



Municipal Development and Servicing Guidelines

January 2025

Table of Contents

1.0	PLANNING PROCESS OVERVIEW (General)	8
1.1	Purpose	8
1.1.1	Applicable Law	8
1.1.2	Pre-consultation	9
1.2	Planning Application Process	9
1.2.1	Draft Plan Approval Application	9
1.2.2	Site Plan Application	11
1.2.3	Subdivision Agreement/Pre-servicing Agreement/ Site Plan Agreement	11
1.2.4	Draft Plan of Subdivision/Condominium Approval	11
1.2.5	Application Fees	12
1.3	Engineering Process	12
1.4	Development Approvals	13
1.5	Agreements	14
1.6	Developer's Engineer	14
1.7	Utilities	15
1.8	Design Standard	15
2.0	SUBMISSION OF PLANS, REPORTS, AND STUDIES	17
2.1	Submission Procedure	17
2.2	Plans and Drawing Requirements	17

2.3	Plan-Profile Drawings	18
2.4	General Servicing Plan	20
2.5	Approvals and Acceptance	20
2.5.1	Ministry of Environment, Conservation and Parks (MECP) and Conservation Authority Approvals Ministry of	20
2.6	Other Acceptances.....	21
2.7	Final Approval of Submission	21
2.8	Services for Individual Residential Lots.....	21
2.9	Easements	22
2.10	Preparation of Development Agreement	22
2.11	Requirements Prior to Commencement of Construction.....	23
2.12	As Recorded Drawings and Record Field Survey	23
 3.0	 ROADS	 25
3.1	General.....	25
3.2	Clearing and Grubbing.....	26
3.2	Grading	26
3.3	Road Construction	26
3.4	Roadway Surface Asphalt	27
3.5	Curbs.....	27
3.6	Sidewalks.....	27
3.7	Accessibility	28
3.8	Turning Circles	28

3.9	Adjacent Roads	28
3.10	Daylighting Requirements at Intersections	28
3.11	Location of Utilities	28
3.12	Community Mail Box Requirements	29
3.13	Snow Clearing	29
3.14	Driveway Entrances	29
3.15	Other Requirements.....	30

4.0 STORM DRAINAGE/STORMWATER MANAGEMENT..... 31

4.1	Approval of Design and Plans	31
4.2	Stormwater Management Report	31
4.3	Connection to Municipal System	32
4.4	Design Criteria.....	32
4.5	Location	32
4.6	Semi-Urban Developments.....	32
4.7	Rural Development – Ditches and Culverts	34
4.8	Sewer Pipe Material.....	34
4.9	Storm Sewer Construction	35
4.10	Maintenance Holes and Catch Basins	35

5.0 UTILITIES AND STREET LIGHTING..... 37

5.1	Telecommunications	37
5.1.1	Telecommunication Companies	37

5.2	Electrical	37
5.3	Gas Servicing	37
5.4	Street Lighting	37
6.0	LOT GRADING AND DRAINAGE	39
7.0	PARKLAND AND LANDSCAPING.....	41
7.1	Parkland	41
7.2	Landscaping	41
7.3	Walkways	42
7.4	Trails/Pathways.....	42
8.0	TRAFFIC AND STREET SIGNS	43
9.0	ASSET MANAGEMENT	44
10.0	PAYMENT TO DEVELOPERS.....	45
11.0	REVISIONS TO SERVICING STANDARD.....	46
12.0	DEFINITIONS	47

LIST OF APPENDICES

Appendix “A” – Typical Urban Cross Sections

Appendix “B” – Rural Road Cross Sections

Appendix “C” – Stormwater Management Standard for Site Plans or Small Developments

About the use of this document.

This document is intended to provide directions for the preparation of detailed designs for development applications within the Township of Howick. It is the responsibility of the consultant to ensure use of the latest version of this Development Manual. When noted, consultation with Howick staff is required to confirm applicable design standards.

1.0 Introduction to the Development & Servicing Guidelines

The Township of Howick is committed to supporting responsible land development through a coordinated and efficient planning process. Planning services in the Township of Howick are delivered by County Planning & Development staff through a shared service model. Development applications, including subdivisions, consents, and condominiums are processed by the Howick Township Planner in collaboration with Township and Huron County staff. Together, staff provide clear guidance and work to support developers from the initial concept to final occupancy, ensuring a smooth approval process through effective problem-solving and timely communication.

Application packages, detailed process guidelines, and supporting materials for applications made under the Ontario Planning Act are available on the Huron County Planning Department website. All planning applications must be submitted through the CloudPermit platform, with further submission provided by the County.

Site Plan Control and Condominiums typically have a requirement that the owner enter into a development agreement with the Township regarding matters such as the construction of roads and servicing which will require the completion of engineered drawings to the standards contained herein.

1.1 Purpose

This document is to provide the reader with a description of the process undertaken to get Township approval for Site Plan and Subdivision Developments. Draft Plan and other Planning applications that are processed by the County of Huron are described herein. The intention of this document is that these steps, if followed will lead to a quick and simple approval that enables construction.

1.1.1 Applicable Law

Development applications are reviewed and processed in accordance with relevant legislation and regulations, including but are not limited to:

- Municipal Act
- Planning Act
- Building Code Act
- Environmental Protection Act
- Safe Drinking Water Act
- Ontario Water Resources Act

- Conservation Authorities Act
- County of Huron Roads By-laws
- Accessibility for Ontarians with Disabilities Act
- Aggregate Resources Act
- Township of Howick By-laws

Applicants must ensure compliance with these pieces of legislation and their enacting regulations as part of the development approval process.

1.1.2 Pre-consultation

Prospective applicants are encouraged to contact Howick Township Reception to schedule a preliminary discussion with the Township Planner. This discussion helps clarify key requirements and expectations early in the process. Depending on the scale and complexity of the proposal, a pre-consultation meeting with relevant staff and agencies may be scheduled before submitting a formal application.

Township staff or the Planner will coordinate this meeting, and applicants are encouraged to bring their consultants (e.g., planners, engineers) if needed. Pre-consultation helps identify key planning considerations and any required technical studies—such as traffic, noise, or servicing assessments (e.g., hydrogeology/nitrate studies).

Applicants should submit preliminary materials to the Township at least one week before the pre-consultation meeting to allow for staff review and preliminary comments. Helpful materials include:

- Concept plans
- A detailed description of the proposed development
- Specific technical or procedural questions related to the proposal

Depending on the project's complexity, the Township may require its engineer or other consultants to attend, at the applicant's expense.

Key Discussion Points

At the pre-consultation meeting, the following topics will typically be reviewed:

- *Official Plan & Zoning By-law Compliance* – If amendments or relief from policies are required, additional applications may be necessary.

- ***Application Requirements*** – This includes fees, supporting documents (e.g., contour plan, servicing plans, stormwater management), and any required agreements.
- ***Timelines & Scheduling*** – Key milestones, including next steps for the Developer and their team as well as for staff will be outlined.

Application Processing & Public Review

Once an application is submitted with all required materials, it will be reviewed by the Township Planner, Township staff, and where applicable, relevant agencies (ie. MTO, the Maitland Valley Conservation Authority, County staff, etc.) If applicable, technical studies may be subject to peer review at the applicant's cost. The application may also be circulated to other municipal departments, community organizations, and public agencies for preliminary feedback. When the submission is deemed complete, a Public Meeting will be scheduled, and notices will be sent to neighbouring property owners, in accordance with the Ontario Planning Act. The public will have an opportunity to provide input on the proposed development. Staff will work with the applicant to identify and where appropriate, address any concerns raised by agencies or the public. A comprehensive report—including draft plan conditions based on agency and public input—will be prepared by staff and presented to Howick Township Council for review and for a recommendation. The Township recommendation will then be passed on the County for their review and final decision.

Final Approval & Development Agreements

Following draft plan approval, several conditions must be met before final approval can be granted. For subdivisions, site plans, and condominiums, applicants are typically required to enter into a development agreement with the Township. This agreement addresses infrastructure requirements, such as road construction and servicing, and will require the submission of engineered drawings that meet Township standards. Plans of Subdivision require Subdivision Agreements as well as Development Agreements. Development Agreements are released, Subdivision Agreements are registered on title for perpetuity.

For further details or to begin the development application process, please contact Howick Township to schedule an initial consultation with the Township Planner and Township staff.

1.2 Planning Application Process

1.2.1 Draft Plan Approval Application

Pre-consultation shall include discussion with:

1. County Planning staff,
2. Maitland Valley Conservation Authority (MVCA) or Saugeen Valley Conservation Authority (SVCA) staff, if applicable
3. Township staff (as identified by the Huron County Planning Department)

1.2.2 Site Plan Application

Pre-consultation for Site Plan Approval includes discussions with:

1. Township staff, as identified by the Township Clerk's Department
2. County Staff, generally the Howick Planner and the County Public Works Department, if necessary.
3. MVCA/SVCA staff, if the property is within a regulated area or requires variances

1.2.3 Subdivision Agreement/Pre-servicing Agreement/Site Plan Agreement

If a significant amount of time has passed since the original Draft Plan Approval, or if a new phase of the development requires special consideration, the Planner may request an additional pre-consultation meeting before plans and reports are submitted. Developers may also request this meeting at their discretion.

1. Re-consultation meetings typically include discussions with:
2. County Planning staff
3. Township/County Public Works, Building, and Clerk staff
4. MVCA/SVCA staff, if applicable

1.2.4 Draft Plan of Subdivision/Condominium Approval

A Draft Plan of Subdivision is generally required for developments that:

1. Create five (5) or more lots
2. Establish new township roads with lots

The County of Huron is the approval authority for Draft Plans of Subdivision. The Township of Howick provides input on Township matters such as servicing and parkland dedication.

The approval process follows these steps:

1. Township Council Review – The Township reviews the proposed Draft Plan including a staff report and provides a recommendation to the County.

2. County of Huron Decision – The County of Huron reviews the application and recommendation from the Township and makes a final decision.

Throughout the process, the Huron County Planning Department (Howick Township Planner) or the Howick Deputy Clerk, generally serves as the primary point of contact for developers.

1.2.5 Application Fees

Fees for planning applications are established in the Howick Township Fees and Charges By-law. Staff will calculate the required fees and communicate the amount to the applicant. All fees must be paid before the application review process begins.

For a detailed fee schedule and payment instructions, visit the link: [HURON COUNTY PLANNING DEPARTMENT WEBSITE.](#)

1.3 Engineering Process

Following acceptance and approval of the draft plan, the developer shall proceed to the engineering phase of the development process which will include a number of submissions including preliminary and follow-up submissions as required. Prior to the commencement of the Engineering Design, the Developer's Engineer shall obtain copies of the Municipality's Development and Servicing Guidelines to familiarize themselves with the requirements of the development design in the Municipality.

The initial submission of engineering drawings shall be delivered to the Municipality and should include copies of the preliminary drawings and servicing (functional design) report(s).

The initial submission of engineering drawings shall also contain a declaration from the Developer's Engineer showing that they have been retained to design and supervise the construction of the development according to the terms of the Development Agreement. The purpose of the initial submission is to review the general design concept prior to the Developer proceeding to detailed engineering. In some cases, this information may have been provided in conjunction with the Draft Plan process. The preliminary drawing and report should consider items such as existing conditions, road alignments, cross section details, parkland dedication, trunk storm sewers, storm water management and drainage, lot grading, etc. This document becomes particularly important when servicing is to be phased in conjunction with the development plan.

When a development is being phased the servicing report is to include details of how the phasing will occur and how infrastructure may be impacted by such phasing.

The servicing report shall confirm that the servicing design does not limit future developments areas. Comments may be provided related to any

issues that are evident and the Developer will be asked to update the Engineering Drawings accordingly.

The Developer may be required to submit:

- hydrogeological, hydrology;
- Traffic;
- Acoustical;
- Geotechnical;
- Archaeological;
- biological or other studies.

Appropriate engineering or other consultants shall be retained to complete these reports as part of the applications and submissions required. The Developer's Planner and/or Engineer shall consider future adjacent land uses, and all design and layout of services shall incorporate considerations with respect to future servicing, grading and drainage issues on the adjacent lands. Upon completion of designs and submissions, sufficient copies of preliminary design briefs, agency approval submissions and all final drawings and reports shall be submitted for review by the Municipality and their Engineer.

In the event that the proposed development requires a new water treatment and/or wastewater treatment system(s) to proceed, the Developer and the Developer's Engineer shall start early discussions with the Municipality and the Municipality's Engineer, before the preliminary drawings and servicing (functional design) reports are submitted to determine design criteria and requirements.

Submissions are to be made until the Engineering Drawings, design and reports, are acceptable to the Township of Howick and the Municipal Engineer.

Additional details related to drawing requirements and approvals are provided in later sections of this document.

1.4 Development Approvals

Depending on the nature and location of the development proposal within the Municipality the developer may be required to obtain additional approvals from a number of agencies including, but not limited to the following:

- a) The Township of Howick and the Municipality's Engineer
- b) The Ministry of the Environment, Conservation and Parks (MECP)

- c) The Ministry of Transportation (MTO)
- d) The Ministry of Natural Resources and Forestry (MNRF)
- e) Fisheries and Oceans Canada (DFO)
- f) The County of Huron
- g) The Huron Perth Public Health
- h) The Maitland Valley Conservation Authority (MVCA) or the Saugeen Valley Conservation Authority (SVCA)

It is the responsibility of the Developer to provide the Municipality with written documentation detailing its application to the various authorities and copies of approval documents from these regulatory agencies.

1.5 Agreements

As noted above, the developer shall be required to enter into a Subdivision or Development Agreement with the Township. A standard form of that agreement is available from the Municipality for a developer's review. Certain fees, deposits, and charges will apply and are outlined within that document.

Information regarding the preparation of the Development Agreement is provided in Section 2.10 of this document.

1.6 Developer's Engineer

The developer shall employ Engineers registered with Professional Engineers' Ontario to design all of the services, prepare plans and specifications, and provide construction review and inspection of all works.

The services shall include the following:

- Preparation of functional reports as may be required through the draft plan approval process.
- Preparation of designs.
- Preparation of drawings for approval purposes and construction.
- Preparation of necessary contracts and specification documents.
- Preparation of necessary approval documents in conjunction with the regulatory agencies.
- Provision of contract administration, and full-time construction review of all township facilities.

- Maintenance of records of construction and upon completion, the provision of As-Recorded/As-built drawings in suitable digital format to the Municipality.
- Provision of certification to the Municipality the works have been constructed in general conformance with the approved plans and specifications.
- To act as a representative of the developer in all matters pertaining to the construction.
- To provide coordination of the scheduling to comply with timing provisions for inspections and testing of the works.
- To provide certification of the installation of services was in conformance to said plans and specifications, such certification should be in a form acceptable to the Municipality's solicitor and the Municipality's Engineer.

The Developer's Engineer shall provide evidence of professional liability insurance from their insurer in the amount of not less than five million dollars per occurrence prior to the review of any reports or briefs by the Township of Howick. Insurance requirements shall be as detailed in the Municipality's Standard Development Agreement.

1.7 Utilities

The Developer shall coordinate the design and installation of all utilities including electrical, telecommunications (telephone, internet, TV) and gas. These utilities shall be installed within the road allowance in accordance with the typical cross section attached as Appendix "A" and "B" to this document. The Developer shall provide documentation to the Municipality that he has contacted all telecommunications providers and advised them they will have access to servicing in the Development.

The Developer will be asked at times in the development process to provide confirmation from the utility companies that the appropriate arrangements have been made for installation and upon completion of said installation of the utilities, provide to the Municipality a notice of completion by said companies.

1.8 Design Standard

The standards that follow should be adhered to wherever possible. It is acknowledged that on occasion unique and special circumstances occur and minor deviations may be required from the standard. These deviations shall only be made through consultation with the Public Works staff and the Municipal Engineer. Further, the Municipality reserves the right to require compliance to a higher standard on occasions where warranted

(dependent upon the specific details of any development). Further, the Municipality may require higher standards in areas of higher density developments, arterial or collector roads, or heavy industrial traffic.

These standards should be read in conjunction with the standard engineering practice established by the MECP and MTO together with regulations, current municipal stormwater management system ECA, design manuals and standard of the Municipal Engineers' Association. Unless superseded by the Municipality's Development and Servicing Standard specific standard drawings and specifications from the Ontario Provincial Standards Specifications and Ontario Provincial Standard Drawings shall be used as reference for individual details (OPSS, OPSD).

2.0 SUBMISSION OF PLANS, REPORTS, AND STUDIES

2.1 Submission Procedure

All submissions for approval shall be forwarded to the attention of the Clerk's Department for the Township of Howick in sufficient quantities as may be required for distribution. The Clerk will distribute said plans to public works, building, planner, Municipality's Engineer, fire department, etc.

Drawing submissions shall include but not be limited to:

- a) Plan and profile.
- b) General Servicing Plan
- c) Typical cross section(s).
- d) Typical lot grading sections.
- e) Lot grading drawings.
- f) Typical swale details.
- g) Geotechnical report information.
- h) Specific structure and erosion protection and control details.
- i) Details with respect to stormwater management and associated facilities.
- j) Any other special facility required for the type of development proposed.
- k) Details of all installations not covered and noted by standard OPSD drawings.
- l) Such other environmental reports as may have been prepared as part of the application process.

2.2 Plans and Drawing Requirements

Drawings must be prepared in a digital format, which is compatible with the current version of AutoCAD, for all new development within the Municipality. The digital files and drawings, including those digital plans showing details of special structures, details, etc., shall be prepared by the Developer's Engineer and provided to the Municipality as a permanent record prior to the Final Acceptance of services required to be provided by the Developer. All digital files are to be geographically referenced in a format suitable for insertion into a geographic information system.

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

- a) Existing services shall be shown as dotted or dashed lines while proposed services shall be shown as solid lines.
- b) All elevations shown on the drawings are to be of geodetic origin.
- c) Drawings shall be of a consistent size – 594 mm x 841 mm.
- d) Scales shall be as follows for drawings:

General Servicing Plan	Scale Ratio	1:750
Plan-Profile Drawings	Horizontal	1:250
	Vertical	1:50

Ratios shall be shown on all drawings.

- e) A standard title block placed in the lower right corner of all drawings shall be used in which revisions are clearly dated and displayed, and in which the Municipality is named. A title sheet containing a drawing index shall be provided for each drawing set. A key plan at a suitable scale shall be displayed on all plan and profile drawings as well as the General Servicing Plan. The area covered by each specific drawing shall be identified in the key plan.
- f) All engineering drawings shall be stamped and dated by the Developer's Engineer prior to issuance for tender.
- g) Upon completion of the works, As Recorded drawings, as outlined elsewhere in these specifications, shall be submitted prior to acceptance of the services. These drawings shall be comprised of the original drawings that were issued for construction, amended to incorporate any changes implemented during construction.

2.3 Plan-Profile Drawings

Plan-Profile drawings are required for all roads, blocks and easements where services are proposed, for all outfalls, and for all boundary roadways abutting the development. The following standards shall be adhered to in the preparation of Plan-Profile drawings:

- a) All profiles must be drawn with reference to the geodetic datum (NAD83) noted on each drawing. All drawings must contain a complete legend.

- b) Drawings are to be prepared so that each street can be filed separately. The street names must be identified on the plan portion of the drawings.
- c) In general, east-west streets shall have zero chainage at their westerly limits and north-south streets shall have zero chainage at their southerly limits. Chainages shall increase from left to right. On the plan portion of each drawing the centerline of construction shall be noted with chainage in 20 metre increments. Chainage for the centerline of construction as well as the chainages for vertical curves (i.e. beginning, end, and apex points) shall be noted on the profile portion of each drawing.
- d) When the plan must be broken because of curvature, etc., the profile shall be broken as well, so that, insofar as possible, chainage points in plan and profile will coincide vertically. When a street must be displayed on more than one drawing due to its length, match lines shall be used with no overlapping of information.
- e) The beginnings and ends of curves must be shown on the plan and profile with the radius of curvature shown on the plan. Chainages of points of curvature shall be calculated.
- f) The chainage and names of intersecting streets shall be shown in plan and profile, and the reference drawing numbers for these streets and for any match lines shall be shown on all applicable drawings.
- g) The drawings shall show clearly the proposed profiles, road widths and cross-sections, ditches, ditch gradients, curb gradients if different from the proposed services, north arrow and limits of the proposed work. The plan shall show any required off-street drainage, and separate profiles shall be prepared for drainage easements. All details for intersecting streets including grades must be shown for a distance of 50 metres from the intersection of the intersecting street. All street lines, for drainage or services, shall be shown and all easements.
- h) Plan-Profile drawings shall identify road allowances, lot and block frontages, easements, and reserves. The curb, gutter, and sidewalk are to be shown and dimensioned on the plan portion of the drawings.
- i) Storm sewer shall be drawn in both plan and profile. In profile, the diameter of the sewer shall be drawn to scale. On the plan portion, sewers shall be described by size, type, and direction of flow. On the profile portion, the length, grade, pipe material and class, usage (storm) and bedding type shall be identified.

- j) Structures associated with sewers (i.e. maintenance holes, catch basins) shall be numbered and drawn on both the plan and profile portions. On the profile portion, the number, offset, size, invert elevations, and applicable OPSD shall be identified for each structure. Safety platforms or drop connections shall be noted on the profile portion where applicable. Top of grate elevations shall be specified for rear lot catch basins.
- k) Ditch profiles and grades shall be shown.
- l) The original and proposed ground profiles shall be plotted. Proposed vertical curves shall be defined by all relevant data (K value, grade, etc.). Proposed roadway profiles shall be displayed sufficiently beyond the limits of construction to confirm the feasibility of future extensions.
- m) Details of gutter grades for cul-de-sacs and crescents shall be provided on the plan portion as a separate detail at a scale of 1:100.
- n) Existing utilities and services shall be shown in plan.
- o) The following additional information shall be shown in plan:
 - Curb radii at all intersections;
 - Location of luminaire poles and transformers;
 - Location and type for all street name and traffic control signs
 - Any special notes related to construction procedures or requirements.

2.4 General Servicing Plan

A copy of the General Servicing Plan shall be submitted to the Municipality identifying the proposed locations of telecommunications, electrical servicing, and gas mains, as well as storm sewers. 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 Municipality's Typical Cross-Section. The drawing should also display lot and street boundaries and dimensions in accordance with the Registered Plan for the area. Geodetic (with reference to the NAD83 vertical datum) and site benchmarks should also be identified. If applicable, flood lines specified by the local Conservation Authority should be displayed.

2.5 Approvals and Acceptance

2.5.1 Ministry of Environment, Conservation and Parks (MECP) and Conservation Authority Approvals

The Consulting Engineer shall obtain a Certificate of Approval from the Ministry of the Environment (MOE), and if applicable, approval

from the Maitland Valley and/or Saugeen Valley Conservation Authority prior to commencing construction.

2.6 Other Acceptances

The Developer's Engineer is required to make all submissions and representations necessary to obtain acceptances from all other authorities affected (Ministry of Natural Resources and Forestry, Ministry of Transportation, Conservation Authorities, Source Water Protection Authority, Canada Post Corporation, Fire Marshall, Medical Officer of Health, etc.).

The Municipality shall be kept informed of the progress of these submissions by way of copies of all correspondence.

2.7 Final Approval of Submission

After the Municipality is satisfied that they have completed their review of submission of drawings and have documentation from the Developer or their Engineer that all other regulatory agencies have been satisfied with their approval submissions, the Developer shall submit to the Municipality final copies of drawings and specifications in quantities the Municipality may determine sufficient which shall include all details required by the Municipality and the approval agencies.

Any changes subsequent to this submission which may be proposed by the Developer or their engineer must be resubmitted to the Municipality for review and for their approval prior to such changes being made in the installation of services. If one year has passed since the date of the acceptance of the drawings by the Municipality and the Developer has not yet entered into Development Agreement with the Municipality, the Municipal Engineer reserves the right to revoke any or all acceptances related to the engineering drawings.

2.8 Services for Individual Residential Lots

Services for individual residential lots or units shall generally be as follows:

- Telecommunications (Telephone, cable TV and internet) and electrical services shall be installed in a common trench
- Driveways shall be located on the opposite side of the lot from pad mount transformers, streetlights, or perpendicular intersecting roads
- Gas

2.9 Easements

Where buried services, utilities, channels, overland flow routes, etc., are placed outside the road allowance, permanent easements will be required. The widths of the easements shall be determined through consultation with the Municipality. In general, the buried infrastructure shall be placed in the centre of the easement.

2.10 Preparation of Development Agreement

The draft of the Development Agreement will be prepared by the Municipality. The Developer's Engineer shall prepare a servicing cost estimate for review and inclusion in the agreement related to securities. The Municipality's Clerk must be in a position to clear all conditions of the Draft Plan Acceptance prior to the preparation of the draft Development Agreement Schedules. The following information must be provided by the Developer's Engineer to the Municipality prior to the preparation of the draft Development Agreement Schedules:

- MECP certificates of acceptance for all the services to be constructed if available.
- The name of the person and/or company with whom the Development Agreement will be executed.
- The name, address and telephone number of the developer's lawyer.
- One hard copy and an electronic copy of the Reference Plan
- One hard copy and an electronic copy of the Legal Description based on the Reference Plan, including but not limited to, easements, reserves and daylighting.
- One hard copy and an electronic copy of the proposed final plan for future registration complete with all the pertinent information as required by the registry office. The plan shall show all required lots, blocks, and easements.
- One hard copy and an electronic copy of the accepted engineering drawings.
- A detailed cost estimate of all services to be constructed. This estimate will form the basis for calculation of security to be posted for this development. It shall include:
 - Detailed cost of services;
 - Cost of underground electrical distribution and street lighting (where not part of a separate agreement with the utility);
 - All miscellaneous expenditures;
 - Allowances for contingencies, engineering, and HST.
- Proposed timetable for construction of services reflecting phasing.
- Proposed landscaping plans where necessary or required.

2.11 Requirements Prior to Commencement of Construction

Following signing of the agreement, receipt of the insurance certificate, receipt of security deposit (i.e., Letter of Credit), and at least two weeks prior to the commencement of construction, the Developer's Engineer shall submit the following information to the Municipality for acceptance:

- Two sets of construction specifications;
- A list containing the Contractor, subcontractors and the Contractor's material suppliers;
- A copy of the signed contract tender complete with prices;
- Proposed disposal sites;
- Insurance documents;
- Project schedules;
- Spills Action plan;
- Any other information as required by the Municipal Engineer or as specified in the Development Agreement.

In addition to the above items, the Developer's Engineer must provide confirmation that all recommendations of the Erosion Control plan are implemented. The Developer's Engineer must schedule a pre-construction meeting and provide sufficient notice of this meeting to the Municipality.

2.12 As Recorded Drawings and Record Field Survey

The Developer's Engineer shall retain a record of all revisions to the design that were implemented during construction. These "record revisions" shall be based on a final survey of the development. The final survey shall include a check of the following items:

- Location and invert elevations of all sewer maintenance holes
- Distances between all sewer maintenance holes
- Location of all roadway catch basins
- Location, rim and invert elevations for all year yard and lot catch basins
- Road centreline elevations
- Site benchmarks

The original drawings shall be revised to incorporate all changes and variances found during the final survey and to provide ties and additional information to readily locate all underground services. These new amended drawings shall constitute the As Recorded drawing set.

The As-Recorded drawings shall display all sewer and road grades recalculated to two decimal places. All street names, lot numbering and block identification shall be checked against the Registered Plan and corrected if necessary. An As Recorded revision note shall be placed on all drawings in the revision block.

At any time up to two years after Final Acceptance of the development, the Municipal Engineer may return the As Recorded drawings to the Developer's Engineer for rechecking and further revision if discrepancies are found. The Developer's Engineer shall be required to explain in writing any major difference between the design and the As Recorded data to provide verification that the alteration does not adversely affect the function of the development services.

A paper and electronic copy of the As Recorded drawings must be submitted to the Municipality for review before "Final Acceptance" of the development will be given.

The Development Agreement shall be referred to for the definition of "Final Acceptance".

3.0 ROADS

3.1 General

All local roadways for residential development shall be designed and constructed to the urban standard and the typical cross section shown in Appendix “A” to this document. Road allowances shall be a minimum of 20 metres wide. The edge of the roadway paved surface shall have a minimum radius of 9 metres at intersections. Access roads not owned by the Municipality, leading to the area of the development, shall be constructed and maintained to a standard equal to the standards for roadways within the development. On all streets, horizontal and vertical sight distances and vertical curves shall meet Ministry of Transportation (M.T.O.) Geometric Design Standard.

Road allowances on cul-de-sacs are to have a minimum radius of 20 metres. Edge of pavement radius on cul-de-sacs are to be a minimum of 15 metres.

For urban cross sections, the minimum road asphalt width shall be 8.5 metres. The finished roadways shall have a crossfall of 2% from the centerline to each curb line.

Should the development require the construction of arterial or collector roads, the Municipality will establish design widths for that section of road if required.

All roadways for new industrial development shall be designed and constructed to the urban standard as shown in Appendix “A” to this document. Road allowances for industrial development shall be a minimum of 26 metres wide.

Where a semi-urban or rural road cross section is allowed, design standards are attached as Appendix “B”

A qualified geotechnical firm shall be engaged by the Developer’s Engineer to confirm the suitability of the minimum pavement designs contained in these standard for use in the Development, or to recommend a higher standard if required. The same geotechnical firm shall be retained by the Developer’s Engineer to carry out field testing during construction to verify the design.

Copies of all test results and proposed road designs shall be submitted with the engineering drawings. Testing and acceptance of all granular materials at the designated pits prior to placement and subsequent in-situ verification tests shall also be performed by the Developer’s geotechnical firm.

Prior to the placement of asphalt pavement, the Developer’s Engineer must submit to the Municipal Engineer for acceptance, the asphalt pavement mix designs.

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

3.3 Grading

A 2-metre boulevard area behind the curbs and/or sidewalk (as applicable) shall be graded at a minimum of 2% and maximum of 5% towards the curbs. Where the proposed road extends through areas of cut and fill, the area from the edge of the road boulevard to the street line shall be graded with a side slope not exceeding a slope of 3 metres horizontal to 1 metre vertical to meet the original ground. All side sloped ditches and boulevards to the street line shall be protected with nursery sod over a minimum depth of 100 mm of topsoil.

In all cases, topsoil shall be stripped for the complete width of the road allowance and stockpiled at locations accepted by the Municipal Engineer. Rough grading shall be done to bring the travelled portion of the road to the necessary grade and in conformity with the cross-section shown on the drawings. All subgrade material shall be compacted to 95 percent Standard Proctor Density prior to any application of granular base course materials.

Rough grading of all lots and easements must be properly shaped to ensure suitable drainage.

3.4 Road Construction

All road construction shall conform to applicable standards of the Ontario Provincial Standard Specifications (OPSS) and the Ontario Provincial Standard Drawings (OPSD). The granular road base shall consist of a bottom course of 450 mm minimum depth consolidated Granular “B” full width across the roadway and a top course of 150 mm of Granular “A” full width between concrete curbs. The granular materials shall be spread in layers of 150 mm maximum compacted depths, and each layer shall be thoroughly compacted. During and between construction seasons, the granular base shall be maintained suitable for vehicle and pedestrian traffic, including dust control by calcium chloride and renewed if required to the satisfaction of the Municipal Engineer.

Road subdrains shall be provided as required in accordance with OPSS 405.05 and amended to accept only polyethylene Big “O” Boss 2000 or equivalent. The subdrain shall include filter wrap (non-woven type) in accordance with OPSS 1860. The Municipality reserves the right to require video inspection of subdrains prior to acceptance.

3.5 Roadway Surface Asphalt

As soon as the granular base has been completed, it shall be thoroughly compacted and shaped, and the base course of asphalt placed (if practical and if with approval from the Municipality). The base course shall consist of 50 mm minimum thickness of HL-4 Base Course Asphalt.

Following at least one year from the date of placement of the base asphalt, the Developer shall arrange an inspection with the Municipality to discuss any remedial work that may be required prior to placing the surface coat of asphalt. Not sooner than one year following the completion of any remedial works and as dictated by the Development Agreement shall the surface coat of asphalt be placed consisting of 40 mm minimum thickness of HL-3 Surface Course Asphalt.

Asphalt work shall conform in all respects to OPSS 310.

3.6 Curbs

Concrete curb and gutter, of cross-section approved by the Municipal Engineer, shall be provided along all edges of paved roadway surface. Terminations at the limits of the subdivision shall be either joined to existing concrete curbs or rounded to reduce hazard to traffic.

Construction shall conform to OPSS 353.

Driveway depressions shall be formed in the curb according to OPSD 351.010. The maximum width shall be 10.0 m. If a driveway location cannot be determined at the time of pouring, a full section of curb and gutter shall be poured continuously. When the driveway location is determined, a driveway depression can be cut with a curb cutting machine providing the section to be cut is free from cracks and other defects. The Municipality reserves the right to request semi-mountable curb and gutter where

they deem it appropriate. All curb and gutter is to be protected from damage by heavy equipment and vehicles. Two stage curb is not permitted.

3.7 Sidewalks

A 1.5 metre sidewalk shall be constructed on one side (minimum) of each street within the development. Sidewalks shall have a minimum depth of 125 mm and shall be bedded in granular in accordance with the current OPS standard details. On arterial or collector roads, sidewalk shall be placed on both sides of the road. The sidewalks shall be increased in thickness from 125mm to 150mm at all driveway locations, and 200mm for commercial or industrial driveways. Granular depth shall be 150mm minimum or increased to the same depth as the sidewalk or drive where installed thicker.

Sidewalks shall be placed prior to construction of asphalt, concrete or brick driveways.

3.8 Accessibility

As part of construction of any concrete curb and gutter, sidewalks or other surface structures, the Developer will be responsible for construction of all Works in accordance with the Municipality's and the Province of Ontario's current accessibility standards and regulations to provide full access where possible, to all individuals in the community.

3.9 Turning Circles

Where construction is phased, the Municipality may require the installation of temporary turning circles. These turning circles will be constructed in accordance with the requirements for cul-de-sacs in Section 3.1 of this Schedule. Temporary cul-de-sacs shall be paved and curb and gutter shall be provided when needed to contain surface water and direct it to the storm sewers.

3.10 Adjacent Roads

Whenever a development abuts adjacent roads, improvements to those roads and the installation of all municipal services shall extend to the limit of the property owned by the Developer.

3.11 Daylighting Requirements at Intersections

Where deemed necessary by the Municipality, daylighting at intersection quadrants shall be included in the road allowances to provide for uniform boulevard widths. When required, daylighting details (location, and size) shall be included on the proposed plan for Registration and on all engineering drawings.

3.12 Location of Utilities

The location of utilities within the road allowance shall be as detailed in the Municipality's standard drawings. Utility drawings shall be submitted to the Municipal Engineer for acceptance of the proposed utility locations. All utility wiring is to be housed underground or directly buried.

Hydro transformers are to be housed in suitable enclosures and mounted on transformer pads installed at the final elevation of the adjacent ground. The location of transformer pads shall be as detailed on the Municipality's standard drawing and are typically to be in the opposite boulevard of the sidewalk. Telecommunications and cable T.V. junction boxes may be mounted at the surface in accepted standard enclosures.

3.13 Community Mail Box Requirements

Community mail centres and/or site individual super mail boxes shall be placed in locations accepted by the Municipality. Community mail centres shall be constructed centrally and suitably located in consultation with the Canada Post Corporation. The design of the community mail centre must incorporate such criteria as pedestrian safety, traffic flow and aesthetics.

The Municipality may require the developer to furnish the following amenities within the community mail centre:

- Park benches
- Fencing
- Litter containers
- Landscaping
- Pedestrian lighting
- Concrete pad or interlocking stone surface
- Architectural controlled kiosks
- Adjacent car bays parallel to the travelled portion of the roadway.

All details associated with the community mail centres or super mail boxes shall be identified on the Engineering Drawings and will be subject to review by the Municipality. The Developer shall be responsible for constructing community mail centres within residential developments, prior to the issuance of the first building permit.

The acceptance of Canada Post Corporation with respect to location of community mail centres and/or site individual super mail boxes will be required prior to the acceptance of the Engineering Drawings by the Municipal Engineer.

3.14 Snow Clearing

Snow clearing operations prior to “Final Acceptance” may be carried out by the Municipality if so requested in writing by the Developer; the associated costs will be charged back to the Developer.

3.15 Driveway Entrances

Driveway entrances shall be constructed to the property or to the edge of sidewalk. Entrances shall have a consolidated base constructed of 300 mm minimum depth of Granular “B” and 150 mm minimum depth of Granular “A”.

All entrances shall be hard surface (asphalt, concrete, or similar material). All entrances shall be completed in accordance with the current OPS

standard details. Refer to the Township of Howick's Entrance Permit for fees and further information.

Allowable Township Entrance widths:

- Max 10 meters for residential or field – Minimum of 5 meters
- 15 meters for farm
- 20 meters for commercial, institutional or industrial

Any entrances required off a County of Huron highway will be applied for and approved by the Huron County Roads Department.

3.16 Other Requirements

Whenever it is necessary to cut through an existing municipal road, the Contractor will be responsible to obtain a permit from the Municipality. The placement and compaction of the backfill material and the restoration of the surface pavement shall be done in accordance with the standard and specifications in effect at that time.

Before making detours, permission is required from the Townships Public Works Department. Where the road is not part of the municipal road system, acceptance from the appropriate road authority will also be necessary. In all cases, the fire, police departments, school bus companies and ambulance service must be notified by the Developer or their Contractor.

All work will be done in accordance with ordinances and By-laws of the Municipality

4.0 STORM DRAINAGE/STORMWATER MANAGEMENT

4.1 Approval of Design and Plans

Storm sewers shall be provided to serve the whole of the development. Drawings shall consist of an overall plan, a plan and profile of each storm sewer, drawn to the same scale as the roads, pipe bedding, Maintenance holes, and other appurtenances. Design (including all drawings and calculations) of the proposed works must be submitted to the Municipal Engineer and applicable government agencies for approval. For most additions and alterations to the municipal stormwater management system, where an ECA is not required, the Developer's Engineer shall provide a complete MECP Form SW1 - Record of Future Alteration Authorized for Storm Sewers/Ditches/Culverts and where needed, a complete Form SW2 - Record of Future Alteration Authorized for Stormwater Management Facilities, with all supporting information and calculations.

If required, plans of the entire system shall be submitted to the Ministry of the Environment for approval. Approval for construction will not be given until all Environmental Compliance Certificates have been received from the Ministry of the Environment, Conservation and Parks and all other applicable government agency approvals have been received.

4.2 Stormwater Management Report

A Stormwater Management Report setting out the existing and proposed drainage pattern shall be submitted to and approved by the Municipal Engineer, the Maitland Valley Conservation Authority or Saugeen Valley Conservation Authority and the Ministry of the Environment, Conservation and Parks. Should the development be of a size or location that the Conservation Authority has no requirement to regulate the stormwater management criteria, or in the event that specific design details are not provided by the Conservation Authority, the standard in Appendix "C" shall apply.

The stormwater management requirements within the Municipality shall be those of the local Conservation Authority or as listed below in the general requirements:

- Quality and quantity control – as dictated by the local Conservation Authority and/or the MECP. Quantity control shall restrict post-development runoff flows to pre-development flows between the 5 and 100 year / Regional storm events
- The design storm for the minor systems shall be the 5-year storm for local storm sewers and the 10-year storm for trunk facilities. The major system shall be designed to convey the Regional storm.

- Sediment and erosion control measures associated with the stormwater management requirements shall be identified on the drawings for works to be included during the construction and for permanent measures.

4.3 Connection to Municipal System

The storm sewers shall be connected to the municipal storm sewer system (where feasible) or discharged to a natural watercourse as approved by the Municipality, Conservation Authority, and the Ministry of the Environment, Conservation and Parks.

Connections to Municipal Drains will be reviewed by the Drainage Superintendent for the Township of Howick and the process to complete alterations will be completed as regulated through the Drainage Act.

4.4 Design Criteria

The stormwater management system shall be designed by using MIDUSS (current version) or an alternate approved hydrologic model. The Developer's Engineer shall consult the Conservation Authority as to the appropriate storm distribution and duration to be used. The Developer's Engineer shall advise the Municipal Engineer in writing as to the Authority's requirements. The Developer shall ensure that the Municipality is aware of any requirements that the Conservation Authority may have so that they can be reviewed, discussed, and revised should the Municipality deem it necessary. The design of the stormwater management system shall be in accordance with the following:

- Appendix "C", Section A – Storm Drainage and Stormwater Management;
- Latest version of the "Stormwater Management Practices, Planning and Design Manual" and "Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alternations Authorized under Environmental Compliance Approval", as prepared by the Ministry of the Environment, Conservation and Parks.

4.5 Location

The storm sewer shall be located under the gutter line, with lateral connections to catch basins located within the curbing

4.6 Semi-Urban Developments

Notwithstanding that it is the policy of the Township to require curb and gutter on all new streets found within the settlement areas of the Township, the municipality may consider reducing the municipal standard for new

developments abutting existing developments that have been developed to semi-urban standards.

This special relief will require a Council resolution and Developers are encouraged to obtain Council approval early in the development process. As a guide to Developers, Council will consider the following factors in granting this exemption:

- Specific locations designated in the Official Plan to permit Residential Development in non-urban settings.
- The relative size of the proposed development and other adjacent lands that are designated for residential development in the Official Plan. The smaller the new development is in comparison to the neighbourhood; the more likely semi-urban development will be permitted.
- The size of the lots. Generally, estate size lots (frontages of 30 meters or more) are candidates
- The adequacy of downstream storm sewer outlets. Less than desirable storm sewer outlets support semi-urban construction

Development in the Township may provide for a storm sewer service. Where a storm sewer service is proposed, the service connection will be done in accordance with Municipal Standards. All other sump pump discharges shall be located on dwellings to ensure discharge is not directed to adjacent property. Grading and splash pads shall be used to direct sump pump discharge to the front or rear yard via swales. Sump pump discharge pipe locations shall be noted on the residential lot grading and drainage plan.

The Consulting Engineer shall confirm the availability and location of an appropriate outlet with the Township and shall complete the final design and obtain a Certificate of Approval from the Ministry of the Environment, Conservation and Parks (MECP) prior to construction. Work on private property shall conform to the Ontario Building Code.

All pipes shall be laid and maintained in straight alignment and grade. At no point shall the pipe deviate by more than 0.05% horizontally or vertically from the straight alignment. All structures are to be placed within 75mm horizontally of the design location. Should it deviate by more than these amounts it shall be removed and reinstalled.

Blind connections are not preferred.

Adjustment and final setting of catch basin frames shall be completed by pouring concrete, or using concrete riser units, immediately prior to the placement of the top lift of asphalt. Riser units shall be parged on the outside of the catch basins only. Catch basins shall be initially set to base asphalt elevation. Temporary asphalt curb shall be placed at catch basins between the preliminary acceptance and final acceptance stages of the development.

4.7 Rural Development – Ditches and Culverts

If approved by the Township, drainage may be permitted with the use of ditches and culverts. Generally, however, all residential subdivisions shall be constructed with storm sewers and curb and gutter.

Ditches and culverts shall be sized and protected to take the total expected storm runoff calculated by a recognized engineering method such as the Rational Method.

The structures shall be designed to carry A.A.S.H.O. H20-S16 truck loads.

Design Criteria for ditches and culverts:

Minimum Culvert Diameter	450 mm diameter.
Culvert Material	standard galvanized corrugated pipe, pipe-arches, HDPE
Culvert Thickness	minimum 2.0 mm steel or PS320 for HDPE
Culvert Cover	minimum 450 mm Granular "B" and 200mm Granular "A"
Ditch slopes	Max 3:1 Preferred 4:1
Ditch Grade	Min 0.5% Max 6% Preferred 1%

Minimum ditch protection shall be 75 mm of topsoil on the bottom and side slopes and seeded.

Culverts shall be bedded and backfilled with acceptable native or granular material in accordance with Ontario Provincial Standard Specifications and Drawings. 1% grading for sandy soils, and 2% for silt or clay soils.

Culverts shall have the ends protected with gabions, rip-rap, asphalt or concrete or metal headwalls when directed by the Township.

Ditches sloped less than 1% will require a subdrain to be installed under the invert of the ditch.

Large diameter culverts (Greater than 450mm dia. shall be of reinforced concrete or corrugated metal.)

4.8 Sewer Pipe Material

Sewer pipe material shall be:

-
- a) Concrete Sewer Pipe (Rigid)
 - 250 mm non-reinforced Class 3 – CSA certified to A257.1
 - 300 mm or greater reinforced as specified in the tender form – CSA certified to A257.2
 - b) Polyvinyl Chloride (PVC) Pipe (Flexible)
 - Class SDR 35 or Class V (320 kPa)
 - Annular ribbed profile for ripped pipe
 - c) Polyethylene Sewer Pipe (Flexible) – CSA certified Sewer Class to B 182.6
 - 300 mm to 750 mm
 - smooth inner wall, annular corrugated profile (320 kPa), 15 PSI bell and spigot joints shall have elastomeric gaskets (CSA certified to B 182.6)

The minimum size, including catch basin leads, shall be 300 mm. The Municipality may require a larger storm sewer size on parts of the subdivision than required for the subdivision alone.

4.9 Storm Sewer Construction

Storm sewer construction and pipe bedding shall conform to the requirements of the Ontario Provincial Standard Specifications for sewer construction. Pipes shall be bedded in approved granular materials.

Catch basin leads shall be connected to the main sewer with a maintenance hole except where the main sewer size exceeds 450 mm diameter, in which case the lead can be connected directly to the main sewer using a factory manufactured “Tee”.

4.10 Maintenance Holes and Catch Basins

Concrete maintenance holes shall be provided at all changes in direction of the sewer and at all street intersections, with maximum spacing on straight runs as noted:

Sewer Diameter (mm)	Maximum Spacing (m)
300 to 975	110
1050 to 1350	130
1500 to 1650	160
1800 and above	305

Maintenance holes shall be 1200 mm diameter or larger, conforming to OPSD Series 700. Benching shall be provided in all maintenance holes. Catch basin maintenance holes shall contain a sump or minimum depth of 300 mm below lowest invert on sewers up to and including 600 mm diameter.

Frames and covers shall be OPSD 401.01 Type A, or approved equal, set on not less than three

(3) layers nor more than six (6) layers modoloc pre-cast units, which shall be parged on the outside face. Adjustment units shall conform to OPSD 701.010.

Catch basins shall be provided on both sides of the street at all low areas with the maximum spacing as noted:

Road Gradient (%)	Maximum Spacing (m)
0 to 3	110
3.1 to 4.5	90
Over 4.5	75

Catch basins for depth up to 2 m from ground level to invert shall be 600 mm square concrete conforming to OPSD 705.01. For greater depths, catch basins-maintenance holes shall be used conforming to OPSD 701.03. Frame and grates shall be OPSD 400.110.

5.0 UTILITIES AND STREET LIGHTING

5.1 Telecommunications

Telecommunication services, which include telephone, internet, and television, shall be provided and installed in a corridor at the location provided in the typical cross section. The Developer must bear the cost of any surcharges for underground installation made by the provider(s) and must grant them any easements for their services. Where requested by the Municipality, spare conduit(s) for future services will be provided as part of the telecommunication installation.

5.1.1 Telecommunication Companies

There are several telecommunication companies that may have interest in providing installations. The developer shall ensure that all can be installed and shall provide service. The developer shall provide to the Municipality documentation, satisfactory to the Municipality that all such companies have been contacted and offered the opportunity for installation.

5.2 Electrical

Underground electrical installation shall be completed to the satisfaction of the local power supplier based on their most current specification.

5.3 Gas Servicing

Developers shall ensure that a corridor is provided for the future installation of gas distribution mains and services throughout the subdivision. Should, within the time that the development is being serviced, gas supply is available, then the developer shall arrange for its installation.

5.4 Street Lighting

All developments shall be provided with adequate street lighting in accordance with current utility or Township of Howick standards. The materials and suppliers will be reviewed with the Municipality prior to design, approval of materials, installation, and where appropriate, shall be sourced from suppliers for which the Municipality currently has luminaires in service.

For decorative lights and poles, an arrangement shall be made with the Municipality to provide for stocking of spare poles, lights and accessories to the satisfaction of the municipality for the initial operation and repair of the street lighting system.

The minimum street lighting requirements are as follows:

- Fixtures will be LED. All fixtures shall have individual photocell control, and photocells shall have proven 25-year life expectancy and a warranty satisfactory to the Municipality (20 year unless agreed to otherwise).
- Poles shall be one piece concrete or aluminum. Concrete poles shall be direct burial. Aluminum poles shall be installed on an adjustable frangible base. Poles shall be of sufficient height to ensure a minimum vertical separation from the road surface to the luminaire, of 6 metres.
- The tenon size on pole and fixture must match. Power feed shall be completely underground. The lights shall generally be placed to the outside of curved roads.
- The maximum allowable spacing along the street, between the lights, shall be 35 metres. Increased pole spacing may be considered if photometric modelling is performed and the RP-8 standards are achieved. In all cases, the lighting design shall meet IESNA RP-8 standards for Type III distribution. The poles must be installed at the location as shown on the Municipality's Typical Cross-Section. Particular care shall be taken to adequately illuminate the intersections and cul-de-sacs. Preference to have poles located along lot lines if possible.

Amendments to this standard are at the Township's discretion/direction and the developer and their engineer are to review the materials specifications with the Township in advance of proceeding to the design stage for the lighting.

Street lighting requirements for collector and arterial roads shall be reviewed with the Township prior to design

6.0 LOT GRADING AND DRAINAGE

As part of a submission with the servicing drawings, an overall lot grading plan shall be provided to the Township. Existing ground elevation contours shall be shown with not greater than 1 m intervals and spot elevations shall be located along lot lines adjacent to the development.

Further, spot elevations shall be shown a minimum of 30 m beyond the limit of the development to provide an indication of the adjacent grading.

Section B of Appendix “C” should be referred to for specific standards related to lot grading, however, the general requirements are as follows:

The lot grading plan to be provided shall include proposed finish grade elevations and details as follows:

- All lot corners.
- All changes in grades.
- Along the centreline of the road at 20 m intervals.
- On all building sites, elevations adjacent to foundations, retaining walls or changes in elevation.
- Ditch or swale bottoms.
- All intersecting lot lines.
- Any location where the grade changes in slope.

Lot grading drawings shall include directions of both minor and major overland flow routes with arrows on drawings.

These drawings shall be provided together with stormwater management reports and stormwater management facility drawings to provide information suitable for the Building Official to review individual site-specific grading plans.

Any regional flood, fill lines or erosion control lines shall be shown on the lot grading plans to the satisfaction of the Conservation Authority.

The Developer shall note that the review and approval of a lot grading plan by the Municipality does not provide assurance that a specific style of house will suit an individual lot and applications for building permits must provide for a dwelling unit that suits the style of grading proposed by the Developer.

General lot grading standards are as follows:

- Lot grading is 2% minimum, 6% maximum.
- Driveways – 2% minimum, 6% maximum.
- Drainage Swale – 2% minimum, invert slope – 0.3 m minimum depth, 4:1 maximum side slopes.
- Terraces or Changes of Grades shall be at a slope no more than 3:1.
Where there are terraces or retaining walls proposed, a horizontal area a

minimum of 2 m in width, shall be provided at the extent of each change in grade before terrace slopes are proposed.

7.0 PARKLAND AND LANDSCAPING

7.1 Parkland

Where park areas are dedicated to the Municipality as part of the development, the Developer shall grade and seed the parklands so that they are suitable for recreational use. Grading shall be to a minimum slope of 2% and appropriate drainage swales and outlets shall be provided to the municipal sewer system or to an appropriate outlet. The requirement for fencing or further landscaping of a park area will be reviewed with the Developer at the time of Draft Plan submission along with the location and geometry of a proposed park.

Stormwater management facilities and environmentally sensitive areas are not to be considered appropriate for parkland dedication.

7.2 Landscaping

Boulevards shall be finished with a minimum of 100 mm of topsail and shall be sodded or seeded.

At least one tree shall be planted in the boulevard in front of each lot (single family or semi-detached) generally within one year of the completion of the curb and gutter and paving in that section of subdivision. On corner lots, a second tree will be required on the flankage. Trees are to be planted so as not to interfere with other street functions or services when the tree matures. Trees shall be planted in the boulevard, generally opposite the driveway on any lot and not interfering with municipal services.

Trees shall at a minimum be 60-70 mm dia. measured 300 mm above the ground and shall be No. 1 nursery stock. The Township maintains a list of current species of trees acceptable for use in new development and the Public Works Manager shall be consulted to designate species at the time of planting.

Tree planting and care procedure shall include the following:

- Check for underground services of: hydro, wells, septic's, phone and cable by obtaining locates.
- Dig holes with appropriate equipment. Holes shall be 250 mm wider in circumference and the same depth as the root ball.
- Loosen, untie and fold down burlap and rope from tree trunk and place in hole. Place root ball in the centre of hole and ensure that the top of the root ball is flush with surrounding terrain.
- Backfill with native soil. Adjust if necessary and pack the root ball firmly.

- Add a Mulch ring at a depth of 10 cm (4") at the base of the tree keeping the Mulch from touching the trunk directly. Termite resistant mulch shall be used in the Termite Zone.
- Stake tree for two years using rubber garden hose to protect tree from being cut by support wires
- To protect the trunk from line trimmers where mulch is not used - use a 20 cm (8") section of solid drainage tile.
- Water newly-planted trees regularly during the first year
- Remove stakes from trees after 2 years or if tree is in a windy location postpone stake removal for 2 more years adjusting the wire and hose accordingly
- Top up mulch ring as required on yearly basis.
- Use care when grass cutting or when using a line trimmer at the base of the tree ensuring the trunk is not struck.

All trees that die or fail to grow (as per the discretion of the Township) prior to "Final Acceptance" shall be replaced by the Developer.

7.3 Walkways

Walkways shown on the Plan of Subdivision shall be constructed between parkland and adjacent streets or from street to street. They shall consist of a concrete sidewalk of minimum width of 1.5 m. The walkway boulevard shall be landscaped, topsoiled and seeded. A standard 1.5 m high chain link fence shall be placed along both sides of the walkway right-of-way with bollards placed at each end of prevent vehicular traffic from using the walkway.

7.4 Trails/Pathways

Walking Trails or Pathways are a mechanism to provide conductivity within newly created subdivisions and existing sections of the urban settlement or existing parks and trails. The Developer will look as to how to bring accessible pedestrian connectivity to the neighborhood.

8.0 TRAFFIC AND STREET SIGNS

The Developer shall be responsible for erecting all traffic and street name signs within the development. These signs may be provided by the Municipality at the Developer's expense. The Developer shall further be responsible for providing lot identification signs on each lot outlining the appropriate municipal address (911 address) for said lot.

9.0 ASSET MANAGEMENT

Prior to Final Acceptance of the services as defined in the Subdivision or Development agreement, the developer shall engage their Engineer to provide to the Municipality a detailed list of the cost of all of the assets for the purpose of the Municipality's asset management system.

10.0 PAYMENT TO DEVELOPERS

The Municipality shall not be liable for any costs arising out of the construction of services except the oversizing of the works are required for future development.

The Municipality will pay the marginal cost of any requested oversizing of stormwater collection works and appurtenances beyond an increase in one nominal pipe size above that which might be needed for the development.

For example, where a sanitary sewer (or a watermain) designed solely for the development might require the developer to install a 250 mm dia. pipe, a request for oversizing beyond one pipe size or 300 mm would result in the Municipality paying the marginal cost.

Where a storm sewer is requested that is larger than that required for the development and any offsite flows (based on their current developed state), the Municipality will pay the marginal difference in cost for supplying the larger size pipe and appurtenances beyond one incremental pipe size of that needed.

11.0 REVISIONS TO SERVICING STANDARD

The Township reserves the right to amend these standards at any time and/or to further clarify the requirements found herein.

12.0 DEFINITIONS

The following definitions shall apply:

“Township” shall mean Township of Howick.

“Developer” shall mean the Owner or party specifically named in a Development Agreement or in a Subdivision Agreement.

“Developer’s Engineer and/or Consulting Engineer” shall mean professional engineer(s) licensed to practice in Ontario and shall be responsible for the preparation of drawings, specifications, reports and to act on behalf of the Developer in all technical aspects of the Development.

“Planner” shall mean the County and/or the Township Planner or their designate.

“Contractor” shall mean the firm of Contractors, the company of individuals acting as the Contractor and having entered into a contract with the Developer to construct the Development.

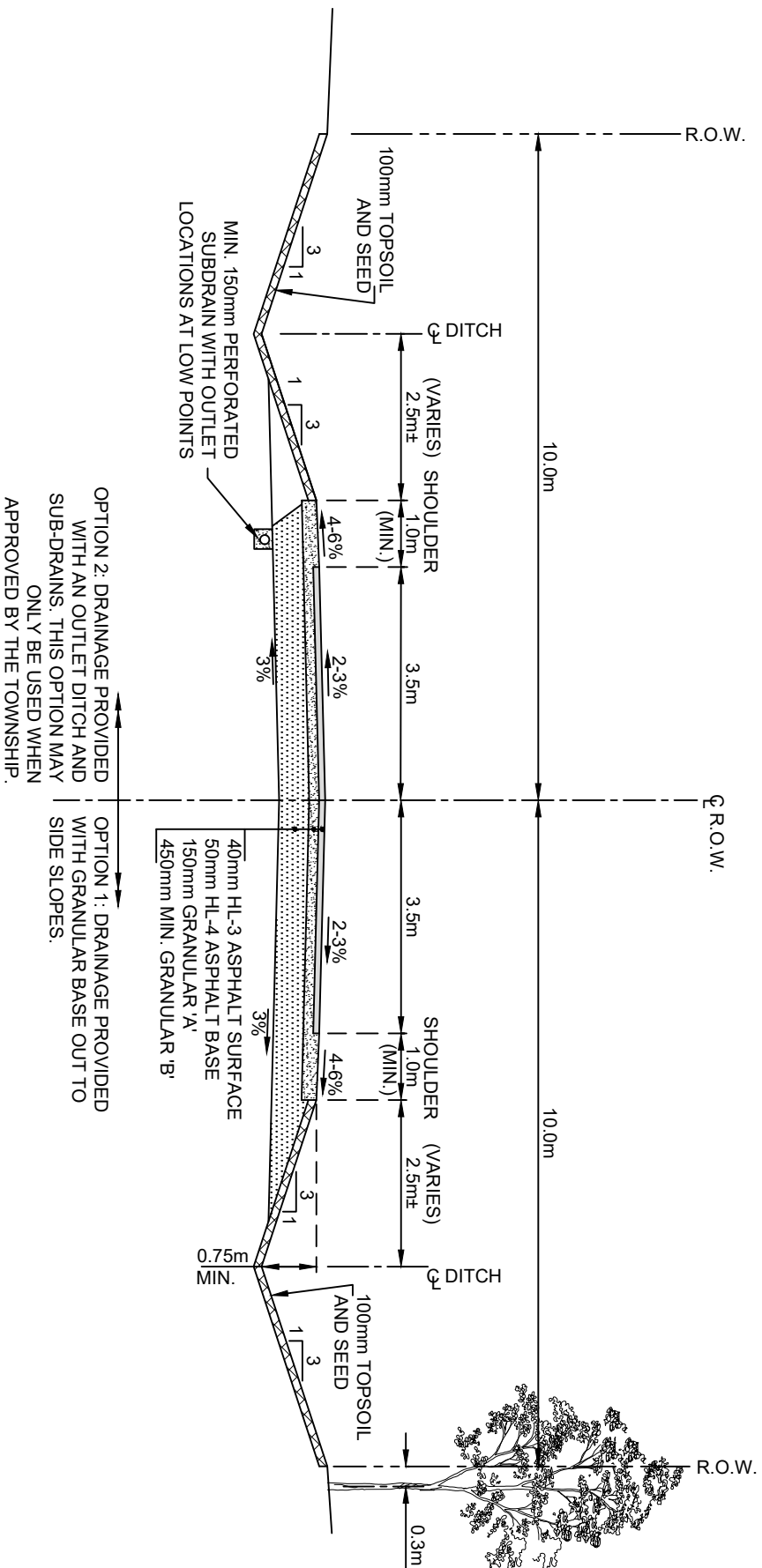
“Municipal Engineer” shall mean the municipal Public Works Manager and/or the engineer or engineering firm appointed as Municipal Engineer by the Township.

APPENDIX “A”

TYPICAL URBAN CROSS SECTION


APPENDIX “B”

RURAL ROAD CROSS SECTION



NOTES:

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG FULL WIDTH OF ROAD BETWEEN TOPS OF DITCH BACKSLOPES AND BOULEVARD TO BE FULLY SEEDED AS SPECIFIED.
2. ROAD CONSTRUCTION TO BE CONFIRMED BY GEOTECHNICAL DESIGN.
3. THIS CROSS-SECTION TO BE USED AS A TYPICAL STANDARD FOR UP TO 80 km/hr VELOCITY ROADS.
4. WHERE PRACTICAL SIDE AND BACK SLOPES FOR DITCHES AND SWALES ARE TO BE 3:1 MAXIMUM SIDE SLOPES OF 2:1 UNLESS OTHERWISE APPROVED.
5. THIS SECTION IS INTENDED FOR USE THROUGHOUT THE RURAL AREAS.

No.	DATE	REVISION	TOWNSHIP OF HOWICK TYPICAL ROAD CROSS-SECTION RURAL ROAD	
1	NOV 19/24	FIRST SUBMISSION		
				
			SCALE 1:100 HORZ (8.5 X 11)	
			DRAWING No. 4	

APPENDIX “C”

STORMWATER MANAGEMENT STANDARD FOR SITE PLANS OR SMALL DEVELOPMENTS

SECTION A – STORM DRAINAGE AND STORMWATER MANAGEMENT

1.0 DRAINAGE POLICIES

1.1 Application

These drainage policies will apply to all development or redevelopment requiring site plans or other planning approvals. Where the local Conservation Authority determines the development is in their regulated area or they have an interest in the development, their standard and policies shall apply.

1.2 Drainage Objectives

The Township of Howick has set the following objectives for the management of storm drainage within its boundaries:

- Reduce to acceptable levels, the potential risk of health hazards, loss of life and property damage from flooding.
- Reduce to acceptable levels, the incidence of inconvenience caused by surface ponding and flooding.
- Ensure that any development or redevelopment minimizes the impact of change to the groundwater regime; increased pollution; increased erosion or increased sediment transport, especially during construction; and impact to surrounding lands and areas of existing development.
- Maintain, where applicable, any natural stream channel geometry insofar as it is feasible while achieving the above objectives.

2.0 ATTAINMENT OF DRAINAGE OBJECTIVES

2.1 Major and Minor Systems

In general, the Township of Howick supports the concept of drainage having two separate and distinct components – the minor drainage system and the major drainage system. The minor system comprises swales, street gutters, ditches, catch basins and storm sewers. The major system comprises the natural streams and valleys and man-made channels, roads, or other overland conveyance systems.

2.2 Run-off Quality Control

The Municipality requires developers, contractors and builders to plan and execute their operations so as to minimize sediment and debris pickup and transport to water bodies. The degree of control and methods used must meet the regulations and standard of the MECP, MNRF, MTO, and local conservation authorities. The Municipality will

expect all erosion control works to be properly maintained throughout the duration of the project.

2.3 Master Drainage Plans

The Municipality requires a Master Drainage Plan for all proposed urban developments. The primary purpose of the Master Drainage Plan is to define the effects of urban development and to determine the solution that is compatible with the objectives for the watershed.

2.4 Conservation Authority Criteria

In the design of new drainage systems within areas regulated by the local Conservation Authority, the Developer's Engineer will be required to follow the most recent edition of the Authority's Stormwater Management Policies and Technical Standard.

3.0 MAJOR SYSTEM

3.1 Hazard Lands and Floodlines

The Township of Howick requires that Hazard Lands be clearly defined on all watersheds and that no development other than necessary access or services be located herein. The Municipality also requires that the floodplains that would result from the 1:100 and Regional storms be defined for predevelopment and post development conditions. Consultation with the local Conservation Authority will be necessary when dealing with Hazard Lands.

3.2 Detention Ponds

Detention Ponds shall be design so as to minimize any adverse effects to the environment as well as ensuring the safety of local residents. Unless noted otherwise, detention ponds are to be designed in accordance with the Ministry of the Environment, Conservation and Parks Stormwater Management Planning and Design Manual (March 2003), or the latest edition.

4.0 MINOR SYSTEM

4.1 Watershed Area

The watershed area shall be determined from the contour plans and shall include all areas that naturally drain into the system. Fringe areas not accommodated in adjacent drainage systems, and any areas which may become tributary by reason of regrading.

4.2 Storm Drainage Plans

External Areas

A plan shall be prepared to a scale dependent on the size of the watershed area, to show the nature of the drainage of the lands surrounding the development site. The area to be developed and all existing contours used to justify the design shall be clearly shown. This plan shall be prepared and submitted to the Municipality's Engineer at the functional report stage.

Internal Drainage Plan

All internal drainage plans shall be prepared and shall include all streets, blocks, lots and easements. The proposed storm sewer system shall be shown on this plan with all maintenance holes and the area contributing to each structure shall be clearly outlined on the plan. The area in hectares and the run-off coefficient shall be shown within the contributing area.

In determining the contributing area to each storm sewer structure, the proposed lot grading must be considered to maintain consistency in the design.

The length, size, and grade of each section of the minor system shall also be shown on the storm drainage plan. Arrows should depict the overland flow route and the extent of flooding from the major storm.

Rain water leaders shall not be connected directly to the storm sewer system. Leaders on all single family and semi-detached residential units shall be constructed in a manner so as to not interfere with adjacent properties. Sump pump discharge should discharge to the side yard swale.

5.0 HYDRAULIC DESIGN

5.1 Design Levels

The system of street gutters, catch basins, storm sewers or open ditches, where permitted, shall be designed for the 1:5 year storm. Culverts or sewers crossing major County roads or Provincial highways shall be designed and approved in accordance with the requirements of the County of Huron Highways Department or the Ministry of Transportation, respectively.

5.2 Rational Method

In general, the Rational Method shall be used for the sizing of the minor sewer system at the final design stage. Calculations based on a hydrologic simulation model are required for systems serving large areas or involving treatment and/or storage systems.

5.3 Stormwater Management Report

Hydrologic studies should describe the model parameters and criteria for their selection as well as input and output data. The Consulting Engineer has the responsibility for the computations, and the Municipality's Engineer shall check the main assumptions and the input data. All information required for this verification shall be submitted with the hydrologic computations. Copies of the report, where required, shall be provided to the local Conservation Authority and the MECP for approval purposes.

Each report shall include a section outlining the following:

- Run-off Quantity Control
 - Address the impact of the minor and major storm as required in these standard for both predevelopment and post development regimes.
- Run-off Quality Control
 - Address best management practices proposed to achieve desired treatment.
 - Refer to MECP Stormwater Management Planning and Design manual and Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains.
- Erosion and Sediment Control Plan
 - Provide comments and detail on a Site Plan or a separate plan as part of the submission.
- Major System/Overland Flow Routes
 - Provide extent of flood for the Major Storm or Site Plan
 - Show major storm route
 - Comment on a right to access of major storm routes based on land ownership on adjacent lands
- Maintenance Considerations
 - Address ownership and obligation for maintenance
 - A maintenance manual outlining maintenance tasks and frequency of maintenance activities shall be provided as part of the Stormwater Management Report process.
- Facility Access
 - Access to all areas of any proposed facility needs to be detailed and commented on in the report.

6.0 STORM SEWER DESIGN

The requirements for storm sewer design shall be in accordance with the latest edition of the Ministry of the Environment, Conservation and Parks Design Standard, as summarized below.

6.1 Rainfall Intensity Data

Rainfall intensity data to be used in storm sewer design shall be the most current data provided by Environment Canada for the Goderich area.

6.2 Design Storm Events

a) Rational Method

Stormwater run-off rates to be computed using the Goderich area I.D.F. curve information.

b) Hydrologic Simulation Models

Stormwater run-off rates to be computed using the Chicago distribution for the 6 hour storm unless otherwise required by external review agencies (Conservation Authority or MTO, etc.)

c) Hydrologic Simulation Models

Stormwater run-off rates to be computed using the Chicago distribution for the 6 hour storm unless otherwise required by external review agencies (Conservation Authority or MTO, etc.)

6.3 Run-off or Imperviousness Coefficients

Run-off coefficients to be used in storm sewer design with the Rational Method shall be based upon soil types, slope, and initial moisture conditions within the following ranges:

Asphalt, concrete, roof areas	0.90–1.00
Grassed areas, parkland, agricultural	0.15 -0.35
Brick Road	0.70 -0.85
Sandy Soil	0.05 - 0.25
Playgrounds	0.20 – 0.35
Gravel	0.60 – 0.70
Forest and dense wooded areas	0.10 – 0.25
Permeable pavements	0.15 – 0.25
Commercial	0.75 – 0.85
Industrial	0.65 – 0.75
Residential:	
– Single Family	0.40 – 0.45
– Semi-detached	0.45 – 0.60
– Row housing, Town housing	0.50 – 0.70
– Apartments	0.60 – 0.75
– Institutional	0.40 – 0.75

A ten minute entry time at the head of the system must be utilized unless large external drainage areas exist. (In this case, separate time of concentration calculations should be provided).

6.4 Pipe Capacities

Manning's Formula shall be used in determining the capacity of all storm sewers. The capacity of the sewer shall be determined on the basis of the pipe flowing full.

The value of the roughness coefficient 'n' used in the Manning's Formula shall be as follows:

- a) Concrete/Plastic pipe all sizes 0.013
- b) Corrugated Steel (culverts only) 0.024 (plain pipe)
0.020 (paved invert)

6.5 Flow Velocities

Minimum ☐ 0.80 m/s

Maximum ☐ 6.00 m/s

6.6 Minimum Sizes

Minimum pipe size for storm sewers and catch basin leads shall be 300 mm with a minimum of 1% slope.

6.7 Minimum Grades

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

Sewer Size (mm)	Minimum Slope in Metres Per 100 Metres
300 - 375	0.40
450 - 525	0.30
600 - 900	0.20
> 975	T.B.D.

6.8 Minimum Cover

The minimum cover to the top outside pipe barrel of a shallow storm sewer system shall in no case be less than 1.3 metres from the centerline of the roadway.

6.9 Location

Any storm sewers within road allowances shall be located as shown on the standard Township of Howick road cross section drawings (Appendix 'A').

6.10 Limits

All sewers shall be terminated at the development limits when external drainage areas are considered in the design. Suitable provision shall be provided to allow for the future extension of the sewer (i.e., maintenance hole knock-outs, sewer stubs, etc.).

6.11 Sewer Alignment

All storm sewers shall be laid in a straight line between maintenance holes.

6.12 Pipe Crossings

A minimum clearance of 0.20 metres shall be provided between the outside of all pipe barrels at all points of crossing. In the event of watermain crossing, Ministry of the Environment, Conservation and Parks separation distances shall apply.

In cases where the storm sewer crosses a recent utility trench at an elevation higher than the elevation of the utility, a support system shall be designed to prevent settlements of the storm sewer, or alternatively the utility trench is to be excavated and backfilled with compacted crushed stone or concrete to adequately support the storm sewer. When the storm sewer passes under an existing utility, adequate support shall construction to prevent damage to that utility. In either case, the support system shall meet the minimum requirements provided by the utility company.

6.13 Changes in Pipe Size

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

6.14 Sewer Pipe Materials

- a) Concrete Sewer Pipe (Rigid)
 - 150 mm to 375 mm Class 3
 - 375 mm or greater as specified in the tender form
- b) Polyvinyl Chloride (PVC) Pipe (Flexible)
 - Class SDR35 or Class V (320 kPa)
 - Annular ribbed profile for ribbed pipe
- c) Polyethylene Sewer Pipe (Flexible) – CSA certified Sewer Class to B 182.6
 - 150 mm to 600 mm
 - Smooth inner wall, annular corrugated profile (320 kPa), 15 PSI bell and spigot joints shall have elastomeric gaskets (CSA certified to B 182.6)

The Municipality shall be consulted for the material of any storm sewer > 900 mm or deeper than 5 metres

6.15 Pipe Bedding

The class of pipe and the type of bedding shall be selected to suit loading and proposed construction conditions. Details and types of bedding are illustrated in OPS Drawing 802.03.

6.16 Backfill for Sewers

Backfill for sewers shall be in accordance with OPSD 803.04.

7.0 MAINTENANCE HOLES

7.1 Location

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

7.2 Maximum Spacing of Maintenance Holes

Maintenance hole spacing shall be as per MECP Design Guidelines as follows:

Sewer Diameter (mm)	Maximum Spacing (m)
300 to 975	110
1050 to 1350	130
1500 to 1650	160
1800 and above	305

7.3 Maintenance Hole Types

Maintenance holes may be constructed of precast or poured concrete. The standard maintenance hole details as shown on the OPS Drawings shall be used for maintenance holes. In cases where the standard drawings are not applicable, the maintenance holes shall be individually designed and detailed.

Precast maintenance holes shall conform to ASTM specifications C-478 M latest revision.

A reference shall be made on all profile drawings to the type and size of all storm maintenance holes.

7.4 Maintenance Hole Design

- a) Safety gratings shall be provided in all maintenance holes when the depth of the structure exceeds 5.0 m.

- b) When the difference in elevation between the obvert of the inlet and outlet pipes exceeds 0.9 m, a drop structure shall be placed on the inlet pipe.
- c) All storm sewer maintenance holes shall be benched in accordance with the OPS Drawings.

7.5 Grades for Maintenance Hole Frames and Covers

All maintenance holes located within the traveled portion of a roadway shall have the rim elevation set flush to the base course of asphalt. Prior to the placement of the surface course asphalt the maintenance hole frame shall be adjusted to the finished grade of asphalt. Steel adjusting rings will not be permitted. The concreting and setting of the frame and cover shall be in accordance with the details on the OPS Drawings. A maximum of 300 mm of modular rings shall be permitted on maintenance hole in new subdivisions.

7.6 Head Losses Through Maintenance Holes

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

The minimum drops across maintenance holes shall be as follows:

Change of Direction	Minimum Drop (mm)
1 to 45 degrees	30 mm
46 to 90 degrees	60 mm

8.0 CATCH BASINS

8.1 Location and Spacing

Catch basins shall be generally located upstream of sidewalk crossings at intersections.

Catch basins spacing will vary with street width, grade and cross fall, the location shall be provided on both sides of the street at all low areas with the maximum spacing as noted:

Road Gradient (%)	Maximum Spacing (m)
0 to 3	110
3.1 to 4.5	90
Over 4.5	75

Double catch basins shall normally be required when the catch basin intercepts flow from more than one direction. Single catch basins may be used in the case where the total length of drainage to the catch basin is subject to the analysis of the major – minor system.

Rear lot catch basins and connections shall be located as outlined in the lot grading criteria and in all cases shall discharge/connect to a structure.

8.2 Catch Basin Types

Catch basins must be of the precast type with full depth sumps, as shown on the OPS Drawing 705.010.

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

8.3 Catch Basin Connections

Type	Minimum Size of Connection	Minimum Grade of Connection
Single and Double Catch Basins	300 mm	1.0%
Rear Lot Catch Basin	250 mm	1.0%

8.4 Catch Basins Frame and Covers

The frame and cover for catch basins shall be as detailed in the OPS Drawing 400.110.

9.0 INLETS, OUTFALLS AND SPECIAL STRUCTURES

9.1 Inlets

Inlet structures must be fully designed and detailed on the Engineering Drawings. Gabions, rip rap or concrete shall be provided at all inlets to protect against erosion and to channelize flow to the inlet structure.

9.2 Outlets

The OPSD 804.030 standard headwall shall be used for all storm sewers up to 900 mm in diameter. For sewers over 900 mm in diameter, the OPSD 804.040 headwall shall be used. All headwalls shall be equipped with a grating over the outlet as per OPSD 804.050.

Suitable erosion protection, which may include gabions, rip rap, concrete or other erosion protection shall be provided to the satisfaction

of the regulatory agencies at all outlets to prevent erosion of the watercourse and the area adjacent to the headwall.

9.3 Open Channels

The proposed criteria for an open channel shall be submitted to the Municipal Engineer for their approval. The Consulting Engineer shall be responsible for obtaining the approval from the MNRF, MECP, and the local Conservation Authority, if the open channel concept is favourably considered.

The Conservation Authority shall be consulted during initial project planning in regard to any potential watercourse alterations associated with the development proposal.

Watercourse alterations are subject to permitting requirements under the Authority's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 147/06). Planned watercourse alterations may, in addition, be subject to other Agency requirements (DFO, MNRF, Navigable Waters (Transport Canada), Drainage Act, etc.).

10.0 MAINTENANCE MANUAL

Prior to completion of the works a maintenance manual shall be provided. This manual shall address the obligations for maintenance, outline the appropriate tasks, and shall provide the frequency of maintenance measures required.

SECTION B – LOT GRADING AND DRAINAGE PLAN

1.0 GENERAL

The lot grading of all lots and blocks in new subdivisions must be carefully monitored by the Consulting Engineer in order to provide sites that are suitable for the erection of buildings and to provide satisfactory drainage from all lands within the development.

2.0 LOT GRADING PLANS

All Lot Grading Plans for new development in the Township of Howick shall be prepared in accordance with the criteria contained in this section and shall contain the following information and detail:

- Scale 1:500 (unless otherwise approved).
- All existing and proposed lot numbers and blocks.
- All proposed rear lot catch basins, leads, top elevations and inverts.
- Location of service connections.
- Existing contours at maximum 0.5 m intervals.
- Existing and proposed elevations at lot corners.
- Specified house grades.
- Proposed road grades, length and elevations on all streets.
- Proposed elevations along the boundary of all blocks abutting single family and semi- detached lots in the subdivision.
- Direction of the surface run-off by means of arrows.
- All proposed easements required for registration.

3.0 LOT GRADING DESIGN

- Generally, the front yards of all lots shall be graded to drain towards the street.
- All boulevards are to be graded with a constant slope from the curb to the street limit. (Minimum slope to be 2.0 percent and the maximum slope to be 8.0 percent).
- All rear yard drainage is to be directed away from the houses in defined swales which outlet at the curb or a catch basin.
- All lot surfaces shall be constructed to a minimum grade of 2.0 percent and a maximum grade of 12.0 percent.

- The maximum slope on all embankments and terraces shall be 3:1 (4:1 preferred).
- The maximum flow allowable to any side yard swale shall be that from two lots plus that from two adjacent lots.
- The maximum number of rear lots contributing to a rear yard swale shall be that of four rear yards.
- The maximum length of a rear yard swale between outlets shall be 90 metres. Where rear yard swales provide drainage for more than one lot, the swale must be located within a 4.0 metre drainage easement over the total length. Rear yard swales shall have a minimum slope of 1.5 percent.
- Swales providing internal drainage from each lot shall have a minimum slope of 2.0 percent.
- Minimum depth of any swale to be 150 mm.
- Maximum depth of rear yard swales to be 500 mm.
- Maximum depth of side yard swales to be 300 mm.
- Maximum side slopes on any swale to be 3:1.
- All drainage swales shall be located on the common lot line between adjacent lots.
- Rear yard catch basins and outlet pipes are to be located entirely on the same lot and shall be located 1.0 metres from the lot line.
- The minimum driveway grade shall be 1.0 percent and the maximum grade permissible shall be 8.0 percent.

4.0 INDIVIDUAL LOT GRADING PLAN

Prior to application for a building permit, individual lot grading plans for each lot shall be prepared and shall be submitted to the Municipality's Building Department for approval. These lot grading plans shall include the following:

- Lot description including Registered Plan Number.
- Dimensioned property limits and house location.
- House type; normal, side split, back split, etc.
- Finished floor elevation.
- Finished garage floor elevation.
- Finished and original grades over septic tile beds.
- Finished basement floor elevation.
- Top of foundation wall elevations (all locations).
- Existing and proposed lot elevations.

- Existing trees to be maintained.
- Driveway location, width and proposed grades.
- All sidewalk locations, width and proposed grades.
- Arrows indicating the direction of all surface drainage and swales.
- Location and elevation of swales.
- Location of decks, porches and patios.
- Location of terraces and retaining walls.
- Location and type of any private sewage disposal systems, reserve areas and private wells.
- Location of engineered fill (where required).
- Lot grading certificate by Developer's Engineer in accordance with the subdivision agreement requirements.
- In the case where the lot falls within the Conservation Authority's regulatory limit, the Conservation Authority shall be consulted regarding any additional information provided on the plan.

4.1 Certification

Prior to the release of any lot from the subdivision agreement, the Developer's Engineer shall provide certification to the Township of Howick that the grading and drainage of the lot is in accordance with the approved lot grading and drainage plans.