

1.0 Design and Report Standards

The objective of Design and Report Standards is to provide:

- A clear and concise guide for prospective developers and Professional Engineers of the technical standards and procedures required to design, process and obtain approvals for the installation of public works associated with urban and rural subdivision development.

2.0 General

This document will be subject to revisions from time to time. The City of Quinte West reserves the right to make revisions having due regard for applications already in the review process. Individuals or groups affected accordingly will be notified by the City of Quinte West, and revisions will become effective on the date of notification.

Each development proposal is looked at on its own merit and may require additional items over and above established policies, procedures, standards, Official Plan and Zoning Bylaw requirements.

(Contents of this document are subject to change without further notice)

3.0 References

In addition to the standards specified in this manual, the Design and Report Standards shall give consideration to the following industry standards, specifications or publications:

Publications

- Ontario Provincial Standard Specifications
- Stormwater Management and Design Manual 2003
- Bay of Quinte Remedial Action Plan Guidelines
- Municipal Engineers Association – Municipal Works Design Manual
- City of Quinte West Official Plan
- Ontario Highway Bridge Design Code
- Master Drainage Plan or Stormwater Management Plan for the site, as applicable.
- Guideline for Use at Contaminated Sites in Ontario
- Transportation Association of Canada - Geometric Design Standards for Canadian Roads
- Transportation Association of Canada - Guide for the Design of Roadway Lighting
- Ontario Ministry of Transportation – Geometric Design Standards for Ontario Highways
- Ontario Ministry of Transportation - Manual of Uniform Traffic Control Devices
- Guidelines for the Design of Sanitary Sewer Works, Storm Sewers, Water Distribution Systems, Water Storage Facilities, Servicing in Areas Subject to Adverse Conditions, Water Supply for Small Residential Developments, Seasonally Operated Water Supplies

Standards

City of Quinte West Standard Drawings

- All Series

Permits/Approvals

- Ministry of Natural Resources
- Ministry of Transportation
- Ministry of the Environment
- Lower Trent Conservation Authority
- Quinte Conservation Authority
- City of Quinte West Planning Department Site Plan Approval
- City of Quinte West Bylaw 08-30 "Site Alteration Bylaw"
- Development Charges By-law(s)
- Standard Site plan / Subdivision Agreement

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5.0 Reports

The City of Quinte West may request reports or studies to further investigate site conditions and provide recommended solutions. The need for these studies will be determined during the pre-consultation stage.

5.1 Geotechnical Report

The purpose of this report is to examine subsurface conditions such as:

- Soil type(s);
- Groundwater levels;
- Depth of refusal, bedrock, etc and;
- Soil bearing capacity.

As part of a complete Geotechnical Report submission, the report shall:

- Examine and confirm subsurface conditions and provide recommendations to accommodate proposed works on the site.
- Confirm the adequacy of the City's minimum standard of flexible pavement design or recommend a higher standard of design if site conditions warrant.
- Examine and recommend a method of accommodating sub-grade drainage.
- Address the suitability of native soils, excavated and /or imported materials for roadway construction, trench backfill and building foundation construction.
- Identify construction methods including those related to backfilling or the placement of fill materials.
- Be accompanied by a scaled plan of the site showing test pit or borehole locations, together with a log of test pit or bore hole findings tied to geodetic datum.

All reports must be signed and stamped by a Professional Engineer or a Professional Geoscientist licensed in the Province of Ontario.

5.2 Traffic Impact Report

The purpose of a Traffic Impact Report is to examine existing traffic conditions and what impact a proposed development may have. All subdivision developments are to provide a traffic impact analysis based on projected traffic flows and the ultimate build out of the development unless specifically waived in writing by the Director of Public Works and Environmental Services. A Traffic Impact Report is not required for Site Plan applications unless identified in the Site Plan Approval process.

As part of a complete Traffic Impact Report submission, the report shall:

- Examine existing traffic conditions.
- Provide estimated peak flows generated and traffic movements generated as a result of the project.
- Confirm the status of existing traffic conditions and what impact the development will have.

- Provide recommendations including upgrades to City infrastructure such as storage lane requirements and traffic control devices based on the estimated peak flows generated that will minimize or improve existing traffic conditions.

All reports must be stamped by a Professional Engineer licensed in the Province of Ontario.

5.3 Noise Impact Study

All developments adjacent to or within close proximity to major noise sources such as those generated by existing or future rail and road facility expansions shall be required to conduct a noise and vibration analysis to demonstrate compliance to MOE guidelines. These reports are required to be submitted with the Plan of Subdivision Application.

Noise impact studies should be prepared by a qualified individual, preferably a Professional Engineer with experience in environmental acoustics.

5.4 Stormwater Management Report

All developments shall be required to provide a Stormwater Management Report demonstrating the means of compliance to the City's Stormwater Management Policies and the Bay of Quinte Remedial Action Plan Guidelines for both quality and quantity control unless specifically waived in writing by the Director of Public Works and Environmental Services. A Stormwater Management Report is not required for Site Plan applications unless identified in the Site Plan Approval Process.

As part of a complete Stormwater Management Report submission, the report shall:

- Provide background information such as zoning, proposals, existing watershed studies, etc. to identify drainage issues
- Review receiving drainage system for components, existing problems, right to outlet, conflicts with future works, etc.
- Assess impact to the receiving drainage system.
- Identify construction operation and maintenance issues.
- Provide supporting documentation, maps and calculations to support any recommendations or proposals.

Stormwater Management Reports should be prepared by a qualified individual, preferably a Professional Engineer with experience in Stormwater Management.

5.5 Environmental Site Assessment

A Phase 1 Environmental Site Assessment shall be undertaken by each site proponent (owner) for all areas of the subdivided lands intended for public occupancy including all lands which are to be conveyed to the City of Quinte West unless specifically waived in writing by the City's Director of Public Works and Environmental Services. An Environmental Site Assessment is not required for Site Plan applications unless identified in the Site Plan Approval Process.

As part of a complete Environmental Site Assessment submission, the report shall:

- Identify, characterize, or delineate the nature and extent of contamination both above and below grade on the property in accordance with CSA document Z768-94.
- Provide assurances that the environmental quality of subject lands are suitable for the intended land use as described within the Guideline for Use at Contaminated Sites in Ontario (MOE, re. 1997) or latest editions.

Environmental Assessment Reports should be prepared by a qualified individual, preferably a Professional Engineer with experience in Environmental Assessments.

6.0 Drawing Standards

Part of a complete submission will include a complete set of engineering drawings. All plans submitted shall be digitally prepared and printed on standard size 600mm by 900mm (24"x 36") sheets.

All plans must be complete, legible, and concise as to the materials, methods and details of construction. Each individual plan must also contain:

- The legal description of all individual parcels of land in accordance with the plan of survey.
- A north arrow.
- A title block depicting the date, date of recent revisions, and scale of the plan in metric units.
- All "approved" street names.
- The stamp and signature of a Professional Engineer registered with the Professional Engineers of Ontario (P.E.O.)

Plans which are "Approved for Construction" shall also be submitted to the Public Works Department in digital format compatible with municipality's current version of AutoCAD software and in Adobe Portable Document Format (pdf).

7.0 Engineering Drawings

A complete set of engineering plans will be comprised of the following:

7.1 Cover Sheet

A cover sheet bearing the name of the development, the subdivision owners name, a key plan showing the site location relative to two nearby major highways and a table of plan contents.

7.2 General Service Plan (maximum scale 1:1000)

The General Plan will indicate the general overall scope of the project and the geographic relationship to surrounding lands. The General Plan will illustrate:

- Existing utility services and roads within and around the development

- Proposed storm, sanitary collection systems, water distribution systems (mains only), with details for:
 - ✓ Pipe diameters
 - ✓ Valve sizes and locations
 - ✓ Hydrants
 - ✓ Maintenance holes numbered in sequence
 - ✓ Direction of flow in sewers
 - ✓ Standard service lateral connection symbols
- Storm and Sanitary Design Charts (can also be attached to a Plan & Profile Drawing)
- Existing and proposed easements.
- The general location of test pits or boreholes from the soils report.
- A legend of symbols (OPSS 100).
- A list bearing the description, location and elevation of benchmarks to be used in establishing vertical control on the site. A minimum of two benchmarks to geodetic datum is to be provided with locations preferably within the project boundaries.
- A reference index showing the coverage of all plan and profile drawings and their corresponding drawing numbers within the set.
- Phase limits.

7.3 Lot Grading Plan (maximum scale 1:500)

The Lot Grading Plan shall establish the final grade control for all lots and blocks within the development in accordance with the Municipality's Lot Grading and Stormwater Management requirements and objectives. The plan must contain sufficient detail to accurately assess the impact of post development surface drainage both within and adjacent to the owner's lands. This plan will contain:

- A key plan
- A legend using standard symbols.
- A list bearing the description, location and elevation of bench marks to be used in establishing vertical control on the site. Benchmarks are to be to geodetic datum and a minimum of two is required within the project boundaries.
- Existing ground contours or elevations in and adjacent to the development as established by field survey. Within and adjacent to the subdivision boundary, the City will accept elevations established by recent/modern aerial photography with the exception of all intersecting lot lines (existing and proposed) at the subdivision boundary. The Owner's Engineer shall verify the accuracy of all aerial contours by appropriate spot checks. Where adjacent lands are currently under development the approved proposed grades shall be identified and used in determining the treatment at the common boundary.
- The limits of cut and fill required in pre-grading.
- Existing vegetation limits, including that which is to be preserved.
- Existing ditches, swales and watercourses in and adjacent to the development.
- Existing buildings, foundations to be demolished.
- Proposed grades at each property corner and at the building platform plus any other grades required conveying the intent of the plan.
- Proposed gradients along side and rear lot lines (in %).

- The proposed direction of surface run-off using arrows.
- Road centerline elevations calculated at the projected lot line extension or at regular chainage intervals (20 meter min.) which ever is the lesser.
- Control point road grades BVC, EVC, sag, crest etc.
- Location and inlet elevation of all existing and proposed storm drainage inlets. All structures are to be numbered. (Roadside inlets may be shown in table form)
- Miscellaneous lot grading types and drainage patterns.
- Proposed swales and ditches including typical cross sections.
- Slope limits resulting from cut or fill operations.
- Typical grading details and specifications.
- Existing and proposed easements.
- Culverts including invert, diameter and length
- Details of all structures required for slope stability where maximum slopes cannot be achieved.
- Location and pertinent details of all sedimentation and erosion control measures.

7.4 Plan and Profile Drawings (1:500 Horizontal, 1:50 Vertical)

The Plan and Profile Drawings will provide the detailed information required for construction of roads and municipal services.

7.4.1 Plan Portion

- Horizontal control data for the road centerline including
 - ✓ P.I. Station chainage
 - ✓ length of tangent
 - ✓ degree of curve
 - ✓ curve length
 - ✓ beginning of curve chainage
 - ✓ end of curve chainage
- All existing services with original plan referenced.
- Cross reference numbers of adjoining plans and match lines.
- All municipal services to be constructed including service laterals with non standard locations dimensioned to property lines.
- Pipe diameters and pipe material. Symbols and notes may be used to depict size and type of standard building service laterals.
- Utility Structures i.e. Storm and Sanitary Maintenance holes, valve chambers etc. with corresponding identifier i.e. number or letter symbol (matching design sheets)
- Catchbasin locations and connection details such as
 - slope, invert
 - top of grate elevations (May be shown in table form)
- Streetscape locations, such as; utility pedestals, community mailboxes streetlights and fire hydrants.
- All traffic control devices including pavement markings
- Any facilities to address public transit (bus lay-bys etc.)

7.4.2 Profile Portion

- A profile of the existing grade and proposed road grade along the centerline of pavement projected directly below the plan view.
- Existing and proposed centerline road elevations.
- Vertical control data, including:
 - ✓ points of intersection
 - ✓ tangent gradients
 - ✓ K - factors
 - ✓ super-elevation details as necessary.
- A profile of the road subgrade elevation showing grade treatment, transition treatment, method of achieving subgrade drainage etc.
- Rock soundings at sufficient intervals to determine road construction requirements and to determine estimated rock excavation quantities for the construction of underground services.
- Test pit locations and critical bore hole results.
- Station chainage along the centerline of the road - maximum spacing 20 meters plus those for establishing vertical control.
- All proposed and existing pipes showing length, inside diameter, gradient, invert elevations at maintenance holes (san. storm), depth of cover (water), type of pipe material, and bedding requirements including specification numbers and reference to detail drawings.
- Storm and Sanitary Maintenance holes, valve chambers etc., including:
 - Type (i.e., O.P.S.D Type)
 - Size (barrel diameter or inside dimensions)
 - Chainage and offset from centerline.
 - Top of grate elevation
 - Identifier i.e. number or letter symbol (matching design sheets)
 - Details of drop structures, safety platforms, etc.
- Proposed and existing watermains with type of pipe material, bedding requirements and depth of cover.
- Cross reference to detail drawings elsewhere in the set for sewer maintenance holes or special watermain details.
- All pipe clearance details at crossing of pipes.

7.5 Detail Plan (Scale to suit)

Detail Drawings will be required when there is not sufficient space on the Plan and Profile Drawings, or other drawings to fully describe the necessary works. The Detail Drawings might include:

- Road cross section, curb and sidewalk details (mandatory).
- Details of special chambers, such as metering chambers.
- Details of special structures, which might include storm sewer inlets and outlets, or retaining walls.
- Details of special drainage features, including stormwater retention/detention ponds.
- Pumping station details.
- Walkway fencing details.

7.6 Utility Plan (maximum scale 1:750)

The designer will compile the Utility Plan for utilities other than water and sewer from the requirements of the various public and private utility agencies (Electric, Telephone, Natural Gas, Cable TV, Canada Post). The Utility Plan also details municipal requirements for street lighting. The Utility Plan shall include:

- A legend using standard symbols.
- Streetlight specifications including electrical distribution system.
- Typical utility trench details, duct locations.
- The location of all existing and proposed streetlights in and adjacent to the development.
- The location of utility structures and street furniture such as Electric, Telephone, Cable TV, Gas and Canada Post in and adjacent to the development.
- Connection details for all proposed streetlights, including wiring location, duct requirements, electrical source and fuse pedestal locations.
- Existing and proposed utilities (Electric, Telephone, Cable TV, Gas and Streetlight circuitry) including those in common trench (in schematic form).
- Specific duct and trench cross-section details for road crossings.

7.7 Storm Drainage / Sanitary Drainage Plans (Scale to suit)

A separate drainage area plan for storm and sanitary drainage calculations shall be prepared.

The Storm Drainage / Sanitary Drainage Plans are used to identify the contributing areas to each system and how it plans to be controlled. They should identify:

- The street and lot layout of the subdivision, identifying street names and property descriptions.
- Existing and proposed sewers and maintenance holes are to be shown, identifying manhole numbers, and sewer sizes and direction of flow.
- Contributing sub-area boundaries are in hectares.
- To scale the extent of drainage areas outside the development supported by existing ground contours, which shall also be shown.
- Each drainage area plan will include a key plan and a legend.

All reports must be signed and stamped by a Professional Engineer in the Province of Ontario.

7.8 Park Development Plans

Contact the Director of Public Works and Environmental Services for requirements.

7.9 Miscellaneous Plans (as required)

- Noise Attenuation / fencing
- Tree Preservation Plan (if required)

- Tree Planting Plans (if required)
- Bridge plans
 - Traffic related
 - ✓ Electrical
 - ✓ Lane markings
 - ✓ Signal layout

7.10 As-Built Drawings

The purpose of as-built, as-recorded, or as-constructed drawings is to confirm that the project was constructed as to the approved design and to provide the City with accurate records of its infrastructure.

As-built information will be recorded by the on site inspector as the work progresses and in turn the information shall be provided to the designer engineer.

The as-built plans shall include:

- Inverts of all gravity sewers at the maintenance holes
- Inverts of all gravity sewer laterals at the property line.
- Top of watermain elevation
- Pipe lengths and grade
- Pipe materials
- Top of grate, inlet and manhole elevations
- Street addresses as provided by the City of Quinte West.

All formal submissions must be directed through the assigned Planner in the City's Planning Services Department.

- Three (4) complete sets of as-built prints on bond paper.
- One (1) complete digital set on CD in both current standards of AutoCAD DWG and Adobe PDF.

All drawings and data files become the property of the City and the City and its agents may use these drawings and data files as the City sees fit, without compensating the owner or the owner's engineer.