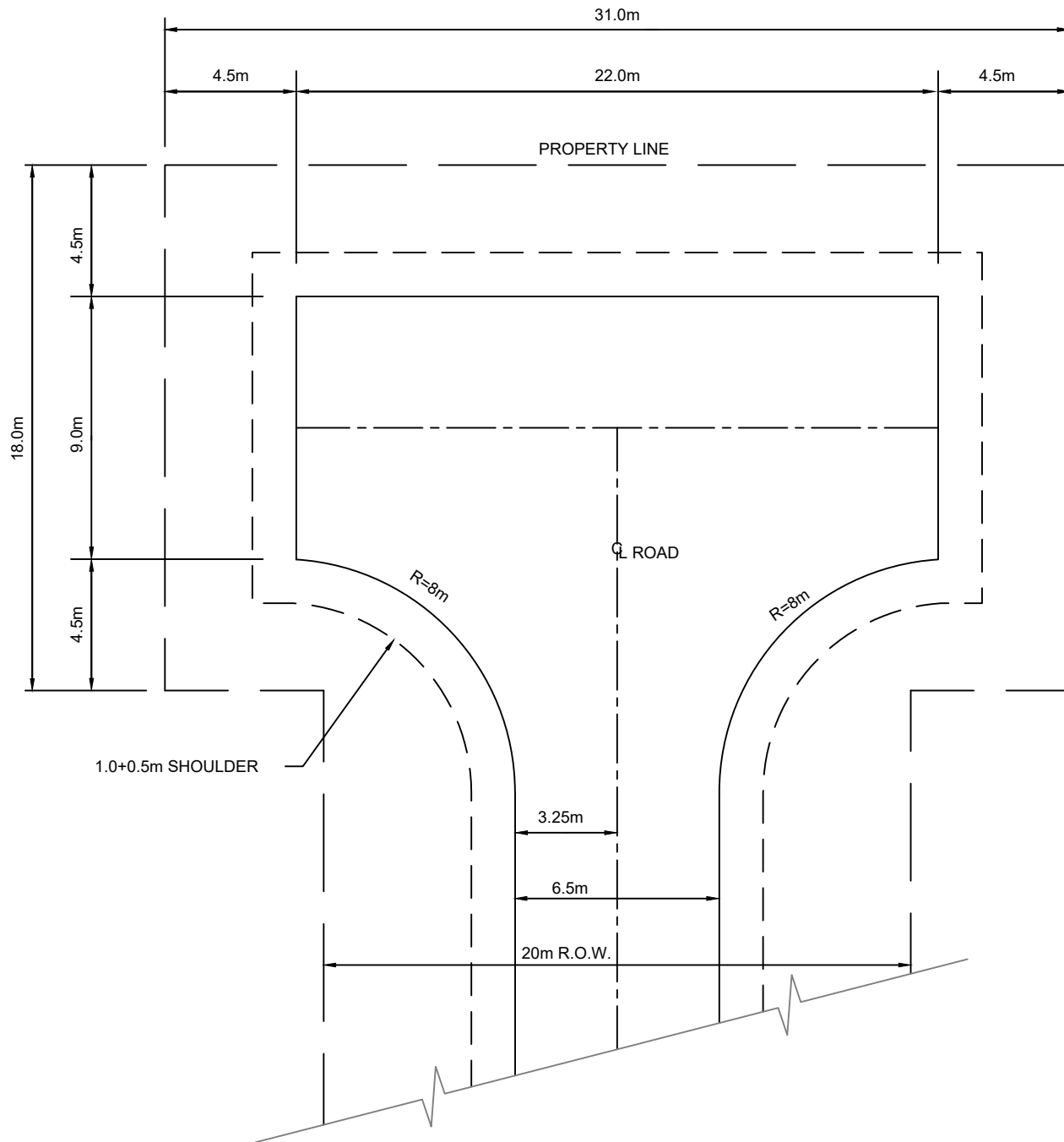
SEP 2023

Drawing No.

STD DWG R.14

TYPICAL

20m R.O.W. STANDARD 6.5m ROAD TURNING BASIN

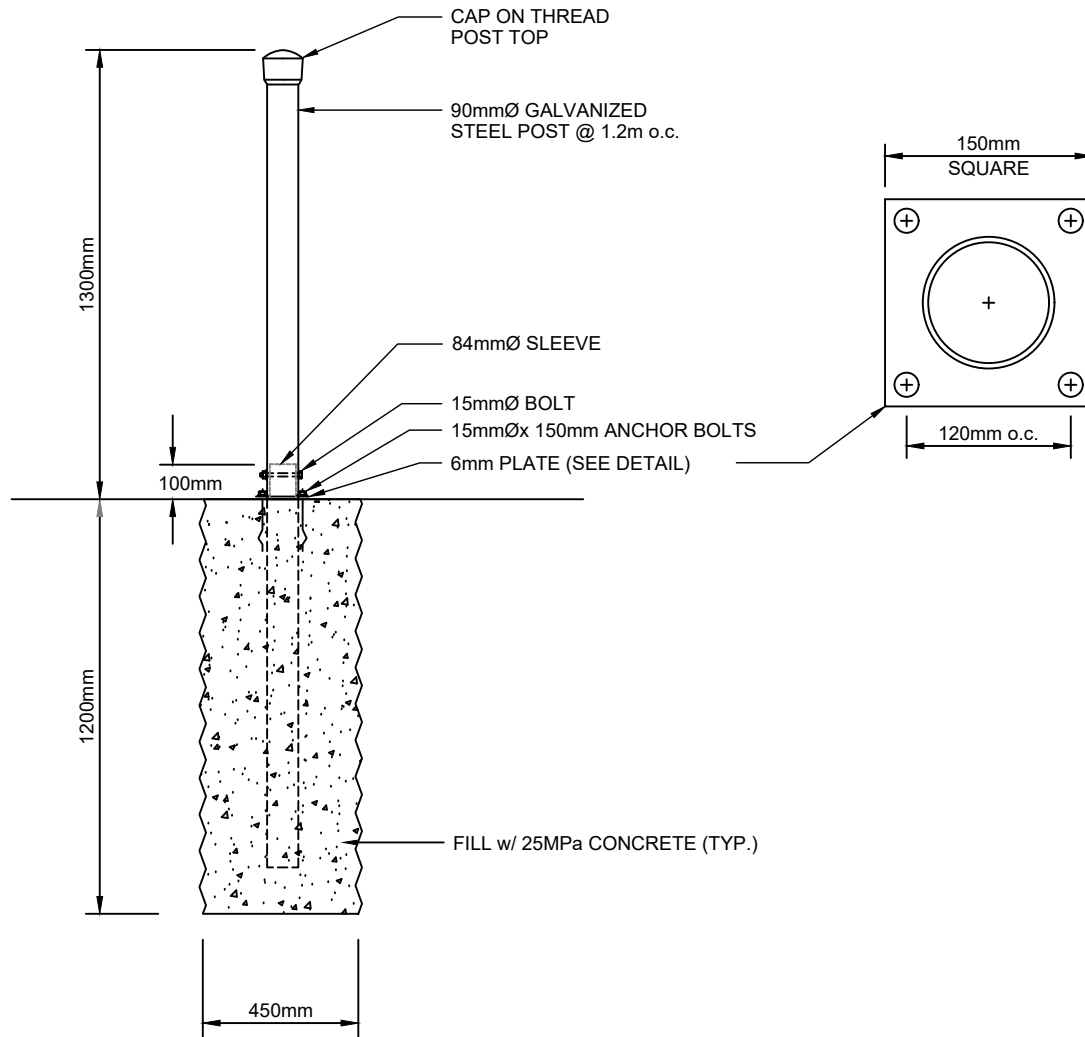


NOTES:

1. GUTTER GRADES TO BE SPECIFIED ON PLANS. MINIMUM GRADE ALONG GUTTER TO BE 0.50%
2. THIS STANDARD IS PROJECT SPECIFIC ONLY. USE ONLY WITH MUNICIPAL APPROVAL

DETAIL

REMOVABLE ENTRY POST

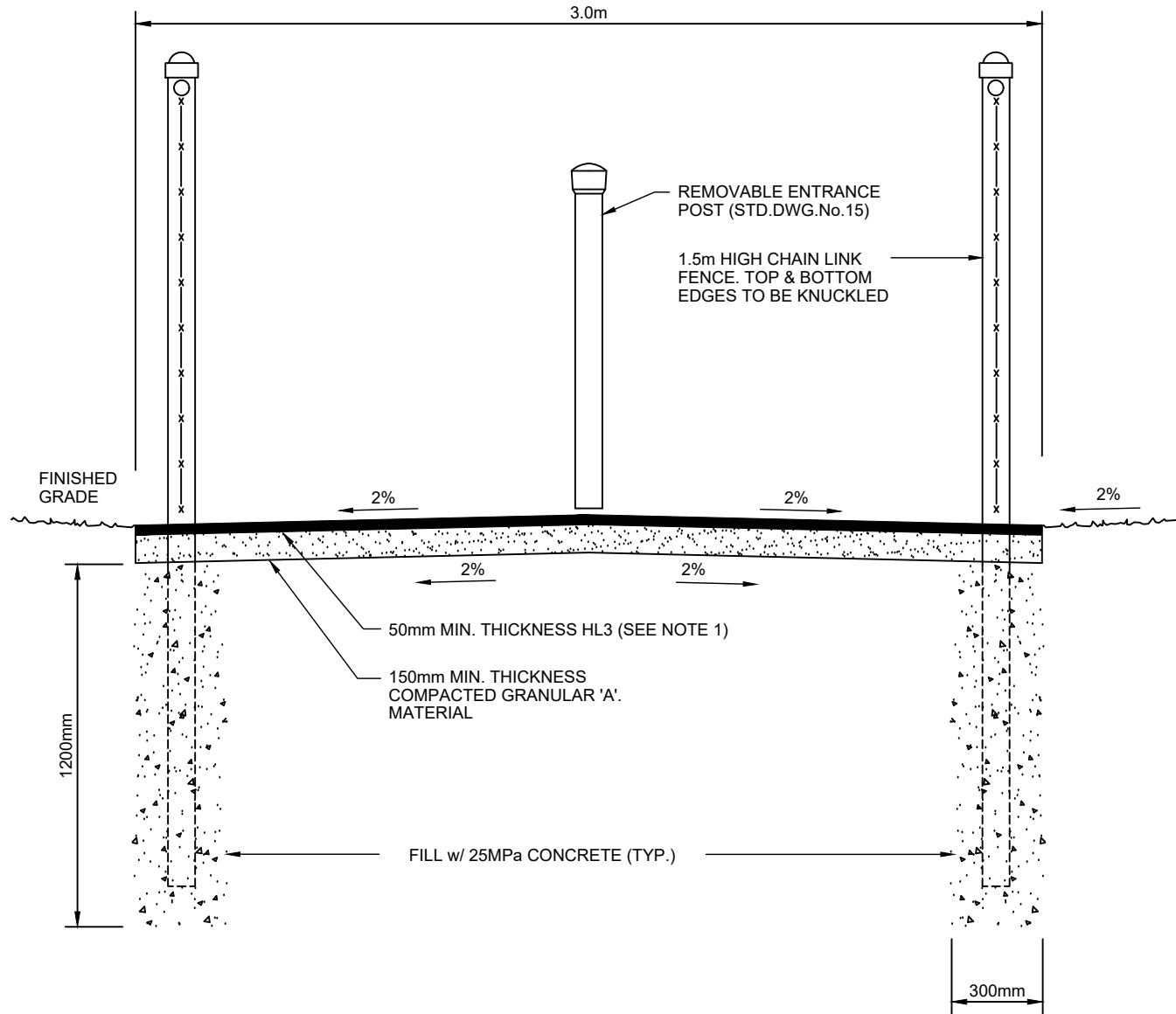


NOTES:

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

WALKWAY CROSS-SECTION

TYPICAL



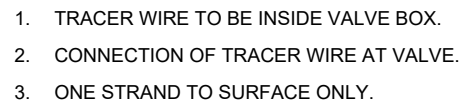
NOTES:

1. WALKWAYS BETWEEN RESIDENTIAL LOTS SHALL BE PAVED.
2. CHAIN LINK FENCE WITH TOP RAIL TO OPSS 541, CLASS 'A' FABRIC. SEE OPSS 972.130 FOR ADDITIONAL DETAILS.
3. A MINIMUM OF 1% GRADE MUST BE MAINTAINED ALONG WALKWAYS, WITH DRAINAGE OUTLETS AS REQUIRED BY PUBLIC WORKS.
4. REMOVABLE POST TO BE PLACED AT ENTRANCE APPROACH.

DETAIL

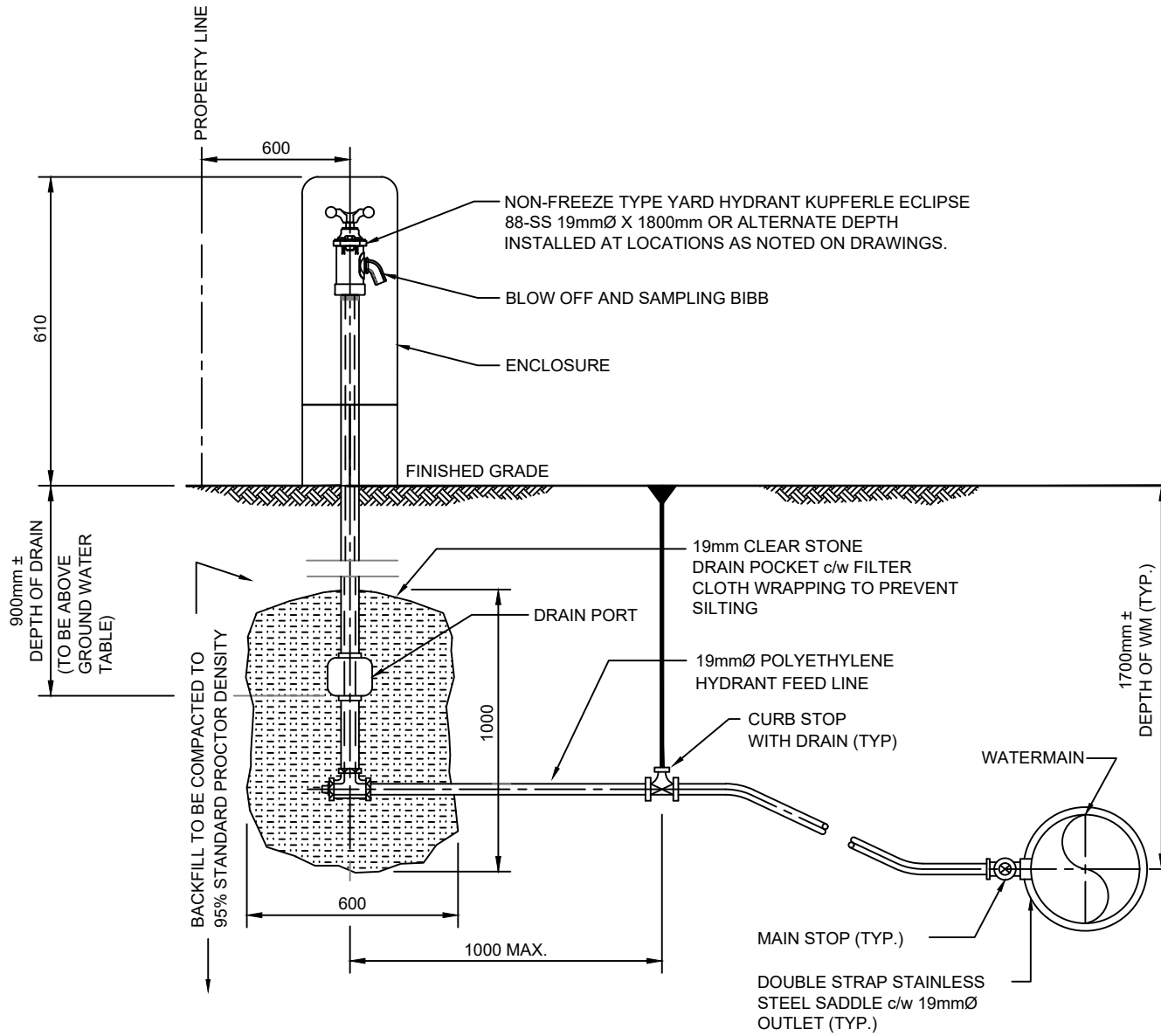


DETAIL



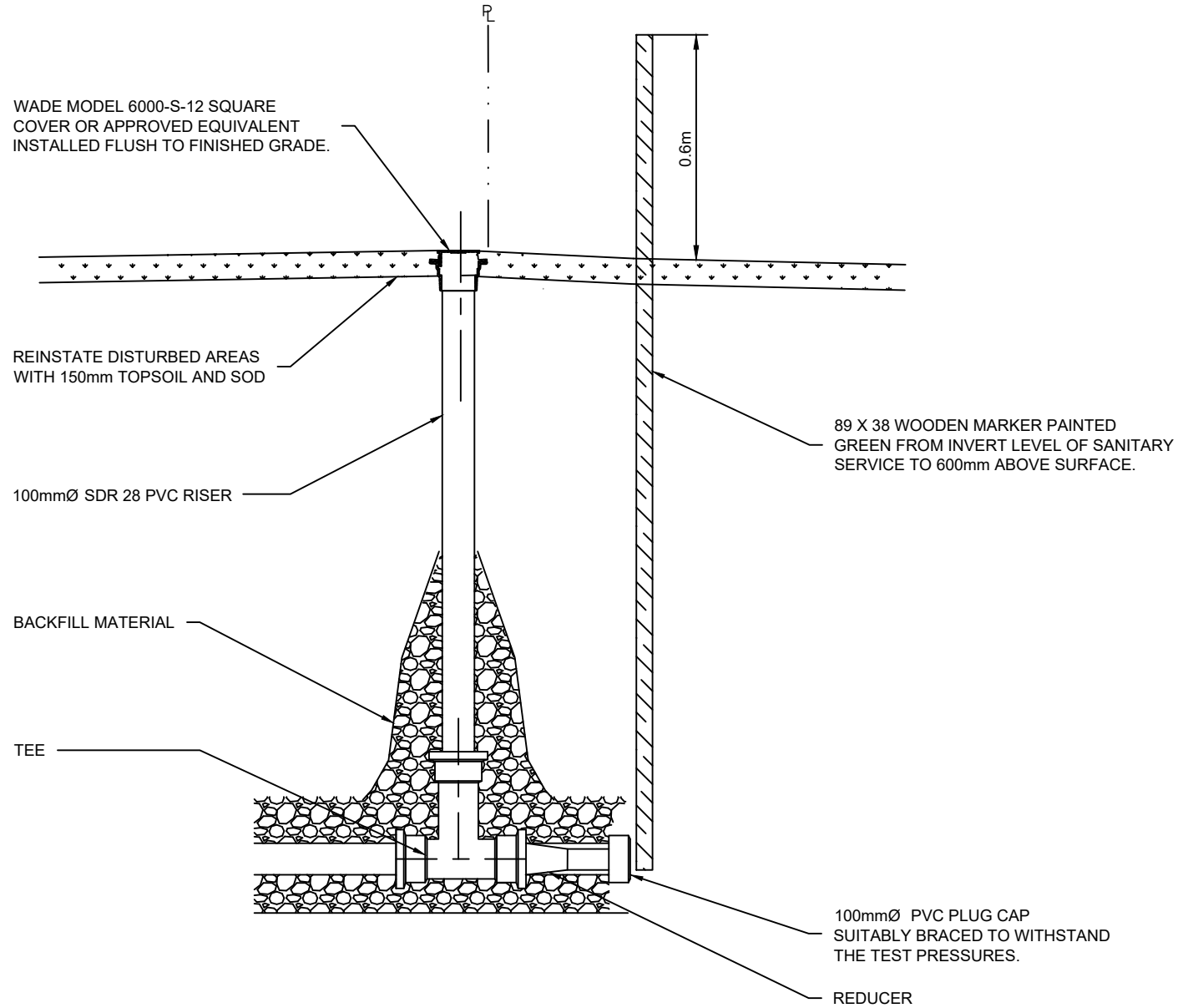
WATER SAMPLE STATION

DETAIL



DETAIL

SANITARY SEWER CLEAN-OUT



NOTES:

- 1) THE BACKFILL MATERIAL SHALL BE CRUSHED STONE OR OTHER GRANULAR 'A' MATERIALS.
- 2) WHERE INSTALLED IN GRAVEL DRIVEWAYS THE VIEW PORT CAP SHALL BE INSTALLED 150mm BELOW GRADE.
- 3) SANITARY LATERALS ARE TO BE PER OPSD-1006.010.

DETAIL

PRECAST MAINTENANCE HOLE ADD (MUNICIPAL SPECIFIC REQUIREMENTS)

FRAME AND COVER

APPROVED ADJUSTMENT
UNITS (150 MIN., 450 MAX.)
(MAX. 3 UNITS)

PRECAST MONOLITHIC
TOP SECTION

FACTORY CAST INSERTS
FOR INTERNAL FROST
STRAP INSTALLATION

WATERPROOF
MEMBRANE (SEE NOTE 1)

FACTORY CAST WALL OPENING
TO SUIT PIPE DIAMETER

CONVENTIONAL BOOT FLEXIBLE
WATERTIGHT SEAL FOR DUCTILE
IRON AND PVC PIPE, OR WALL
PIECE AND LINK SEAL WATERTIGHT
SYSTEM FOR CPP PIPE

SANITARY SEWER

CHAMBER SIZE	NUMBER OF FROST STRAPS
1200Ø	2
1500Ø	2
1800Ø	2
2400Ø	3
3000Ø	3

ALL JOINTS SHALL BE SEALED WITH AN
INJECTED SINGLE COMPONENT HYDROPHOBIC
POLYURETHANE RESIN SEAL
(FACTORY SET INJECTION TUBES TO BE USED)

NON-PENETRATING FROST STRAPS INSTALLED
ON INTERIOR OF CHAMBER
AS PER MANUFACTURER'S RECOMMENDATIONS
(SEE TABLE FOR QUANTITY)

PRECAST MONOLITHIC BASE SECTION

GRANULAR BEDDING AS SPECIFIED

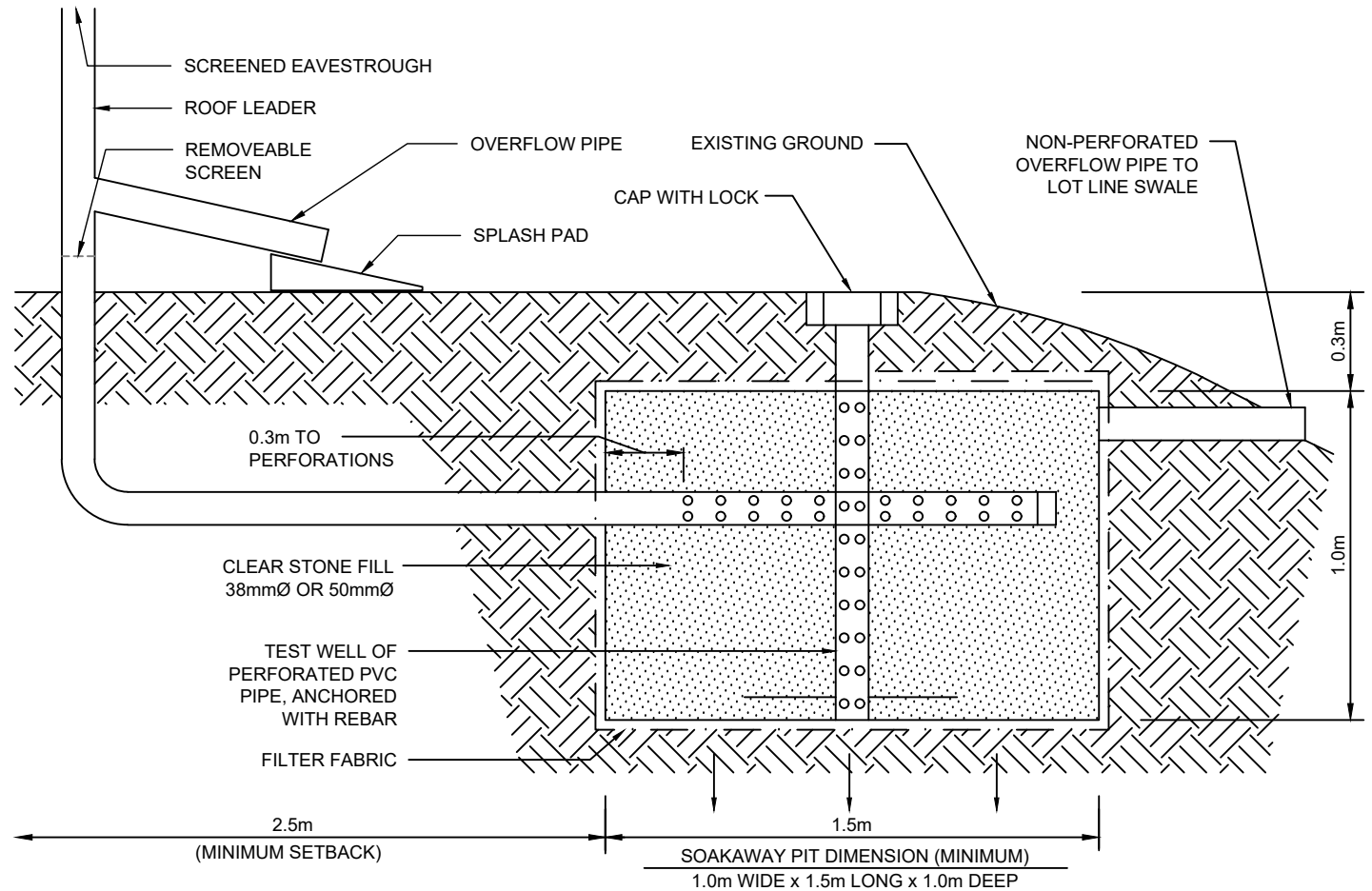
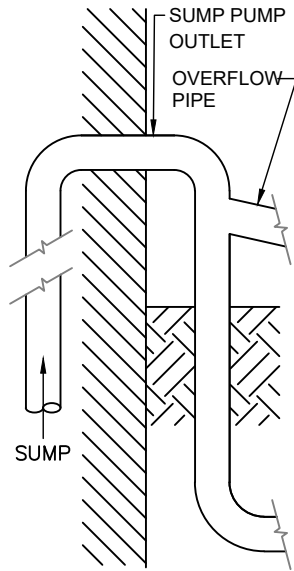
PROVIDE MINIMUM 150mm BASE EXTENSION FOR UPLIFT
PREVENTION ALL AROUND BASE (TO BE DESIGNED BY
SUPPLIER AND STAMPED BY P.ENG. LICENSED TO PRACTISE
IN ONTARIO). BASE EXTENSION TO BE FACTORY CAST.

NOTE:

1. WATERPROOF MEMBRANE TO BE "MEL-ROL" BY W.R. MEADOWS OF MILTON ONTARIO OR APPROVED EQUAL.
EXTEND COMPLETELY AROUND ALL RISER SECTION JOINTS WITH A MINIMUM 300mm WIDE STRIP.

DETAIL

ROOF LEADER/SUMP SOAKAWAY PIT

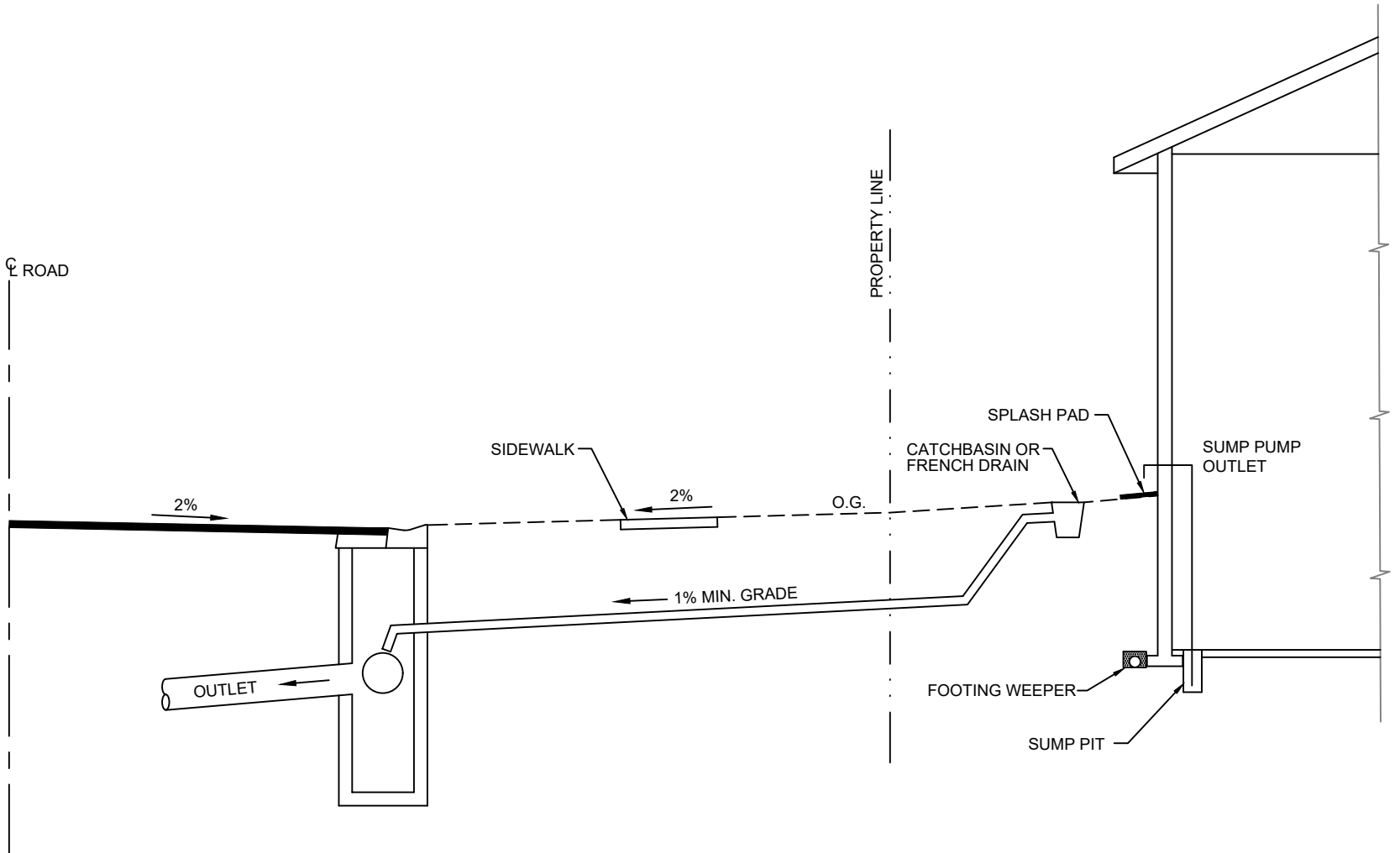


NOTES:

1. FILTER FABRIC TERRAFIX 240R OR EQUAL.
2. PROVIDE MINIMUM 0.5m CLEARANCE TO SEASONAL HIGH GROUNDWATER TABLE FROM BOTTOM OF PIT.
3. BASEMENT FLOOR SLAB MINIMUM 0.3m ABOVE SEASONAL HIGH GROUNDWATER TABLE.
4. THIS STANDARD IS PROJECT SPECIFIC ONLY - USE ONLY WITH MUNICIPAL APPROVAL.

STORM SERVICE CONNECTION

TYPICAL



NOTES:

1. MIN. SIZE 100mmØ STORM CONNECTION PIPE OUTLET TO BE AT OR ABOVE STORM SEWER PIPE OBVERT.
2. STORM CONNECTION TO BE MIN. OF 1.0% GRADE.
3. THIS OPTION SHALL ONLY BE USED WHERE THERE IS A RISK OF WATER FLOW OVER SIDEWALKS. IF THERE IS NO SIDEWALK, A SPLASH PAD AND OVERLAND FLOW TO THE CURB SHALL BE THE STANDARD.