SITE PLAN DEVELOPMENT TECHNICAL SERVICING GUIDE

TOWNSHIP OF ASHFIELD-COLBORNE-WAWANOSH

NORTH HURON

Howick TOWNSHIP

Municipality of Bluewater

Central Huron

HURON EAST

HURON COUNTY

MUNICIPALITY OF SOUTH HURON

Prepared by:

BMROSS engineering better communities

THE MUNICIPALITIES AND TOWNSHIPS OF HURON COUNTY

SITE PLAN DEVELOPMENT TECHNICAL SERVICING GUIDE

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Contents

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Feedback is important to will be collected on ongoing basis as input to future revisions of this document. Please forward comments and feedback to publicworks@huroncounty.ca

Acronyms

ABCA	Ausable Bayfield Conservation Authority
AODA	Accessibility for Ontarians with Disabilities Act
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CA	Conservation Authority
CBMH	Catch Basin Maintenance Hole
CSA	Canadian Standards Association
CSP	Corrugated Steel Pipe
DFO	Department of Fisheries and Oceans
ETV	Environmental Technology Verification
GB	Governing Body
HDPE	High Density Polyethylene
HCPD	Huron County Planning & Development Department
LID	Low Impact Development
MECP	Ministry of Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
MVCA	Maitland Valley Conservation Authority
MTD	Manufactured Treatment Devices
MTO	Ministry of Transportation
O&M	Operations and Maintenance Manual
OLS	Ontario Land Surveyor
OPSD	Ontario Provincial Standard Drawings
OPSS	Ontario Provincial Standards Specifications

PDC	Private Drain Connections
PDF	Portable Document Format
SPA	Site Plan Agreement
SWM	Stormwater Management
SVCA	Saugeen Valley Conservation Authority
TSSA	Technical Standards and Safety Authority
UTRCA	Upper Thames River Conservation Authority

Definitions and Glossary

Approval Authorities – a local, municipal, County or Provincial agency mandated to provide an approval or permit prior to development or alteration of a site. Examples of approval authorities include municipalities, Conservation Authorities, Ministry of Transportation, local Heritage Committees.

Brown Field Site – a site where past industrial or commercial activities may have left contamination.

Cross Boundary Agreement – an agreement between neighbouring municipalities to allow provision of services (often water or wastewater) from one municipality within an area of another, i.e. across a municipal boundary.

Governing Body – the applicable authority for decisions or specific design or construction specifications related to technical servicing components. The Governing Body may be a local, County or Provincial authority. For instance, the Governing Body related to County Road is the County of Huron, whereas local roads are governed by the municipality.

Green Field Site – a previously undeveloped site.

Review Team – is the group responsible for the review of site plans. It typically includes municipal staff, the municipal engineer and municipal planner. It may also include staff from other approval agencies.

Securities – a deposit held by the municipality to ensure work is completed as specified in the site plan.

Sensitive Land Use – land uses that may be adversely affected by an adjacent development.

Site Plan – a set of drawings that specify the site and building design elements and technical servicing components for a proposed development.

Site Plan Agreement – an agreement between the municipality and the developer that establishes the obligations of the owner to construct and maintain the site according the approved site plan. Site Plan Agreements are registered on the title of the property.

Site Plan Application – an application form that must be completed as part of a site plan application package.

Site Plan Control By-law – a municipal by-law that designates where and what types of development are subject to site plan approval prior to construction.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to serve as a guide and reference to the technical components of site plan development and review in Huron County. It has been developed with a focus on site plans, however, much of the technical information in this guide may be pertinent or is common to other development processes, including Plans of Subdivision, Plans of Condominium and other Development Agreements.

It is intended that this technical guide will provide developers, County and municipal staff an explanation of procedures, expectations, timelines and requirements for site plans and their review. Beyond detailing the general technical components and requirements for site plans, this Guide will outline the roles and responsibilities of involved parties and linkages with related development processes (e.g., planning processes).

Site plan control by-laws are utilized by municipalities throughout Huron County (see Figure 1.1) to require review and approval of plans for certain types of development prior to issuing a building permit. The site plan control by-law for each municipality specifies the types of development and areas where approval of a site plan is required. Often, approval under a site plan control by-law is required for medium and high density residential, commercial, institutional and industrial developments, redevelopments and expansions. **Site Plans are submitted to the local municipality for approval.**

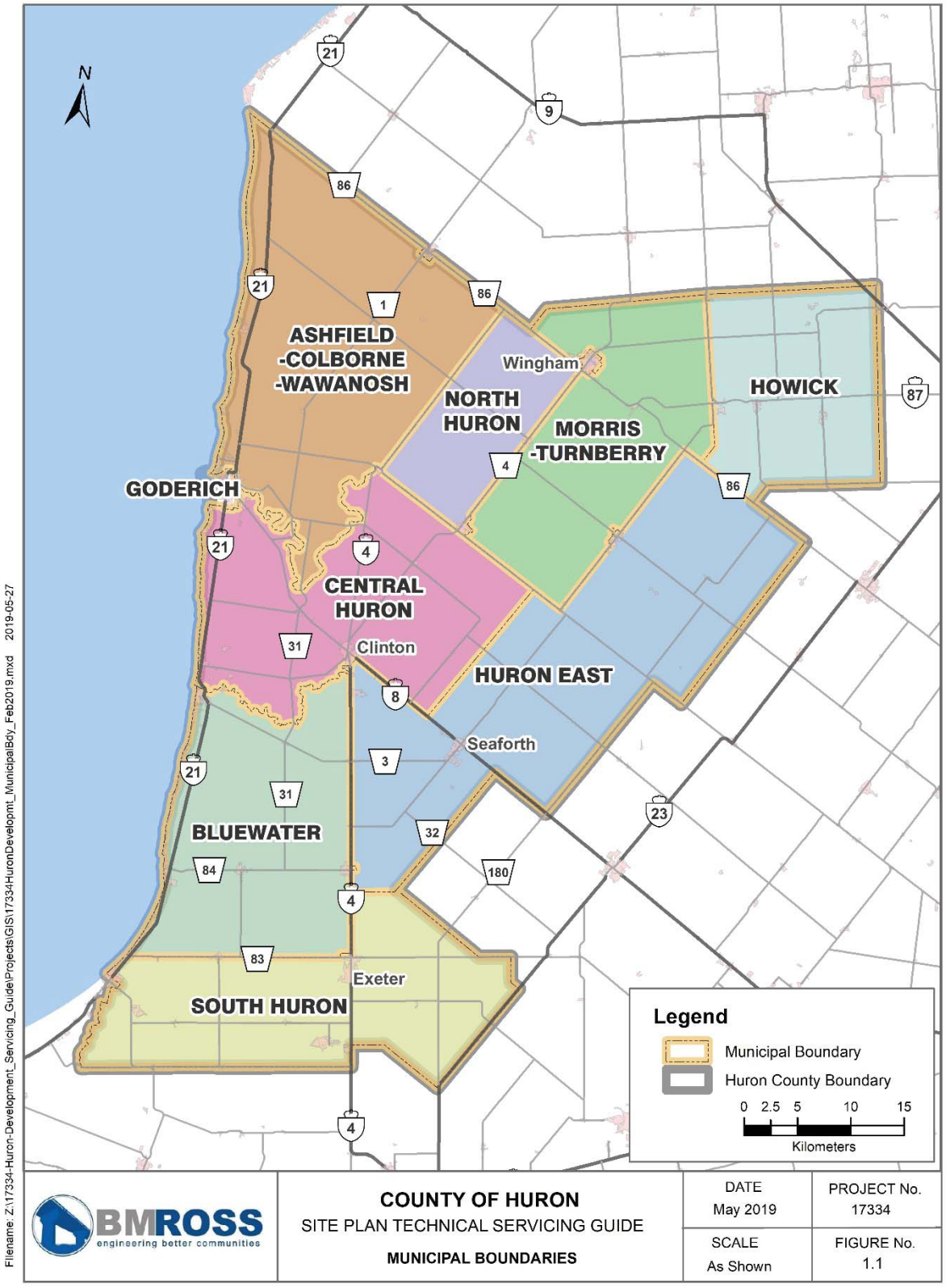
To obtain a site plan approval, the developer must submit a ‘site plan’ for review. The site plan may be a single drawing or set of drawings that show elements including, but not limited to: buildings, servicing, parking, landscaping, fencing, drainage and lighting in relation to the property and adjacent land uses. Prior to submission of the site plan for approval to municipal Council, a review team assesses the drawings to ensure they comply with municipal development and servicing standards, regulations and policies, such as those set out in Official Plans and Zoning By-laws. The review team also ensures that impacts to adjacent properties and land uses are minimized. Often the review team consists of municipal staff, the municipal engineer, County staff, and local review agencies (such as the Conservation Authority).

Feedback on the site plan is provided to the developer, and once the site plan meets the necessary requirements as identified by the review team, it may be submitted for approval by municipal Council. There may be some conditions of the site plan that need to be met prior to approval. Once the site plan is approved, the developer enters into a site plan agreement with the Municipality, which stipulates the conditions for development. The site plan agreement is registered on the title of the land to be developed to ensure that the development proceeds as documented in the site plan.

1.2 Disclaimer

This Guide is an attempt to capture common circumstances and general technical requirements for site plan development and review. It should be recognized that site plans will vary significantly in their complexity. Site-specific requirements also add variability to the process. Given the foregoing, there may be site-specific or development-specific circumstances that are not documented in this Guide. This Guide is not intended to capture the specifics of every

Figure 1.1: County of Huron and Lower Tier Municipalities



potential type of development across Huron County, but rather to provide guidance on the general site plan process, studies that may be required, and technical specifications for development. The Guide has been developed in an effort to provide as much information on the site plan process as possible to potential developers and municipal staff.

Municipalities within Huron County may also have established their own site plan process, engineering and servicing guidelines or requirements, and this document is not intended to supersede local, technical guidelines. **Where a municipality has established a specific site plan process or guidelines, developers will be expected to follow the municipal approach.**

It is expected that future updates to this Guide will incorporate additional information as gaps are identified.

1.3 Responsibilities

The site plan process generally involves the developer, the municipal review team, and various approval authorities. Each of these parties have responsibilities throughout the review and approval process. The responsibilities for the participants are summarized below and further explained for each step of the site plan process in the following sections of this Guide. Developers are typically responsible for:

Developer responsibilities include:

- ☐ Reviewing potential property use restrictions or requirements relating to Source Water Protection;
- ☐ Obtaining property and conceptualizing a plan for development;
- ☐ Hiring the required professionals to assist in producing a site plan. At a minimum, a professional architect, engineer, land surveyor or qualified designer is required to prepare the site plan drawings. Other professionals may be required for components of the site plan (e.g., landscape design, stormwater management, traffic impacts);
- ☐ Initial contact with the Municipality to start the site plan review process;
- ☐ Initial contact with the planner at the Municipality to identify the necessary planning processes (i.e., Official Plan or Zoning By-law amendments), if required;
- ☐ Submitting preliminary site plan drawings and technical studies (if required) to the review team;
- ☐ Reviewing need for other studies (e.g. archaeology, environmental impact study);
- ☐ Attending a pre-consultation meeting, and if necessary, additional meetings with the review team;
- ☐ Responding to and incorporating feedback from the review team into a revised site plan;
- ☐ Preparing revised site plans for submission to the review team to address deficiencies;
- ☐ Complete and submit a Site Plan Application form;
- ☐ Paying the Site Plan Application fee and any fees associated with review of the site plan;
- ☐ Applying and paying permit fees for agency approvals, if required;
- ☐ Submitting final site plan drawings;
- ☐ Reviewing and signing the Site Plan Agreement;
- ☐ Submitting securities;
- ☐ Meeting the conditions of the Site Plan Agreement; and
- ☐ Paying costs associated with extending of services to the property (if necessary).

The review team is typically responsible for:

- ☐ Review of preliminary site plans and providing feedback to the developer;
- ☐ Identification of required studies and/or approvals that may be required;
- ☐ Reviewing site plans and related studies to ensure they comply with municipal and development standards, by-laws, regulations and policies;
- ☐ Meeting with developers and their professional service providers; and
- ☐ Notifying developer of any additional permits or reviews required (e.g., Ministry of Transportation, Conservation Authority).

A number of additional approvals at may also be required as part of the site plan process. Municipal councils are responsible for approving site plans and site plan agreements, however approvals or permits from other agencies may be required prior to signing the Site Plan Agreement.

Approval agencies (County, local and provincial agencies) responsibilities include:

- ☐ Providing feedback on site plans and technical studies (if required); and
- ☐ Review and issue permits, agreements or approvals related to development, provided applicable conditions are met.

The responsibilities of the Municipality include:

- ☐ Administrating the Site Plan Control By-law;
- ☐ Designating who is responsible for coordinating site plans (Site Plan Coordinator, CAO, County Planner);
- ☐ Coordinating the pre-consultation meeting and review team;
- ☐ Review of the site plan and comments from the review team;
- ☐ Providing costs associated with review to the developer;
- ☐ Review Site Plan Application and accept fee;
- ☐ Prepare draft Site Plan Agreement;
- ☐ Providing amount ($) required for securities;
- ☐ Setting any required conditions, based on input from other agencies;
- ☐ Coordinate revisions to Agreement;
- ☐ Coordinate submission of Site Plan Agreement to Council;
- ☐ Approval or Denial of site plan;
- ☐ Registration of Site Plan Agreement on title;
- ☐ Inspection and enforcement of the conditions of the Site Plan Agreement; and
- ☐ Release of securities.

1.4 Explanatory Notes

For the purposes of this Guide, the numbering system utilized for the following sections corresponds with the steps outlined in the Site Plan Process flowchart (see Section 2). For the steps shown in the flowchart, the combination of letter and number correspond with sections of

the Guide. For example, the box numbered C.1 in the flowchart corresponds with the section C.1 of this Guide titled ‘Site Plan Approval Process’.

The steps of the site plan process flowchart, and subsequent sections of this Guide, are divided into three categories:

- A – Design concept to initial discussions;
- B – Studies and technical requirements; and
- C – Submission and the approval process.

Detailed information regarding technical studies, specifications and approval agencies can be found in sections 3, 4 and 5.

1.5 Site Plan Control By-Laws

Site Plan Control by-laws are enacted and enforced by municipalities. Municipalities across Huron County have their own specific site plan control by-law. A site plan control by-law establishes what types of development are required to obtain site plan approval prior to construction. The by-law may also specify what types of development are exempt from site plan control.

A site plan control by-law outlines the requirements for a site plan application. In some municipalities, this may include a mandatory requirement for a pre-consultation meeting or a reference to a pre-consultation by-law. The pre-consultation typically outline expectations for developers, such as the preliminary information that will be required, what information is available to developers, and an explanation of the requirement for securities and review fees that are likely to be incurred for the proposed development.

2.0 THE SITE PLAN PROCESS

Completing a site plan is one step in the overall development process that must be completed before a building permit is issued. Depending on the site and type of development, there may also be agency approvals and/or planning processes that need to be completed before applying for a building permit (see Figure 2.1). This Guide focuses on the site plan process, which is shown in Figure 2.2.

Figure 2.1 Development Process

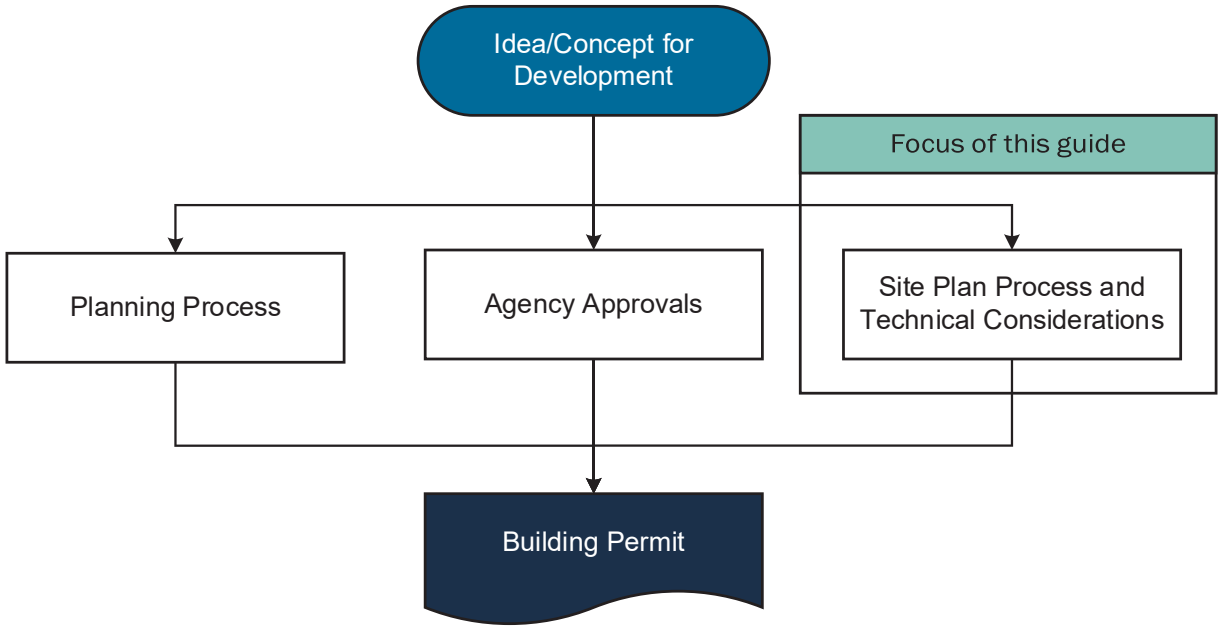
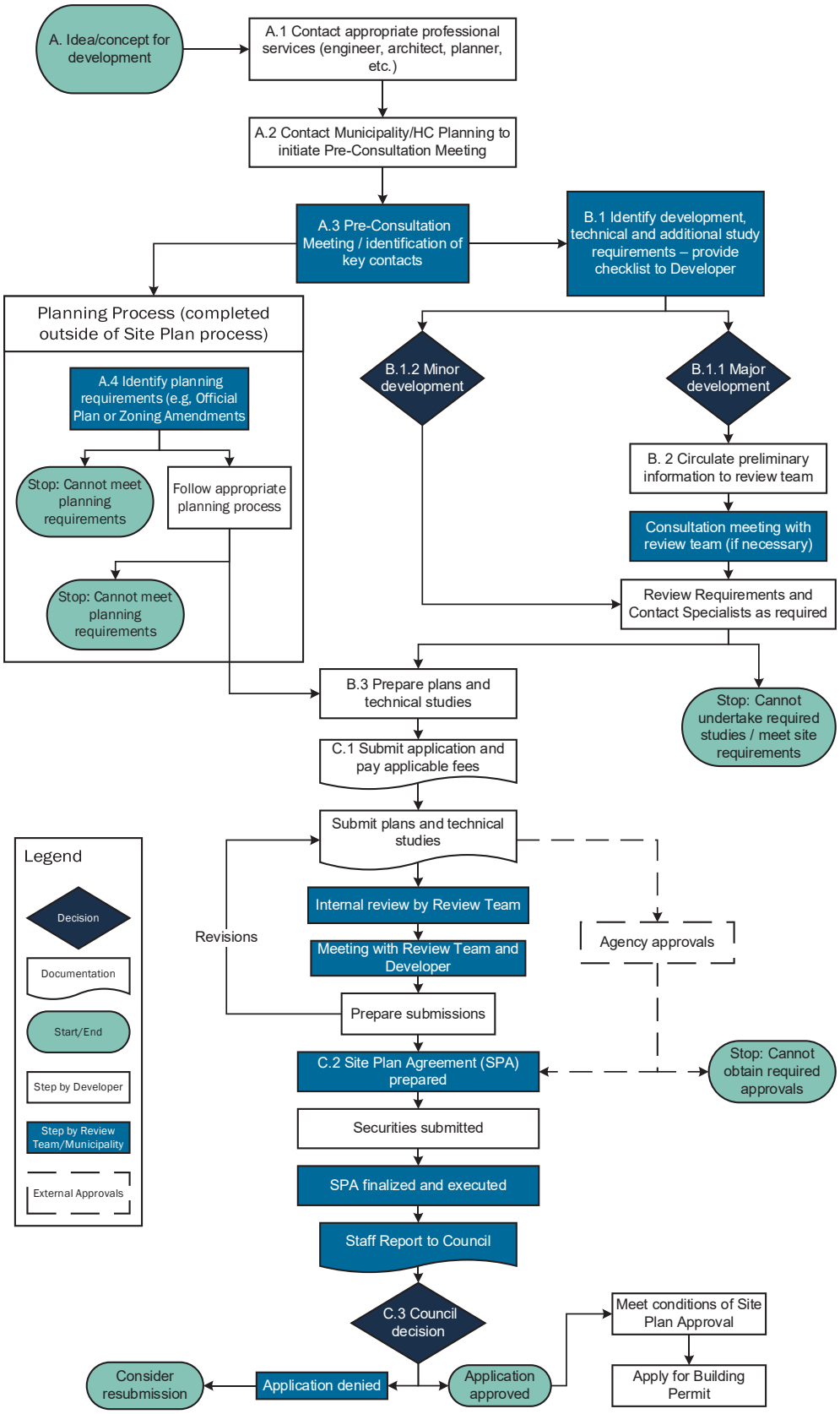


Figure 2.2 Site Plan Process



A. Development Concept to Initial Discussions

A.1. Development Concept

The first step in the site plan process is a concept for development - an idea for a new development, redevelopment or expansion of an existing site. At this stage, the developer should refine their idea and consider aspects of development including: property limitations such as size, required setbacks or restrictions relating to Source Water Protection policies; Zoning and Official Plan policies; and whether site plan approval will be required. The site plan control by-law of the municipality where the development is proposed will outline the types of development that require site plan review and approval. It should be noted that each municipality in Huron County has its own site plan control by-law and that types of development and redevelopment that require site plan approval may vary throughout the County.

The developer should also start considering what their development will require in terms of services, including sanitary sewage, water, stormwater, utilities including hydro, access and parking. For redevelopments, developers should identify existing services and if they will be sufficient for their needs.

Developer checklist:

- ☐ Review zoning and Official Plan designations and policies;
- ☐ Review Source Water Protection policies and mapping;
- ☐ Review the municipal site plan control by-law to determine if a site plan application is required for the type of proposed development;
- ☐ Review the municipality's development and servicing guidelines (if available);
- ☐ Confirm property limits and the extent of existing services (e.g., sewage, water, hydro, utilities);
- ☐ Consider what technical studies may be required (see Section 3) and costs;
- ☐ Consider what other studies (e.g. archaeology) may be required and costs;
- ☐ Retain professionals to complete technical and other studies that may be required;
- ☐ Meet with professional engineer/architect/surveyor to discuss the preparation of a preliminary site plan for the proposed development concept; and
- ☐ Initiate discussion with local utility providers (telecommunications, hydro, gas, etc.,).

A.2. Pre-Consultation

Pre-consultation meetings between the developer and at a minimum, the Municipal Planning Coordinator/Planer, are highly recommended. Having a pre-consultation with the municipality and municipal review team is helpful in avoiding delays and unforeseen costs later in the site plan review process. Some Municipalities may have mandatory pre-consultation requirements through their Site Plan Control By-law or Pre-consultation By-law.

It is up to the developer to contact the Municipal Planning Coordinator/Municipal Planner to request a pre-consultation meeting to review the proposed development concept. For this meeting, it is important that the developer provides a description of the development concept, as

well as a preliminary drawing or plan that illustrates the location and property limits of the chosen site. If possible, the drawing should show:

- ☐ Size, age and location of sanitary sewage connection or septic system;
- ☐ Size and location of municipal water line or private well;
- ☐ Location and size of hydro service, gas service, telecommunications;
- ☐ Legal survey of the property, if available;
- ☐ Topographic information for the site, if available;
- ☐ Location of drainage details for the property, including catch basins, ditches, drainage tiles, etc.;
- ☐ Size and dimensions of the proposed development;

Depending on the information available and type of development proposal, the Municipal Planning Coordinator/Planner may invite members of the review team (e.g. other municipal staff, the municipal engineer) to the pre-consultation meeting.

It is recommended that the developer retain professionals (planner, engineer/architect/surveyor) early in the process to help research and prepare the available and relevant information for the pre-consultation meeting. Retained professionals should be included in the pre-consultation meeting.

A pre-consultation agreement or form may be required from the municipality with an associated fee to initiate the process. This requirement would be identified in advance of the meeting by the Municipality. At the pre-consultation meeting, it is recommended that municipal staff review the site plan requirements. Developers should be made aware of the requirement for securities as well as the costs for review of the site plan. Staff should inform the developer of how and when review fees are collected.

Following the pre-consultation meeting, the Municipal Planning Coordinator/Planner will prepare and circulate minutes of the meeting.

Developer checklist:

- ☐ Contact the Municipality to request a pre-consultation meeting;
- ☐ Provide information, preliminary information and materials to the Planning Coordinator/Planner (at minimum, 1 week ahead of the scheduled meeting date);
- ☐ Contact retained professionals and ask them to attend the meeting; and
- ☐ Fill out pre-consultation request form and pay associated fees – if applicable.

The responsibilities of the Municipal Planning Coordinator/Planner

- ☐ Respond to pre-consultation request;
- ☐ Arrange date and location of pre-consultation meeting;
- ☐ Circulate materials received from developer to review team;
- ☐ Collect contact information for the developer and retained professionals;
- ☐ Contact review team members and advise of meeting and if their attendance is required;
- ☐ Review the site plan process, expectations and fees (including securities and review fees) with developers.
- ☐ Collect pre-consultation request form and fees (if applicable); and
- ☐ Take meeting notes and circulate to parties in attendance.

A.3. Associated Processes

Once a pre-consultation meeting is arranged and the project review team has been advised, there may be associated processes that will be triggered by the project that can be pursued in advance or in tandem with the site plan process. These associated processes include the following:

- ☐ Planning Act approvals (e.g. Official Plan and Zoning By-law amendments);
- ☐ Regulatory approvals (e.g. permit from local Conservation Authority); and
- ☐ Other municipal requirements (e.g. Heritage Committee approval, First Nation and Métis community consultations).

It is recommended that the developer contact the County of Huron Planning & Development Department (HCPD) to confirm whether the proposed development will require Official Plan and/or Zoning By-law amendments. HCPD staff will advise if any required amendments should be obtained in advance of the site plan process or in tandem. It should be noted that Official Plan and/or Zoning By-law amendments may take considerable time and are required to be completed prior to site plan approvals. HCPD staff will also review timelines and requirements for public meetings and Council meetings. The amendment process for Official Plans and Zoning By-laws, requires circulation to the local municipality, commenting agencies, and adjacent property owners. Following a public meeting, the County staff will provide a report to the municipal and County councils for review and a decision.

Regulatory approvals that may be required to facilitate the development will also be discussed at the pre-consultation meeting. If Conservation Authority (CA) approval is required, CA staff may be in attendance at the meeting and will advise of requirements associated with approval.

There may be other municipal requirements, such as approval from the local Heritage Committee, that can be reviewed in conjunction with the site plan process. There may also be requirements associated with the property that are not directly related to the site plan process, such as outstanding fees, charges, orders against the property, etc.

It is the developer's responsibility to provide the Municipality with copies of approval documents from other approval agencies.

Developer responsibility:

- ☐ To provide copies of approvals and/or permits from other approval agencies obtained during the site plan process to the Municipality.

A.4. Review Team

The Review Team will be comprised of various municipal representatives depending on the scope and scale of the project, potentially including staff from public works, planning, economic development and administration departments. If the project is located adjacent to or will impact a nearby County Road or County property, County Public Works staff will be included in the review team. The municipal planner, planning coordinator and engineer will also be included in the review of developments. If the property is located within an area regulated by a Conservation Authority (CA), their staff will be circulated and asked to review.

At the pre-consultation meeting the developer will be advised of who the primary contact for the review team will be and the preferred method of communication. The review team will identify a lead for the project and advise the applicant at the meeting. All communications for the project will be directed to the lead, who will be responsible for contacting other review team members for input, as required.

B. Studies and Technical Requirements for the Site Plan

B.1. Identifying Technical and Additional Study Requirements

There are a number of studies and technical information that are typically required to accompany a site plan application. The requirement for technical investigations and other studies may be dependent on:

- What type of development is proposed (e.g., residential, commercial, traffic generating, etc.) and the size;
- Site characteristics; and
- Adjacent land uses or features (e.g., a County or Provincially-owned road, a wetland, a sensitive use, etc.).

Depending on the level of detail provided by the applicant at the pre-consultation meeting, many of these requirements will be outlined by the review team at that meeting. Providing as much information about the proposed development and property as possible initially, will assist the review team in identifying additional study requirements early in the process. In some cases, additional studies may be identified later, once the full scope of the proposal is understood. Occasionally a study or technical criteria is not identified until the results of other investigations are completed.

A checklist will be provided at the pre-consultation meeting indicating which studies or additional information will be required to facilitate review of the proposed development. Be advised that additional studies and requirements may still be identified later in the process once all of the information is compiled and evaluated. A sample checklist of potential technical and additional studies and their triggers is provided in Section 3 of this document.

It is required that any additional studies identified by the study team, technical or otherwise, will be completed by the appropriate experts or licensed professionals at the expense of the developer. For example, a licensed engineer is required to complete a traffic impact assessment study.

The majority of technical and other studies will be reviewed by the review team; however, there may be some studies that require review from approval agencies (e.g., the local Conservation Authority, Ministry of Transportation, etc.). More information on approval agencies is provided in Section 5. Developers should be aware that the process of reviewing technical studies takes time and if a number of technical studies are required, the development proposal will take more time to review. If approvals are required from approval agencies (such as the MTO, MECP), delays in obtaining approvals may delay approval of the site plan or authorization to proceed to construction. It should be noted that approvals make take considerable time and, on a case-by-cases, conditional approvals may be provided to proceed to construction with commitments to make necessary changes to comply with approval certificates along with financial assurances in the form of securities.

B.1.1 Major Developments

Proposed developments are generally categorized as being minor or major. Typically, site plans for major developments will be more complex, requiring more review effort and potentially additional technical studies. The definition of major development may vary between

municipalities. A major development in one municipality may not be considered major in another, and vice versa.

The definition of major developments is not necessarily based on the size of the proposed building or property being reviewed. Generally, more complex proposals will be considered major developments. Some factors that may lead to a proposal being considered a major development include:

- ☐ Developments that will require cross-boundary agreements (e.g. for servicing);
- ☐ Development of a brown-field (previously developed) site;
- ☐ Site conditions (e.g. presence of natural features or hazards);
- ☐ Traffic-generating developments;
- ☐ Limited frontage or difficult access;
- ☐ Significant impervious areas or drainage issues;
- ☐ Significant servicing needs;
- ☐ Need for technical and additional studies and other approvals;
- ☐ Sensitive adjacent land uses or features; and
- ☐ Type of proposal;

Generally, site plans for major developments will require more effort on the part of both the developer and the review team.

The review team should discuss the following with the developer:

- ☐ If the development is major or minor;
- ☐ What additional studies may be required;
- ☐ Terms of references or scope of studies;
- ☐ Potential timelines and costs for review; and
- ☐ Other approvals that may be required.

The review team is responsible for determining if a proposal is a major development or minor development. It is important to determine if a proposal is major and to communicate with the developer as early in the process at possible. Identifying major developments should include discussions with the developer as listed below:

For major developments, developers should expect:

- ☐ Additional study requirements and the potential need to hire specialists and/or professionals;
- ☐ Detailed comments or questions from the review team;
- ☐ A potential need to obtain permits from approval agencies;
- ☐ Multiple revisions to the site plan may be required before being approved; and
- ☐ Additional time and costs associated with the review.

B.1.2 Minor Developments

Minor developments tend to be less complex, requiring less effort for review and generally fewer additional studies. Minor developments may include proposals:

- ☐ Where there are sufficient municipal services available or space for private services, where municipal services are not available;
- ☐ That will not generate high volumes of traffic;
- ☐ Do not require other approvals; and
- ☐ For minor expansions of existing, developed sites.

Similar to major developments, the review team will identify if the proposal is considered minor. Minor developments are expected to require less time for review.

B.2. Circulation of Information for Preliminary Review

For developments, the project lead will circulate review team members any preliminary information received from the developer following the pre-consultation meeting. The project lead for the review team should be established at the pre-consultation meeting. This preliminary information should include:

- ☐ Site Location;
- ☐ Type of proposed development;
- ☐ Developer contact information;
- ☐ Documentation regarding utility servicing, confirming access to utilities;
- ☐ Preliminary drawings (if available); and
- ☐ Copies of any studies (e.g. functional servicing report, stormwater management) completed.

At this stage, the review team may hold an internal meeting to discuss the proposal and potential needs in terms of technical requirements or additional studies. Following the meeting, the project lead will convey any additional requirements or questions from the review team to the developer.

The review team should:

- ☐ Review preliminary information;
- ☐ Meet, if necessary;
- ☐ Identify technical requirements or additional studies; and
- ☐ Provide project lead with technical or study requirements, comments or questions to convey to the developer.

B.3. Preparation of Plans and Technical Studies

Site Plan Drawings

Site plans must be prepared by a registered, professional architect, engineer, Ontario Land Surveyor or qualified designer. They must be dated (including revision dates), signed and bear a professional seal. The developer will be required to provide multiple paper and digital copies for the review team. Plans should be prepared in AutoCAD, and digital files should be

geographically referenced in a format suitable for insertion into a geographic information system (UTM NAD83 Zone 17). Digital copies must be provided as .pdf files. Paper copies should be printed at an appropriate size, so details are legible. Generally, this is 24 inches high by 36 inches wide (594 mm x 841 mm). Site plan drawings and technical studies should be submitted to the local municipality. The initial submission of drawings should also include a declaration from the developer's engineer stating they have been retained for the design. Additionally, it should be clearly stated who will be responsible to supervise the construction of the development in accordance with the terms of the site plan as well as provide as-built drawings at completion of the project. It is also the responsibility of the developer to fully explore the entire site for existing buried infrastructure, easements, etc.

Often a site plan consists of multiple drawings showing different components of the development. At a minimum, these drawings include:

- Site plan drawing (general layout with site data chart) – based off a legal survey;
- Servicing plan and profile; and
- Grading and drainage plan.

Other drawings that may also be required as part of the site plan, depending on the nature of the proposal and site:

- Landscape plan;
- Building elevations; and
- Lighting layout and distribution plan.

All site plan drawings submitted by developers are required to have:

- ☐ Address and name of development;
- ☐ Metric scale (not greater than 1:500) (may be larger for very large sites);
- ☐ North arrow;
- ☐ Appropriately scaled font size and line work;
- ☐ Topographic contours or spot elevations for adjacent properties;
- ☐ Name, address, telephone and email address of author;
- ☐ Geodetic benchmark;
- ☐ Property limits (including bearings and dimensions);
- ☐ Existing and proposed structures, driveways, storage and parking areas with dimensions;
- ☐ Roads (include names), lanes, easements, road widenings, reserves and right-of-ways;
- ☐ Author's professional stamp;
- ☐ A standard title block in the lower right corner, including information such as revision dates;
- ☐ Existing infrastructure and structures shown in greyscale as dotted or dashed lines; and
- ☐ Proposed servicing infrastructure (including septic systems) and buildings shown in a solid, darker colour (to stand out from existing).

General Layout Drawings submitted by developers are required to have:

- ☐ A table of site statistics showing compliance with zoning requirements (e.g. lot area, percent lot coverage – proposed and permitted, lot frontage, gross floor area permitted and proposed, paved area, landscape area proposed and permitted, and parking spaces proposed and required);
- ☐ All yard and setback requirements;
- ☐ Driveways, parking stalls (including barrier-free) and aisles, and dimensions;
- ☐ A key plan;
- ☐ Above ground utilities, existing and proposed (poles, meters, lighting, signs, transformers, utility pedestals, hydrants);
- ☐ Turning radii;
- ☐ Exterior surface treatments;
- ☐ Loading areas and dimensions;
- ☐ Garbage and recycling enclosures;
- ☐ Existing and proposed signage;
- ☐ Fire routes (where required);
- ☐ Building entrances;
- ☐ Finished floor elevation;
- ☐ Pedestrian paths on the site and any connections to off-site paths;
- ☐ Any active transportation features (e.g. bicycle racks, etc.);
- ☐ Snow storage areas;
- ☐ Any Source Water Protection areas (e.g. Highly Vulnerable Areas, Well Head Protection Area, etc.);
- ☐ Flood lines, as specified by the local Conservation Authority;
- ☐ Mail delivery or post box location;
- ☐ Location of rooftop equipment and screening features;
- ☐ Location, height and type of proposed fencing and retaining walls;
- ☐ Any outdoor storage areas; and
- ☐ Generator set location.

Servicing Plan Drawings submitted by developers are required to have:

- ☐ Geodetic and site benchmarks;
- ☐ All existing underground services (including utilities, septic systems) on streets and easements within the property limits and adjacent streets/easements;
- ☐ Topographic contours and spot elevations;
- ☐ Road allowances, lot and block frontages, easements and reserves;
- ☐ Curb, gutter and sidewalk, with dimensions;
- ☐ Road widths, cross-sections, ditches, ditch gradients, and curb gradients;
- ☐ For stormwater and sanitary sewers – location, size, connection details, direction of flow, and invert elevations
- ☐ For watermains – connections, hydrants, valves and diameters;
- ☐ Length, grade, pipe material and class, usage and bedding type for all pipes;
- ☐ Stormwater management devices;
- ☐ Catchbasins and manholes, including top and invert elevations;
- ☐ Ditches, swales and culvert details (including direction of flow);
- ☐ Existing and proposed fencing (height and type), hedges, trees
- ☐ Basement floor elevations;
- ☐ Existing and proposed elevations;
- ☐ Adjacent off-site servicing;
- ☐ Roof water leader discharge points; and
- ☐ Erosion and sediment controls.

Site Grading Plans submitted by developers are required to have:

- ☐ Geodetic and site benchmarks;
- ☐ 1:500 scale;
- ☐ Existing and proposed lot numbers and blocks;
- ☐ All proposed rear lot catch basins, leads, top elevations and inverts;
- ☐ Location of service connections;
- ☐ Pipe sizes, slope and directions of flow;
- ☐ Location of any easements for registration;
- ☐ Topographic contours (with a maximum of 0.5 m contours) and spot elevations;
- ☐ Centre line of road grades along streets adjacent to the property and existing grades;
- ☐ Legend for existing and proposed grades;
- ☐ Proposed and existing elevation and key locations around the site (e.g., lot corners) and buildings;
- ☐ Drainage arrows and percentage of cross fall to catchbasins;
- ☐ Building elevations (e.g. basement floor, finished first floor);
- ☐ Erosion and sediment controls;
- ☐ Sidewalks and walkways, including base and surface material;
- ☐ Manholes, catchbasins, hydrants and valves;
- ☐ Spot elevations for catchbasins, sub-drains, entrances.
- ☐ Retaining wall, including top and bottom elevations and engineering details; and
- ☐ Elevation of driveways, parking areas and other paved areas.

Building Elevation Drawings submitted by developers are required to have:

- ☐ Architectural elevations of each façade, with orientation labelled;
- ☐ Building materials and colours;
- ☐ Screening for mechanical units;
- ☐ Building dimensions;
- ☐ Facade signage;
- ☐ Location of windows, doors, loading docks; and
- ☐ Details for garbage enclosures.

Landscape Plans submitted by developers are required to have:

- ☐ Adjacent lands and roads marked with spot elevations;
- ☐ Walkways, parking areas, signage, street furniture, and above ground services;
- ☐ Natural features, specifically features/trees to be preserved or removed;
- ☐ Planting details for trees and shrubs; and
- ☐ Location of any landscape features (e.g. paths, fences, planters, retaining walls, etc.).

Any drawings submitted that do not meet the requirements or are missing information will require revision and resubmission. The project lead will inform the developer of any missing requirements or requests for further information from the review team.

Technical Studies

Any required technical or additional studies required as part of the site plan review should be completed by the appropriate professional or specialists. For example, a Traffic Impact Study should be completed by a professional engineer, specializing in traffic assessments. Developers should be aware that multiple copies of any technical or other studies will be required, including hard and digital copies. More specific requirements for specialized studies are outlined in Section 3.

For the purposes of this report, technical studies can include studies related to the site, such as archaeology, environmental impact studies, or cultural heritage studies. It is important that developers understand that these types of studies may also be required, depending on the site. These studies may be required prior to submission of the site plan application or as a condition within the site plan agreement. Some studies may require peer review at the request of the Governing Body (GB) at the cost to the developer.

C. Submitting and the Approval Process

C.1. Site Plan Applications and Fees

When the site plan drawings and required studies are ready for review, the developer can complete and submit a site plan application. Site plan application forms are typically available on municipal websites or from the municipal planner. The form must be completed and submitted with site plan drawings, required studies, and the review fee. Questions regarding the site plan application form and review fee should be directed towards the municipal Planning Coordinator or Planner. Required site plan application fees will be identified during the pre-consultation meeting and are detailed within the Municipality's/County's Fee Schedule.

Municipalities may utilize a graduated fee schedule based upon a percentage of the anticipated project construction costs or review requirements.

A Site Plan Submission must include:

- ☐ A completed and signed site plan application form (available from the municipality);
- ☐ The required number of site plan drawing sets (both in digital and hard copy);
- ☐ The required number of copies of any associated studies;
- ☐ Review fee; and
- ☐ Copies of approval documents from other approval agencies (e.g., Conservation Authorities, Ministry of Transportation, local Heritage Committee).

Once a site plan application is submitted and associated fees are paid by the developer, the Planning Coordinator or Planner, should review the application form to ensure it has been filled out correctly and completely. Drawings and studies should be circulated to the review team.

The responsibilities of the Municipal Planning Coordinator/Planner

- ☐ Collect site plan application fees;
- ☐ Review site plan application form to ensure it is complete; and
- ☐ Advise developer if application submission is complete.

The review team, upon receiving the complete site plan submission, will review the drawings and the studies. Information on the site plan drawing and associated studies/technical information is reviewed against accepted municipal or engineering standards to ensure that the proposed development is in conformity. In addition, to ensure compliance with established standards, the proposed development is evaluated to ensure that completion of the project will not result in negative impacts to adjacent properties or the community in general (drainage, noise, traffic, aesthetics, air quality, etc.). If required, the review team may meet as a group and/or with the developer. The review team may make recommendations for revisions regarding the proposal. It is the developer's responsibility to make any revisions and resubmit revised drawings.

C.1.1 Securities

Securities are a monetary deposit collected by the municipality, from the developer. A security is collected to ensure the developer complies with the site plan and associated conditions and to protect against developer abandonment. If a developer defaults, securities may be used to complete or remediate site work. The amount that is required in securities is dependent on the scope and scale of the proposed development and is determined by the municipality.

Generally, the preferred form of security is a letter of credit with automatic renewal, unless notified (typically 30 days notice of non-renewal is required). Individual municipalities may prefer or allow other forms of securities. Developers should confirm what the preferred form of security is as well as what the terms of the release of securities will be.

Securities may be released in stages, depending on the scope and scale of development. Typically securities are released when the municipality is satisfied the site work has been completed to an acceptable standard.

C.2. Site Plan Agreement

A site plan agreement is a legal document which outlines a series of conditions and requirements associated with the proposed development. The agreement must be registered on the title of the property where the development is located. A site plan agreement is required for all developments that complete the site plan approval process.

Following submission of the site plan and all associated studies and technical requirements, a draft Site Plan Agreement will be prepared by the Municipality and provided to the applicant for their review. Specific commitments, conditions and criteria associated with the development and its construction will be outlined in the agreement. The applicant may have the document reviewed by their own legal counsel before finalizing.

The review team will:

- ☐ Provide the Municipal Planning Coordinator/Planner with requirements, conditions or criteria associated with the proposed development for inclusion in the Site Plan Agreement;
- ☐ Provide input on required securities;

The responsibilities of the Municipal Planning Coordinator/Planner

- ☐ Compile input from the review team and draft the Site Plan Agreement;
- ☐ Advise developer of required securities and terms of release;
- ☐ Provide a copy of the Site Plan Agreement for the developer to review;
- ☐ Finalize Agreement following review by developer; and
- ☐ Collect securities.

The developer must:

- ☐ Review the Site Plan Agreement;
- ☐ Provide comments, if any, on the Agreement;
- ☐ Submit required securities;
- ☐ Sign the Site Plan Agreement;

C.3. Site Plan Approval Process

Following finalization of the Site Plan Agreement, Municipal staff will prepare a report to Council outlining the proposed development. The report will either recommend approving or denying the Site Plan Application. If the Site Plan Application and Agreement is approved by Council, the Agreement will be signed by the municipality and executed. The Site Plan Agreement will be registered on title of the property by municipal staff.

If the Agreement is denied, the developer may appeal the decision or consider further revisions or resubmission.

C.4. Site Plan Execution

Following approval of the Site Plan Agreement, the developer is responsible for carrying out the work as specified in the Site Plan and within any conditions of the Site Plan Agreement and required permits. When the work is completed to the satisfaction of the Municipality, the securities will be released.

C.5. Site Plan Revisions

Should revisions to the Site Plan be required, the developer is responsible for submitting a revised Site Plan for review to the municipality. The revisions are reviewed by the municipal review team and are either approved or denied.

3.0 TECHNICAL STUDIES AND REPORTS

The scope and scale of the proposed development will determine what technical studies or reports are required to assist the project review team with their review of the proposal. Technical studies are typically completed by professionals and will often have specific criteria or guidelines with which they must conform.

It is important to note that the requirement for studies is site and development specific. Minor developments or expansions of existing sites may not require detailed studies. The intent of the list below is to provide developers with an understanding of the types of studies that have been required in Huron County in the past. It should not be assumed that every development will require every type of study. Additionally, the costs presented are general estimates for major developments, costs may be less for minor developments.

The studies/reports that will be required will generally be identified at the pre-consultation meeting. However, the requirement for some studies may not be determined until later in the review process once the full scope of the development, and potential impacts associated with the proposal, are understood. The trigger for some studies will be identified by the project team based upon municipal/County standards or as a result of input from agencies. The following table lists technical studies and reports that **may** be required as part of the site plan process. It also lists potential triggers for each study. The following section provides additional information on each study, including general requirements. The reports are listed with the most common studies and reports that would be required for a development noted first.

Table 3.1: Technical Studies and Triggers

Study	Requirement or Potential Trigger(s)	Triggered by Planning or Technical Review
Stormwater Management Report	☐ Requirement for all development/ redevelopment except minor may not require a full stormwater management report	Technical
Sediment and Erosion Control Plan	☐ Requirement for all development/ redevelopment	Technical
Lot Grading and Drainage	☐ Requirement for all development/ redevelopment	Technical
Planning Rationale or Justification Report	☐ Where development or redevelopment requires Official Plan or Zoning By-law amendment	Planning
Servicing Brief or Functional Servicing Report	☐ Requirement for all development/redevelopment	Technical
Geotechnical Assessment or Slope Stability Study	☐ Development/redevelopment proposed near slopes or floodplains ☐ Property has high water table, unstable soils	Technical

Archaeological Assessment	☐ Development in areas of known or high archaeological potential (e.g. near water features, early settlement areas, cemeteries, other archaeological sites)	Planning
Traffic Impact Assessment or Traffic Impact Brief	☐ Development may impact traffic existing movements ☐ Development will generate significant traffic	Technical
Environmental Impact Study	☐ Proposed development located within or adjacent to a significant natural heritage feature (woodland, wetland, Area of Natural or Scientific Interest, Species at Risk habitat)	Planning
Environmental Site Assessment (may require Record of Site Condition)	☐ Redevelopment of a brownfield (previously developed) site.	Planning or Technical
Hydrology/Floodplain Analysis	☐ Development located within floodplain	Technical
Landscaping Plan/Design	☐ Required for all development/redevelopments	Technical
Tree Saving/Preservation Plan	☐ Site is forested or partly treed	Planning
Hydrogeological Study	☐ Development type may impact groundwater flows ☐ Development requires a well (case-by-case basis)	Technical
Cultural Heritage Evaluation or Heritage Impact Assessment	☐ If development will impact building or structure greater than 40 years old ☐ Redevelopment of heritage building ☐ Development within municipally designated Heritage Area	Planning
Noise Study	☐ Development may generate noise and impact sensitive adjacent uses (residences) ☐ Development may be impacted by adjacent noise-generating land uses	Planning or Technical
Lighting and Photometric Design Study	☐ Development may have lighting impacts on adjacent properties	Planning or Technical
Vibration Study	☐ If pile driving is required	Technical
Structural Engineering Report	☐ Redevelopment of an existing building for a new use or range of uses	Technical
Air Quality	☐ If development or construction may result in impacts to air quality (including dust)	Planning or Technical

3.1 Required Studies

Details of common technical studies that are required, or may be required, for site plan applications are described below. A brief summary of the purpose of each study and a typical range of potential professional fees is listed in Appendix A. In addition, **studies may need to be reviewed by a third-party consultant and the cost for the review will be paid by the developer.**

Stormwater Management Report (SWM Report)

A stormwater management report evaluates the drainage on the site and ensures that stormwater runoff is controlled. The report addresses stormwater quality and quantity for the site. Typically, post-development site drainage conditions must be designed to match pre-development site conditions. External drainage inputs must be included in the calculations and the report must show that drainage leaving the property is discharged at an adequate outlet. Guidelines for the completion of SWM Reports are often provided by the local Conservation Authority or the Municipality. A SWM Report is required for any new development. An engineering professional is required to complete a SWM Report.

Minor developments may not require a full SWM report, a letter or grading plan may be sufficient.

Sediment and Erosion Control Plan The sediment and erosion control plan is required for all new development and redevelopment applications and is prepared by an engineering firm in conjunction with the stormwater management and lot grading and drainage plans. The sediment and erosion control plan must coordinate with the grading and drainage plan and will show the location of measures designed to minimize sediment loss and erosion on the site during construction. Measures such as sediment fencing, rock check dams, rock rip rap, sediment basins, straw bale check dams, filter cloth, geotextile fabric, etc., are commonly used.

The drawings would show the location of various measures and details would be included on the drawings that would specify how they are to be installed and maintained during site construction activities. Sediment and erosion control details are often included in the stormwater management report and may be shown on the same drawing as the lot grading and drainage plan.

Lot Grading and Drainage Plan

To be completed in coordination with the stormwater management report, the lot grading and drainage plan. While the stormwater management plan provides a high-level review of drainage for the entire property and surrounding lands, the lot grading and drainage is a more detailed review of individual lot grading, road grades and drainage details. The plan would form one of a set of drawings submitted as part of the development application and would include both existing and proposed grades once the site is fully developed. The drawings would show proposed development lots and building envelopes and must show how drainage of the proposed buildings will be accommodated and the conveyance of drainage within and through the site. Detailed elevations are shown for road grades, entrances, laneways, around building envelopes, positive drainage on building lots, ditches and other conveyance systems.

Planning Rationale Report

A planning rationale report should be completed by a professional with land use planning experience. The report summarizes existing site land uses as well as land uses on adjacent properties in the vicinity of the proposed development. A review of the status of existing municipal and county planning documents (Zoning By-Law, Official Plan, Master Plans, Secondary Plans) for the site is included as well as an analysis of how the proposed development conforms to existing documents as well as Provincial Guidelines and other regional planning documents. Coordination with the County Planning & Development Department is encouraged when determining the scope of the Planning Rationale Report.

Servicing Brief/Functional Servicing Report

A servicing brief is required for most new developments and must be completed by an engineer registered with the Professional Engineers' Ontario. The study summarizes the status of existing municipal services (potable water, sanitary sewers and stormwater drainage) on and adjacent to the subject property and also summarizes how the proposed development will be serviced. Depending on the site, the report may include details related to:

- Roadway alignments, cross-sections and intersections;
- Roadway structures;
- Watercourse improvements and channelization;
- Railway crossings;
- Sanitary sewage infrastructure, including pumping stations;
- Water infrastructure, including pumping stations;
- Stormwater infrastructure;
- Lot grading; and
- Phasing – how it will occur, how infrastructure may be impacted and confirm that it will not limit future development areas.

The study will document the capacity of existing infrastructure and explain how servicing of the proposed development will impact existing municipal services. Generally, this will include calculations, details, costs to demonstrate the proposed development is compatible with existing infrastructure. These studies are reviewed by the Municipal Engineer and additional information or submissions may be required until acceptance by the Municipal Engineer and Municipality. Upon completion and acceptance by the Municipality, the Servicing Brief would be used in support of an Environmental Compliance Application (ECA) to the Ministry of Environmental Conservation and Parks (MECP) for the development.

Geotechnical Assessment

A geotechnical assessment is a technical study completed by a Geotechnical Engineer. The study assesses the subsurface conditions on the development site and provides recommendations, based on site conditions, for the construction of road bases, bedding for infrastructure, foundation construction, dewatering requirements, and any other site-specific issues identified during excavation of the site. A geotechnical assessment may also be required if a steep slope or ravine is located on a development site to assess setback requirements or slope stability, such as development adjacent to Lake Huron or adjacent to a river system.

Archaeological Assessment

An archaeological assessment must be completed by a Licensed Archaeologist and is required if the potential for archaeological resources being present is identified through completion of a screening process. The assessment involves the completion of various stages from 1-4 with an increasing level of review required for each subsequent stage as follows:

Stage 1 – Background study including historic information about the property

Stage 2 – Property assessment. Visual inspection of the property looking for the presence of historical artifacts. Test pits are often required to complete the assessment.

Stage 3 - Required if the results of the Stage 2 assessment identify material of cultural significance. Additional field work and investigations are conducted to verify the significance of the material that was identified.

Stage 4 - Mitigation of development impacts. Various options are explored to protect, conserve or avoid an identified archaeological site.

Traffic Impact Assessments

A traffic impact analysis is required to assess and evaluate the impacts of a proposed development on transportation networks in the vicinity of the project site. The analysis would typically include an assessment of current traffic conditions in the project area as well as anticipated traffic volumes following completion of the development, including a consideration of future growth in the study area. The need for a traffic study would typically be identified at the pre-consultation meeting, however if the full extent of the development is not yet known, the need may not be identified until later in the review process. Developments that are moderate in size may require a traffic impact analysis to review site access and impacts to adjacent properties. Large developments, or developments that will increase traffic in the local area, will require a comprehensive traffic study to review impacts.

The requirements and triggers for Traffic Impact Assessments for impacts to County Roads are set out in the Huron County Transportation Impact Assessment Guideline.

Environmental Impact Study (EIS)

An environmental impact assessment is triggered when a proposed development is located within or adjacent to a significant natural heritage feature such as a woodland, wetland, Area of Natural and Scientific Interest (ANSI), a Species at Risk (SAR) or their habitat. A study may be required if the development is located adjacent to one of these features and falls within the ‘Adjacent Lands’ definition in the Official Plan. The need for a study would typically be identified at the pre-consultation meeting based upon input from the Conservation Authority, County Biologist, or requirements in the Official Plan. The study scope would be determined once the development concept is finalized and proximity to the sensitive feature is known. Usually the Conservation Authority would approve a Terms of Reference for a proposed study before the study is completed. The EIS is completed by a biological consulting firm with experience completing EIS’s and will be reviewed by the County, upon completion, for thoroughness and accuracy before any recommendations contained within the report are accepted. Some components of the study are time sensitive, meaning that they can only be completed at certain

times of the calendar year. It is therefore important to identify the need for such a study early in the planning process so that the field work can be completed when required.

Hydrology/Floodplain Analysis

A hydrology or floodplain analysis is required if a proposed development is located adjacent to a watercourse or river system where seasonally high flooding events may inundate the property. The need for a study would be identified by the Conservation Authority once their input is sought. Conservation Authorities have development floodplain mapping for most urban areas, however rural areas may not have detailed mapping available. The scope of the assessment would be identified in consultation with the Conservation Authority and would show the portions of the development site that would be inundated with flood waters during a regulatory storm event and where the proposed development is located in proximity to these hazard areas. Safe ingress and egress from the site must also be demonstrated.

Environmental Site Assessment (ESA)

An environmental site assessment is required for brownfield sites (previously developed sites) where a new development or use is proposed. The study is completed by an engineering firm that specializes in environmental site assessments and examines the subsurface conditions on the site to determine if contamination related to previous land uses is present. The study involves an investigation of past site uses, interviews with previous land owners or tenants, and the collection of subsurface soils and groundwater which are sampled and compared relative to standard data bases for various elements. Depending on the results, site remediation may be required which could involve the excavation and removal of contaminated soils. Approval of the Site Plan may include a requirement or condition that a Record of Site Condition (RSC) is filed within the Ministry of Environment, Conservation and Parks.

Landscaping Plan/Design

A landscaping plan may be required for new developments as well as redevelopment applications. The base of the plan must conform to the proposed lot grading and drainage plan and is completed by a landscape designer or landscape architect. The landscaping plan shows the location of plant material to be installed in conjunction with the proposed development, such as boulevard trees, wind breaks, buffer strip plantings, plantings required in conjunction with stormwater management facilities (ponds, rain gardens, infiltration basins) and ornamental plantings adjacent to buildings. A drawing is prepared that shows the location of the plant material and is accompanied by information either on the drawing or in an attachment that details the size, species and number of plants required.

Tree Saving/Preservation Plan

A tree saving plan may be required if a proposed development site is forested or partly treed. A tree saving plan is completed by an arborist, a biologist or a landscape architect and includes specific mitigation measures aimed at minimizing impacts to existing tree cover on the property. Typically a plan is prepared that shows the location of all trees on the property and indicates which trees will be removed as part of the development and which trees will be preserved. Measures to safeguard impacts to the trees are also identified such as construction fencing to limit encroachment into forested areas, the tree drip line (edge of tree canopy), building envelopes and areas where construction can safely occur are also identified.

Hydrogeological Study

A hydrogeological study is required if the proposed use of the property has the potential to impact groundwater resources in the vicinity of the project site. This impact could be related to servicing requirements, drainage or development of the site.

The study involves an evaluation of subsurface soil and groundwater conditions for the subject property as well as adjacent lands potentially impacted by groundwater flows through the site. The study must be completed by a hydrogeologist and will include modelling of the site in its existing and developed state. Impacts to groundwater resources are documented as well as potential mitigation measures needed to mitigate any impacts.

Cultural Heritage Evaluation/Heritage Impact Assessment

The Ministry of Tourism Culture and Sport regulates impacts to buildings or structures that have cultural heritage value. If a proposed development will impact buildings or structures that are >40 years in age, a Cultural Heritage Evaluation may be needed to determine if the structures have heritage value. If it is determined to have cultural heritage value, a Heritage Impact Assessment (HIA) is required to determine appropriate mitigation to address the impacts. A heritage consultant must complete the evaluation.

Noise Study

A noise study may be triggered for two reasons; 1) a proposed development located adjacent to a more sensitive land use (e.g. existing residential) where the development will generate noise, and 2) a proposed development that is located in proximity to an existing land use that generates noise (e.g. proposed residential adjacent to a highway). The noise study is completed by professionals with experience completing noise assessments and includes an evaluation of existing background noise on the property from adjacent sources (industrial/commercial uses, highway noise, etc.) and provides recommendations to be incorporated into the proposed development to mitigate noise impacts. This may include soundproof barrier walls of varying heights, alignment of buildings, design details for windows, etc.

Lighting and Photometric Design Study

A lighting study is completed by an electrical engineer or designer and may be required for new residential subdivision applications, industrial or commercial developments. The study would examine background ambient lighting present at the site and provide recommendations for lighting associated with a proposed development to address concerns related to safety, security and municipal standards.

Vibration Study

If soils in the vicinity of the project site are unstable or pile driving is required to install deep foundations at the property, a vibration study may be required to monitor the impact of vibrations on adjacent properties. A study of this nature involves a pre-construction survey of adjacent buildings and structures to gather photos and other data which confirms the condition of the structures prior to the onset of construction. Monitors are then installed prior to construction to record vibration levels during construction activity that might generate movement (pile driving or

compaction of soil). A post construction survey is then conducted to record any changes or movement that occurred as a result of the work.

Air Quality Study

An air quality study is a technical study completed by a professional with experience completing this type of analysis. The study requirement would be triggered by a proposed land use or development with the potential to negatively impact air quality in the vicinity of the site as a result of site operations (physical operations or process discharges). The study must be completed in a manner that conforms to the Ministry of the Environment, Conservation and Park's Land Use Guideline D-6, which assesses the impacts of new developments on adjacent sensitive receptors (e. g. schools, residential areas, etc.). Potential air quality impacts could be health or nuisance related (dust/odour).

3.2 Review of Technical Studies

Upon completion and submission to the review team, technical studies are reviewed either internally by the review team members or externally by review agencies. In some cases, third-party review is required by a different firm that specializes in the particular type of study. Costs for any reviews will be the responsibility of developer

Studies being completed to address a specific concern expressed by a regulatory agency are generally reviewed by the agency that requested completion of the study. Below are a list of agencies and associated studies that may be requested as part of their review.

Table 3.2 : Agencies and Approval Authorities Responsible for Review of Technical Studies

Agencies/Approval Authorities	Type of Studies Reviewed
Conservation Authorities	• Hydrology/Floodplain Analysis • Environmental Impact Study (Third-party review may be required) • Geotechnical Assessment • Restricted Land Use Notices
Ministry of Natural Resources and Forestry (MNRF)	• Species at Risk Assessment • Fisheries Assessment • Environmental Impact Study
Ministry of Tourism, Culture and Sport (MTCS)	• Cultural Heritage Evaluation Report/HIA • Archaeology
Ministry of Transportation (MTO) (when adjacent to a provincial highway)	• Traffic Impact Assessment • Stormwater Management Study
Ministry of Environment, Conservation and Parks (MECP)	• Hydrogeological • Air Quality Study • Noise Study

Agencies/Approval Authorities	Type of Studies Reviewed
Municipal Engineer/Municipal Staff	• Stormwater Management Study • Sediment and Erosion Control Plan • Lot Grading and Drainage • Geotechnical Report • Servicing Brief • Lighting Study • Traffic Study • Air Quality
Planning & Development Department	• Planning Rationale Report
Health Unit	• Servicing Brief (if proposal involves on-site wastewater treatment, e.g. septic system) • Nitrate Study
County Public Works (when adjacent to County Road)	• Traffic Study • Servicing Brief • Stormwater Management Study
Railway (when adjacent to railway)	• General Layout

4.0 SITE PLAN TECHNICAL SPECIFICATIONS

4.1 General

The technical specifications have been prepared recognizing that there may be both internal and external works associated with a site plan. For works that are off-site and/or may ultimately be assumed by the GB a separate more detailed guideline is included in Section 5.0 and shall be referred to for the design of any works off-site and/or to be assumed or maintained by the GB.

4.1.1 Introduction

The design of all servicing infrastructure is to be based upon the specifications and guidelines in effect at the time of acceptance. All plans are to be accepted before they are to be used for the construction of services. Such acceptance shall in no way relieve the developer's consultant from providing an adequate and safe design.

This section of the Technical Servicing Guide references 'Governing Body' in relation to some specifications. The Governing Body (GB) may require certain specifications and can be a local, County or Provincial authority. For instance, the GB related to County Road is the County of Huron, whereas local roads are governed by the municipality.

4.1.2 Off-Site Infrastructure Construction

Any off-site infrastructure construction required in conjunction with a development will be done by a qualified Contractor. The GB may require proof of insurance and appropriate licensing. Alternatively, the work will be done by the GB at the expense of the developer. Whenever it is necessary to cut through an existing roadway, the Contractor will be responsible to obtain a permit from the GB where it is required by the GB. 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 GB's Public Works Department. In all cases, the fire, police departments, school bus companies and ambulance service must be notified by the developer or his Contractor.

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

The costs associated with off-site infrastructure design and construction will be paid by the developer.

4.1.3 Off-Site Infrastructure Inspection

The developer shall notify the GB 72 hours in advance of pending construction within a public road allowance. Work within a public road allowance may be subject to full-time construction review by the GB at their discretion. All inspection fees shall be borne by the developer. Following approval of off-site design and proposed Contractor, the developer shall notify the GB in advance of construction.

4.1.4 Site Plan Submission Drawings

As noted elsewhere the site plan submission may need to include the following plans:

- Legal
- Site plan – including existing conditions
- Site Servicing Plan

In general, each plan shall include the following pertinent information:

Legal Plan

- Plans in blackline only, including a calculation of its area, certified by an Ontario Land Surveyor;
- title, location of project, date, of the survey;
- north point and scale (graphic bar scale as well as written ratio scale); and
- bearings and distance of all property lines, and dimensions and location of all existing buildings and structures.

Site Plan

- dimensions and locations of all existing buildings or structures, fences, access driveways, fire hydrants and utility poles;
- existing site constraints, such as adjacent streets (showing curbs, gutters, ditches, etc.), sidewalks, rights of way and easements;
- the location, elevation, size and species of:
    - trees exceeding 100 mm (4 inches) diameter at breast height;
    - trees and shrubs exceeding 1.5 metres (5 feet) in height located:
        - on lands adjacent to the proposed development and within 3.0 metres (10 feet) of the common property line;
    - trees and shrubs on the boulevard of the public street along the streetline(s) of the proposed development
    - wetlands, ESA(s), woodlands and Areas of Natural and Scientific Interest
- existing location and/or distance of the nearest transit stop from the limits of the property;
- existing location and/or distance of the nearest transit stop from the limits of the property;
- existing uses on abutting properties;
- existing contours; existing servicing;
- existing easements or restrictive covenants;
- centre line and curb line of adjacent streets, sidewalks and existing street line; required dedication for street widening purposes and future road widening in accordance with adopted Council standards in the Official Plan and the Zoning By-law (all dimensions should be included on the drawing);
- if the site is adjacent to a river or large watercourse, the site plan drawing should show the location of the surface water at normal flows, the floodplain boundary, contours of the valley and the banks at not more than 1.5 m (5 feet) intervals and the dedication line;
- clear indication of subject property's boundary being the same as the legal plan (dimensions and area calculations);

- approximate location and height of buildings on adjacent sites;
- adjacent property owned or controlled by the applicant;
- locations, height and dimensions [distances between buildings and yard dimensions (front yard, side yard, rear yard)] of all buildings and other structures proposed on the site;
- a "site data" schedule;
- location and height of external lighting fixtures;
- garbage storage (type and location) and collection areas;
- loading and on site vehicular circulation areas, indicated widths and proposed direction of traffic flows as well as proposed ramps or access driveways;
- proposed parking areas or structures; number of spaces, dimensions of parking spaces, aisles and driveways, location of pedestrian and vehicular building entrances, and area to be devoted to each proposed use;
- proposed snow storage areas;
- landscaped areas;
- where there is a major change in existing topography, existing and proposed grades at key points, such as building corners, tops and bottoms of proposed slopes, walls, curbs and steps;
- location and height of free-standing signs;
- location of walkways and bicycle ways including surface treatment; and
- identification of transit routes abutting or adjacent to a proposed development site, and the location and/or distance from the limits of the site to the nearest transit stops.

Where Landscaping is required the following should be included incorporated:

- location by symbol of all existing trees (to be preserved) and proposed trees and shrubs (the symbol should reflect the branch spread or canopy of existing trees and shrubs, and the proposed trees and shrubs at maturity);
- a list of all species, including common name, botanical name, quantity, size and condition at planting;
- planting specifications including sodding;
- cross-section to show detailed tree and potted shrub planting methods;
- the landscape plan should include the professional endorsement (stamp) of a landscape architect or equivalent where warranted; and
- Trees and shrubs proposed for preservation and preservation measures can be incorporated on the Landscape Planting Plan.

Site Servicing Plan

Storm Drainage and Grading Plans

- catch basins - locations, proposed elevations for grates, and inverts;
- all manholes to show invert and finish grade elevations;
- drainage piping - location, size, grade (slope);
- private drain connections - existing and new, location, size and grade;
- drainage swales (landscaped areas) - elevations along swale, cross sections % grade (slope);

- overland flow - show flow arrows to permit ready identification of overland flow direction, show existing and proposed elevations along property lines, and key points on site and abutting properties;
- elevation information must extend onto abutting properties to provide context for the on-site grading;
- flows from adjacent properties - in the event that adjacent private properties drain onto the site being developed, the storm drainage system is to be designed to prevent storm water from backing up and creating a flooding or ponding condition on the adjacent property;
- stormwater management details are to be provided; and
- the site shall be designed to the standards and specifications summarized in Section 5.

Water System

- show size and location of watermain, valves, fire hydrants, siamese connections, chambers, water meter location(s), etc.;
- existing services and service box chambers;
- watermain and water service design to the site as per Section 5 and Ministry of the Environment requirements; and
- Ontario Building Code requirements should be referred to for internal service. Where details not specified in the Building Code, Section 5 shall be referred to.

Sanitary

- drainage piping - location, from building to private drain connections, size and grade;
- private drain connections - existing and new, location, size and grade;
- monitoring manholes (if required), to be located at the street line on private property;
- all manholes to show invert and finish grade elevations; and
- The design of “private” sewer and water are to conform to the requirements set out in the Ontario Building Code. In some cases, these systems may require a Certificate of Approval by the Ministry of Environment.

4.2 Entrances and Road Access

The following standards are provided for entrances associated with access to County Road infrastructure. Municipal entrances shall follow the guidelines provided by the Municipality. Entrances onto provincial roads must following the requirements of the MTO. Where no guidelines exist, the following standards shall apply.

4.2.1 External Road Widening

Where road widenings are required the plan shall show the land to be dedicated.

4.2.2 Control of Entrances

All entrances onto roads shall be under the control of the GB Public Works Department. New installations and modifications to existing entraces shall conform to this guidance document, current by-laws, and be completed according to standards. All costs shall be borne by the owners/developers. Shared entrances will only be allowed subject to review and require approval by the GB.

4.2.3 Permits

Entrance permits are required for the following:

- Construction of a new entrance;
- Changing the design of an existing entrance;
- Changing the location of an existing entrance;
- Changing the use of an existing entrance (i.e. the classification);
- Construction of a temporary entrance; and
- Paving of an existing entrance.

4.2.4 Classification of Entrances

Entrances may be classed into one of the following classes. The classification of an entrance cannot change, nor the entrance be used for any other purpose, without the entrance being reclassified by obtaining an entrance permit through the application process.

Table 4.1: Descriptions of Entrance Types

Entrance Classification	Description
Field Entrance	Provides access to agricultural fields.
Farm Entrance	Provides access to farm buildings and agricultural fields. Where a farm entrance also provides access to a farm residence it shall be classified as a residential entrance.
Residential Entrance	Provides access to residential facilities of four units or less.
Commercial/Industrial/Institutional Entrance	Provides access to a business where goods or services are manufactured, sold or distributed.
Temporary Entrance	Provides access to properties for a limited period of time, not to exceed one year, for the purpose of construction, repairs, or improvements on that property or to facilitate staged development. If an extension is required, the owner must apply for a new permit prior to the expiration of the existing one. A temporary permit shall specify: the expiry date, the extent and nature of the works to be done on the property, the owner's responsibility to clean up mud or debris from the road in a timely fashion.
Emergency Entrance	Provides access to subdivision developments for emergency vehicles only, in the event that the main entrance to the development is not passable. Adequate measures are to be incorporated to prevent use by residents or for delivery vehicles.
Public Entrance	Provides access onto a County road from a registered subdivision by means of a public street.
Private roads	Provide access to the following access to residential units of five or more units, into townhouse condominium developments, roads into public facilities such as landfill sites, parks, public institutions etc., private roads into resort areas providing access to a number of lots

4.2.5 General Policies

The following general policies shall apply to entrances, there are local variations that should be confirmed through communication with the GB:

Number of Entrances per Lot of Record

The number of entrances will be limited for a single property and may be based on original lot lines. Variations may be accepted subject to traffic impact assessment and review and approval from the GB. The following numbers of entrances per property are typically restricted to:

- Field Entrances: a minimum of one per farm with additional field entrances where natural obstructions within the field prevent reasonable access across the field;
- Farm: one per farm for farm buildings;
- Residential: one per property; and
- Commercial/Industrial/Institutional: typically, a maximum of two with a minimum spacing of 30 metres between entrances. Additional entrances may be approved under special circumstances.
- Mixed Use: entrances are reviewed and approved on a case by case basis.

Local by-laws will prevail with what is and is not permitted.

Location of Intersections

Where intersections occur, they should be located opposite each other to line up with an entrance on the other side of the road.

Truck Climbing Lanes, Deceleration Lanes and Acceleration Lanes

No access will be permitted on truck climbing, acceleration or deceleration lanes.

Guide Rails

Guide rails may require relocation of infrastructure or reconfiguration in the vicinity to accommodate an entrance, provided sight lines can be achieved.

Minimum Visibility Requirements

Sight distances are measured from a point 3 metres from the outer edge of the traffic lane at an eye level of 1.05 metres above the edge of the traffic lane to an object 0.60 metres in height above the roadway surface in the centre of all lanes affected by the entering vehicle. For example, on a two (2) lane road the distance is measured to the centre of the lanes in both directions. A sight distance verification report and plan prepared by an OLS or Engineer may be requested by the GB.

New entrances must meet the minimum sight distances and visibility triangle requirements provided in the Geometric Design Standards.

Minimum Visibility Requirements at Structures

The minimum sight distance requirements of entrances adjacent to bridges shall be applied.

Requirements for Spacing from Side Road Intersections

Entrances onto the sight line of the visibility triangle are not permitted. The minimum distances from the centreline of the intersecting road to the closest side of the proposed entrance will be provided by the County during the conceptual design stage.

4.2.6 Entrance Standards

Location of Entrances

The GB may restrict the placement and/or turning movements of an access to/from a road in the interest of public safety. New entrances must be located so that there are favorable vision, grade and alignment conditions for all traffic using the proposed entrance and the GB road and avoid constraints on changes to entrances of adjacent properties.

Typical minimum entrance distances from side property line to centreline of entrance. Local bylaws and zoning may vary:

- Private, Field and Residential Entrance – 10 metres;
- Farm Entrance – 15 metres; and
- Commercial, Industrial, Institutional Entrance – 20 metres.

Commercial/Industrial/Institutional Entrances and Public and Private Roads

Designs for commercial/industrial/institutional entrances and public and private roads must be submitted for approval as part of the entrance permit application procedure. The design shall be site specific, having regard for the number and type of vehicles expected to utilize the entrance. The entrance must be constructed and approved (including paving where required by this policy) before the establishment or the public or private road is open for business or use. The design shall provide for the entrance to be surfaced with asphalt or gravel to the property line. A Traffic Impact Study or Traffic Impact Brief are commonly required for entrances of this nature.

Entrance Grades

The finish grade of the entrance must drop away from the edge of the driving lane surface to the edge of the shoulder at the same rate as the shoulder. For a distance of 5.0 metres beyond the edge of the shoulder the slope shall not exceed 3%. Exceptions in urban areas are possible with detailed designs to address drainage.

For entrances on a steep slope or where earth cut or fill is required, Grading Plans showing existing and proposed features along with existing and proposed elevations will be required and to be submitted to the GB for approvals.

Field Entrances

Field entrances must be surfaced with at least 150 mm granular A. Where a culvert is required, its length shall be sufficient to provide a 3:1 slope up from the ditch invert to the edge of the entrance. A minimum cover on the culvert shall be 300 mm.

Farm and Residential Entrances

Farm and Residential entrances must be surfaced with at least 300 mm of Granular B and 150 mm Granular A and may have an asphalt surface. Where a culvert is required, its length shall

be sufficient to provide a 3:1 slope up from the ditch invert to the edge of the entrance. A minimum cover on the culvert shall be 300 mm.

Commercial and Institutional Entrances

Commercial and Institutional entrances shall be constructed to meet the requirements provided by the GB during the review stage and to the minimum presented in OPSD 350.010

Culvert

If a culvert is required, the culvert shall be a new High Density Polyethylene Pipe (HDPE). Used culvert pipe is not acceptable. All pipes to be C.S.A. approved and installed as per manufacturer's specifications.

Driveway entrance culverts shall have a minimum nominal diameter of 525 mm but larger diameter culverts may be required based on storm water management analysis.

Surface Water

Each entrance shall be designed, installed and maintained in a manner that will prevent surface water runoff from the entrance or from the adjoining property from being discharged onto the travelled portion of the road or the shoulder of the road. Water shall be directed into the roadside ditches or catchbasins where they exist or may be required to be installed or re-located from current position. Rip rap of entrance ditches may be necessary to prevent siltation of the roadside ditches.

Curb and Gutter

Where curb and gutter exists at the location of a proposed entrance, the applicant shall be required to construct a drop curb at the entrance location. The existing curb shall be cut or removed and replaced using materials and construction methods acceptable to the GB.

Temporary/Emergency Entrances

The design and construction details of temporary/emergency accesses must be submitted to and approved by the GB.

4.3 Parking Design

4.3.1 General

The requirements for parking are set out in municipal zoning by-laws. The zoning by-laws identify the specific requirements for number of spaces including barrier-free spaces, sizes, parking area locations, surface treatments, drainage, entrances, and exits. The guidelines included in this document are general and should be considered in conjunction with the requirements of the Zoning By-law.

Parking Lots

Parking lots should be located behind or beside buildings, away from the primary street frontages and street corners.

Limit the number of and width of curb cuts for street access into parking lots.

Circulation Routes

Vehicle circulation routes in parking areas should be predictable and well-defined. Routes should be distinct from exterior paths and loading areas. Routes should not include dead-end aisles.

Alignment

Position parking rows perpendicular to the main building entrance to assist in safe pedestrian movement.

Length of Parking Rows

Limit length of parking rows to maximum of 60 m. Longer rows should incorporate landscaped breaks.

Passenger Loading Areas

Passenger loading areas should be in close proximity to the main entrance to the building and along barrier-free exterior route of travel.

4.3.2 Curbing

Curbs should be used where required for grading, drainage and stormwater management and to define traffic islands, landscaped areas, entrances and exits. Curbs should be continuous poured concrete.

4.3.3 Accessibility

The international symbol of accessibility should be displayed on barrier-free parking stalls, loading zones, barrier-free ramps, and paths in accordance with AODA standards.

Barrier free parking spaces should be located in close proximity to principal building entrances.

Barrier-free drop off zones and parking spaces are to be flush with the adjacent sidewalk.

4.3.4 Paths, Walkways

Pedestrian paths of travel should be safe, direct, predictable and barrier-free. They should connect with the building entrances and exits, including emergency exits. Pedestrian routes should be designed to minimize pedestrian and vehicle crossing points, however, where pedestrian routes cross vehicle routes the crossing should be clearly marked with an unobstructed sight lines for both pedestrians and vehicles.

Walkways should incorporate surface treatments that are firm, stable, slip resistant, and capable of withstanding winter maintenance activities. They should incorporate changes in materials, textures, and/or colours to differentiate them from parking and vehicle circulation areas.

4.3.5 Landscaping

Parking areas should incorporate planted landscape areas. Landscaping can be used to screen parking areas, provide shade, wind breaks, define vehicle circulation routes and to provide visual relief from hard surfaces. Any landscaping plants used should be hardy, drought-resistant, salt-tolerant, and resistant to damage as a result of compacted soils.

Landscaped areas should be sufficiently sized to support the growth of trees and other vegetation. Interior landscaped areas should have a minimum area of 33 m^2, with a minimum dimension of 3 m in any direction. Plantings should include tree and understory planting, including shrubs, perennials, ornamental grasses and ground cover.

Landscaping should be used to divide large parking areas into smaller 100-125 space stall areas.

4.3.6 Snow Storage

Areas for snow storage must be identified on plans. Snow storage sites should be located away from public streets and pedestrian walkways. Snow storage should not impede pedestrian or vehicle sight lines.

4.3.7 Grading and Drainage

Parking areas and associated works are to be designed in accordance with the technical guidance information provided elsewhere in this document.

The property line (including the adjacent boulevards) abutting road allowances shall be graded so that they blend with the existing street grade.

4.3.8 Fire Department Access

Access routes for firefighting including the location, width, turning radius, vertical alignment and location of fire route signs shall be shown on the site plan. The access route shall be vetted through the GB and the local fire department. The minimum standards for fire routes shall be

- Width: 6.0 metres
- Overhead Clearance: 5.0 metres
- Minimum Centreline Turning Radius: 12.0 metres
- Maximum Gradient: 1 vertical in 12.5 horizontal over a minimum distance of 15 metres
- Maximum Dead end Distance without an Approved Turnaround Facility: 90 metres
- Design Loading: To support the expected loads of firefighting equipment

4.3.9 Facilities for Lighting

Objectives

To provide sufficient illumination of the site for: pedestrian security and safety; functional vehicular movement; enhancement of external building design and landscaped open space; reduce or eliminate the potential of any adverse effect of artificial light such as: glare, light trespass, light clutter, energy waste.

The type, location, height, intensity and direction of lighting shall ensure that glare or light is not cast onto adjacent residential properties or natural areas adversely affecting living environment, or onto adjacent public streets which would pose a vehicular safety hazard. Moreover, energy conservation measures must be considered to ensure that the site is not illuminated more than it need be. In some cases, the extent of lighting may be required to be reduced after normal business hours.

Where the GB feels there is a potential for concern, an illumination study may be required. In these cases a qualified engineer will prepare and provide a report demonstrating how the lighting is contained on the site and that the selection/style of light will not create glare and/or broadcast light onto adjacent properties or roadways, by the adjustment of refractors and/or the placement of shields.

4.4 Storm Drainage and Stormwater Management

These drainage policies will apply to all site plans requiring planning approvals. Stormwater quantity and quality must be satisfactorily addressed on all projects. The requirements of the GB, MECP and Conservation Authority will apply. Stormwater management should conform to any applicable sub-watershed study or master drainage plan. It is expected that technical design aspects for stormwater management will be detailed in a Stormwater Management Report.

In addition to the information provided herein, the latest versions of the following documents are to be used collectively to provide guidance and SWM criteria, necessary to implement a holistic treatment train approach to stormwater management in the area:

- Conservation Authority Stormwater Management Technical Guide; and
- MECP Stormwater Management Planning and Design Manual (2003).

4.4.1 Drainage Objectives

The GB will set the following objectives for the management of storm drainage within its boundaries:

- Reduce all post development flow rates to predevelopment or greenfield rates as may be required;
- Reduce to (individually) acceptable levels, the potential risk of loss of life, health hazards, 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; and
- Maintain, where applicable, any natural stream channel geometry insofar as it is feasible while achieving the above objectives.

4.4.2 Attainment of Drainage Objectives

Stormwater Management Report

A Stormwater Management Report setting out the existing and proposed drainage pattern shall be submitted to and approved by the GB, the Conservation Authority and the MECP and/or MTO (if required).

In general, the GB supports the concept of drainage having two separate and distinct components – the minor drainage system and the major drainage system. Both systems shall be considered in conjunction with the development of a stormwater management plan for the site.

The stormwater management requirements within the area shall be in-line with the following general requirements:

- Quality and quantity control – as dictated by the GB, local Conservation Authority and/or the MECP. Quantity control shall restrict post-development runoff flows to pre-development flows between the 1:2 and 1:100 year / Regional storm events. In some cases, the GB may require the post-development runoff flow rate to be controlled to the original predevelopment state (i.e., fully vegetated) regardless of the existing conditions.
- Downstream Conveyance capacity shall be reviewed prior to proceeding to detailed design work. Limitations will be discussed with the GB and the Conservation Authority. Generally, either capacity to an adequate outlet must be provided, or post development flows limited to the site's pro-rata share of available capacity, with available capacity being defined as the flow rate that does not cause flooding. Where informal / de-facto attenuation/storage is occurring on a site, pre-development runoff rate calculations, shall incorporate the de-facto attenuation/storage;
- The Stormwater Management design must account for the safe conveyance of the greater of the runoff rate generated during the 1:100 year storm or Regional event from the development area and external catchments draining through the property. In addition, the design must be completed to ensure that there are no negative impacts to owners of upstream or downstream lands occurring as a result of the Works, under ultimate as well as interim conditions.
- The design storm for the minor systems shall be the 1:5 year storm for local storm sewers and the 10 year storm for trunk facilities. The major system shall be designed to convey the greater of the 1:100 or Regional storm peak flow rate; and
- 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.

Hydrologic studies should describe the model parameters and criteria for their selection as well as input and output data. The developer's engineer has the responsibility for the computations, and the GB's Engineer shall check the main assumptions and the input data. All information required for this verification shall be submitted with the hydrologic computations. The developer's engineer shall undertake pre-consultation with the GB and the Conservation Authority to confirm the storm distribution and duration to be used.

Copies of the report, where required, shall be provided to the local Conservation Authority, MTO, and 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 guidelines for both pre-development and post development regimes.
- Run-off Quality Control
  - Address best management practices proposed to achieve desired treatment.
  - Make reference to the appropriate MECP design guide.
- 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 flow path (0.5m contours or better);
  - Show major storm route;

    - Comment on maintenance required to achieve assumed roughness on flow path; and
    - 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; and
    - 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.

Low Impact Development

Consideration should be given to Low Impact Development (LID) or Best Management Practices (BMPs) in the design and construction of stormwater management systems. LID practices incorporate “green infrastructure” such as infiltration basins, green roofs, bioretention swales, and rain gardens to support the functions of traditional “grey infrastructure” such as storm sewer pipes and outfalls. Implementation of LIDs are to be evaluated on a case-by-case basis since the selected practice will depend on geotechnical and other site specific conditions.

Drainage Areas

Drainage areas shall be delineated based on 0.5 meter or better contours/topographic data. Allowances shall be made for inflows from adjacent lands that naturally drain into or through the subject works and the system shall be designed to service all areas within the project to the maximum future development in accordance with the Official Plan and as reviewed with the GB.

Rainfall Intensity

The Intensity-Duration-Frequency (IDF) curve to be used for stormwater calculations will depend on the location of the development. Figure 4.1 shows the areas where the Goderich IDF and Stratford IDF curves should be used. The most recent data prepared by Water Services Canada shall be used. Both IDF curves may need to be referenced based on the location of the proposed development. It should be noted that development adjacent to Provincial Road Networks will require additional consultation with the Ministry of Transportation (MTO) as MTO has assigned IDF curves along their corridors that may differ and are a requirement to be used by the MTO.

Hydraulic Modelling

The stormwater management system shall be designed by using an approved hydrologic model, however, the Rational Method is acceptable for the sizing of the minor sewer system.

Run-off Quality Control During Construction

The GB requires developers, contractors and builders to plan and execute their operations so as to minimize sediment and debris pickup and transport to water bodies.

Hazard Lands and Floodlines

The GB requires that Hazard Lands be clearly defined on all watersheds and that no development other than necessary access or services be located therein. The GB 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

Watershed Area

The watershed area shall be determined from 0.5 metre (or better) contour plans and shall include all areas that naturally drain into the system, including fringe areas not accommodated in adjacent drainage systems, and any areas which may become tributary by reason of regrading.

Oil/Grit Separators (OGS)

Where the final SWM plan requires the use of an Oil/Grit Separators or other Manufactured Treatment Devices (MTD), it shall have Environmental Technology Verification (ETV) (or approved equivalent) certification of treatment efficiency. The GB reserves the right to specify approved MTD vendors.

Where the development involves gas stations, significant parking areas, loading and unloading at industrial areas, the potential for oil spill stand-alone treatment units may be preferred. The proposed unit (along with supporting design information) will be approved by the Technical Standards and Safety Authority (TSSA) and the GB for each installation. Infiltration measures will not be allowed in areas with significant potential for fuel spills, unless sufficient pre-treatment is provided to ensure compliance with MECP Reasonable Use guidelines.

4.4.3 Storm Sewer Design

The requirements for storm sewer design shall be in accordance with the latest edition of the MECP Design Guidelines, unless noted below.

Design Storm Events and Rainfall

a) Rational Method

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

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.).

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 as per the ranges summarized in Section 5. In all cases, gravel surfaces shall be treated as if they were asphalt or concrete.

A ten minute entry time at the head of the system must be utilized for the site.

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.

Minimum Size and Grades

Minimum pipe size for storm sewers and catch basin leads shall be 200 mm and designed with a minimum slope to provide the required flow velocities.

Sewer Pipe Materials

Concrete (Class 3 or better); Polyvinyl Chloride (PVC) Pipe (Flexible - Class SDR35 or Class V (320 kPa)); and Polyethylene Sewer Pipe (Flexible) – CSA certified Sewer Class to B 182.8 The GB shall be consulted for the material of any storm sewer > 600 mm or deeper than 5 metres.

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.

Foundation Drains

It is the GB's policy (as described herein) that foundation drains shall not be connected directly to the GB sewer systems.

Maintenance Holes and Catchbasins

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, where allowed, shall contain a sump of 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. Catch basins shall be 600 mm square concrete conforming to OPSD 705.01.

Open Channels, Ditches and Culverts, Municipal Drains

Where these elements are considered in conjunction with a site plan, the GB shall be consulted for input related to their design. Section 5 shall be referred to for technical requirements.

4.5 Site Grading

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

- Scale 1:250 (unless otherwise approved);
- All existing and proposed legal information;
- Any proposed structures (e.g., catch basins), pipes, top elevations and inverts;
- Location of service connections;
- Existing contours or spot elevations at maximum 0.5 m intervals, including elevations for adjacent properties;
- Existing and proposed elevations at lot corners;

- Specified building grades;
- Proposed parking and entrance grades;
- Proposed elevations along the boundary of all blocks abutting adjacent properties;
- Direction of the surface run-off by means of arrows; and
- All proposed easements required.

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.

Any regional flood, fill lines or erosion control lines shall be shown on the grading plans.

Grading Specifications

a)	Area Immediately Adjacent to Building	
	a. Unpaved:	2% minimum
	b. Paved:	1% minimum 5% maximum
	c. Landscaped Areas	2% minimum 3:1 maximum
b)	Parking Areas	3% maximum
c)	Internal Driveways	5% maximum
d)	Pedestrian Access	Refer to AODA requirements

4.6 Sanitary Servicing

Design

Where new service laterals are required they shall be designed and constructed in accordance with Section 5 and the current MECP design guidelines. The minimum size for services shall be 125 mm in diameter and for multiple dwelling, industrial or commercial buildings, the service connections shall be sized to accommodate the flow.

Pipe Material

Where new service laterals are required they shall be designed and constructed in accordance with Section 5. Service connections shall be P.V.C. (SDR28) or approved alternate. Where main sewers are required, the pipe shall be P.V.C. (SDR35) or approved alternate. All joints shall be of the rubber gasket type as approved by the GB. Approved caps shall be provided for service lateral terminations.

Construction

Sewer construction and pipe bedding shall conform to the requirements of OPSS 410 for sewer construction.

Sampling Manholes

Sanitary flows other than domestic sewage may require special provisions including sampling manholes for monitoring by the GB.

Abandoned and Existing Service Laterals

Service laterals which are to be abandoned are to be shown on the site servicing plan. The laterals will be excavated at the street line, inspected and sealed to the satisfaction of the GB.

Any existing laterals are to be shown on the site servicing plan. If it is proposed that they be re-used in connection with the proposed site plan, they are to be excavated at the street line and approved for such use only if they are found to be acceptable to the GB.

4.7 Water Servicing

Existing Water Services

Any existing water services are to be shown on the site servicing plan. An existing water service is not permitted to be reused where an existing building is to be demolished and replaced by a new building. In this case, the water service is to be abandoned by disconnecting the water service at the main. An existing water service can continue to be used where the development does not involve demolition of the existing building. The owner's engineering consultant should verify the capacity required for the proposed use in order to determine whether the existing service is adequate or not. Owners should exercise caution when reusing an existing water service and should verify its condition prior to constructing new surface works on top of it.

Water services which are to be abandoned are to be shown on the site servicing plan. Water services are to be disconnected at the watermain to the satisfaction of the GB.

Fire Flow Calculations

The consultant shall indicate whether fire protection is being provided by hydrants located within the municipal right of way, or by servicing on site. Where fire protection is to be provided by on site servicing (fire sprinkler system or private hydrants), fire flow calculations are to be included in the submission for site plan approval. This should include assessment of the impact of backflow preventers, which are required on fire sprinkler systems, and may have significant headloss. The designer is advised to obtain information for the device proposed for use in order to confirm that adequate pressures and flows will be available.

New Water Services

The site servicing drawings are to indicate the proposed onsite water servicing. The drawings shall indicate the connection to the municipal system, the size of the watermain and the location and routing of the private water main, valving, locations of water meters, hydrants, fire sprinkler systems, and backflow preventers and all other information required. The drawings should also indicate fire flow and domestic water demand requirements.

If the results of hydrant flow tests are to be used in the design of fire sprinkler systems or domestic water supply, the GB should be consulted to confirm available pressures and flows at the watermain under the design conditions of the water distribution system. Adjustments should be made since flow tests are not usually done at design conditions. Designers should also be aware of losses/pressure drops in the private water systems due to the use of backflow prevention devices or friction losses in the service. The designer shall consider water quality in the design of the private water servicing.

Metering

Water meter sizes shall be determined based on flows. The sizing of the water meter may vary significantly from the service size. The designer shall provide information with the application which addresses any flows that go through the meter including domestic flows and fire flows, if applicable, for review of meter sizing by the GB.

Disinfection, Testing, and Flushing

The requirements of the Building Code and Section 5 shall apply.

5.0 OFF-SITE OR WORKS TO BE ASSUMED - TECHNICAL SPECIFICATIONS

5.1.1 Purpose

The purpose of this document is to aid in the standardization for the design of municipal servicing infrastructure for development in the County. While these guidelines are primarily aimed at the expansion of residential development, developers, builders, and the general public can use this document as a guide for developments created by consent, for individual site developments, or commercial and industrial areas.

This section includes technical specifications related to:

- Roads;
- Entrances;
- Parking;
- Stormwater;
- Sanitary sewers;
- Watermains;
- Utilities and street lighting;
- Parkland and landscaping;
- Traffic and street signs; and
- Asset management.

5.1.2 Design Guidelines

The guidelines 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 guidelines. These deviations shall only be made through consultation with the GB and/or their representatives. Further, the GB reserves the right to require compliance to a higher standard on occasions where warranted (dependent upon the specific details of any development). Further, the GB may require higher standards in areas of higher density developments, arterial or collector roads, or heavy industrial traffic.

These guidelines should be read in conjunction with the standard engineering practice as established by the MECP and MTO together with regulations, the current drinking water license, design manuals and guidelines of the Municipal Engineers' Association. Unless superseded by the GB's own Development and Servicing Guidelines 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). Road Specifications

5.2 Road Specifications

5.2.1 General

All local roadways for residential development shall be designed and constructed to the urban standard and the typical cross section of the GB. The following shall apply:

- Minimum 20 metre wide road allowances;
- Minimum 9 metres radius at intersections;
- Private access roads, 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 (MTO) Geometric Design Guidelines (TAC Geometric Design Guide);
- 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 13 metres; and
- Minimum road asphalt width shall be 8.5 metres. The finished roadways shall have a cross-fall of 2% from the centerline to each curb line.

Should the development require the construction of arterial or collector roads, the GB will establish design widths for that section of road if required. Roadway pavement and road allowance widths for industrial, commercial, or rural development shall be established in consultation with the GB. New roads should also include active transportation considerations, including cycling infrastructure and pedestrian facilities.

A qualified geotechnical firm shall be engaged by the developer's engineer to confirm the suitability of the minimum pavement designs contained in these guidelines 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 for acceptance, the asphalt pavement mix designs.

5.2.2 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 GB may give permission to leave trees on the street allowance, providing that they are situated more than 1.5 metres behind the curb. There may be restrictions on when tree clearing can occur, per the Migratory Birds Convention Act. Generally, tree clearing should be done between September and April.

5.2.3 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 GB. 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.

5.2.4 Road Construction

All road construction shall conform to applicable standards of the Ontario Provincial Standard Specifications (OPSS) and the Ontario Provincial Standard Drawings (OPSD).

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 GB reserves the right to require video inspection of subdrains prior to acceptance.

5.2.5 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 GB). Following at least one year from the date of placement of the base asphalt, the developer shall arrange an inspection 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 the surface coat of asphalt shall be placed. Asphalt work shall conform to OPSS 310.

5.2.6 Curbs

Concrete curb and gutter, of cross-section approved by the GB, 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. All curb and gutter is to be protected from damage by heavy equipment and vehicles. Two stage curb is not permitted.

5.2.7 Sidewalks

A 1.5 metre (minimum) wide sidewalk shall be constructed on one or both sides of each street for residential development and both sides of each street for institutional, commercial and industrial developments, as per the requirements of the GB. 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 or concrete driveways.

5.2.8 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 GB and

the Province of Ontario's current accessibility standards and regulations to provide full access where possible, to all individuals in the community.

The proposed work activities and design details are subject to review by the GB. The design may be asked to be modified based on recommendations presented by the County Accessibility Committee.

5.2.9 Turning Circles

Where construction is phased, the GB 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 4.2.1 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 or drainage outlets.

5.2.10 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.

5.2.11 Daylighting Requirements at Intersections

Where deemed necessary, 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.

5.2.12 Location of Utilities

The location of utilities within the road allowance shall be as detailed on the GB's standard drawings. Utility drawings shall be submitted to the GB for acceptance of the proposed utility locations. All utility wiring is to be housed underground or direct 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 standard drawing and are typically to be located in the opposite boulevard of the sidewalk. Telecommunication (telephone, cable TV and internet) junction boxes may be mounted at the surface in accepted standard enclosures.

5.2.13 Community Mail Box Requirements

Community mail centres and/or site individual super mail boxes shall be placed in locations accepted by the GB. 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 GB 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. 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.

5.3 Stormwater Management – Design Guidelines

These drainage policies will apply to all development or redevelopment requiring planning approvals. Stormwater quantity and quality must be satisfactorily addressed on all projects. The requirements of the GB, MECP and Conservation Authority will apply. Stormwater management should conform to any applicable sub-watershed study or master drainage plan. It is expected that technical design aspects for stormwater management will be detailed in a Stormwater Management Report as per Section 3.1 of this Guide.

In addition to the information provided herein, the latest versions of the following documents are to be used collectively to provide guidance and SWM criteria, necessary to implement a holistic treatment train approach to stormwater management in the area:

- Conservation Authority Stormwater Management Technical Guide; and
- MECP Stormwater Management Planning and Design Manual (2003).

5.3.1 Drainage Objectives

The GB will set the following objectives for the management of storm drainage within its boundaries:

- Reduce to (individually) acceptable levels, the potential risk of loss of life, health hazards, 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; and
- Maintain, where applicable, any natural stream channel geometry insofar as it is feasible while achieving the above objectives.

5.3.2 Attainment of Drainage Objectives

Major and Minor Systems

In general, the GB 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.

Run-off Quality Control During Construction

The GB 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 guidelines of the MECP, MNRF, MTO, and local conservation authorities. The GB will require all erosion control works to be properly maintained throughout the duration of the project.

Drainage Areas

Drainage areas shall be delineated based on 0.5 meter or better contours/topographic data. Allowances shall be made for inflows from adjacent lands that naturally drain into or through the subject works and the system shall be designed to service all areas within the project to the maximum future development in accordance with the Official Plan and as reviewed with the GB. The Stormwater Management design must account for the safe conveyance of the greater of the runoff rate generated during the 1:100 year storm or Regional event from the development area and external catchments draining through the property; additionally, the design shall determine & provide for the worst case scenario, particularly where interim or ultimate conditions will result in increased flows. In addition, the design must be completed to ensure that there are no negative impacts to owners of upstream or downstream lands occurring as a result of the Works, under ultimate as well as interim conditions. The exact location for connecting sewers or channels to adjacent sewers or areas shall be approved by the GB.

The Intensity-Duration-Frequency (IDF) curve to be used for stormwater calculations will depend on the location of the development. Figure 4.1 shows the areas where the Goderich IDF and Stratford IDF curves should be used. Depending on the location of the proposed development a blend of the two curves may be appropriate. Note that the MTO may require the use of IDF curves assigned to their regulated areas which will differ. MTO should be consulted directly if the proposed development is adjacent to a Provincial Road.

Master Drainage Plans

The GB 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, to identify constraints & opportunities, and to determine the solution that is compatible with the objectives for the watershed. Potential constraints include downstream flow restrictions necessitating a lower (quantity) release rate, and/or instream erosion sensitivity requiring increased extended detention, amongst other factors. Conversely, potential opportunities are shared Stormwater Management facilities, and/or enhanced downstream conveyance to mitigate existing flooding and quantity storage requirements, amongst other factors.

5.3.3 Major System

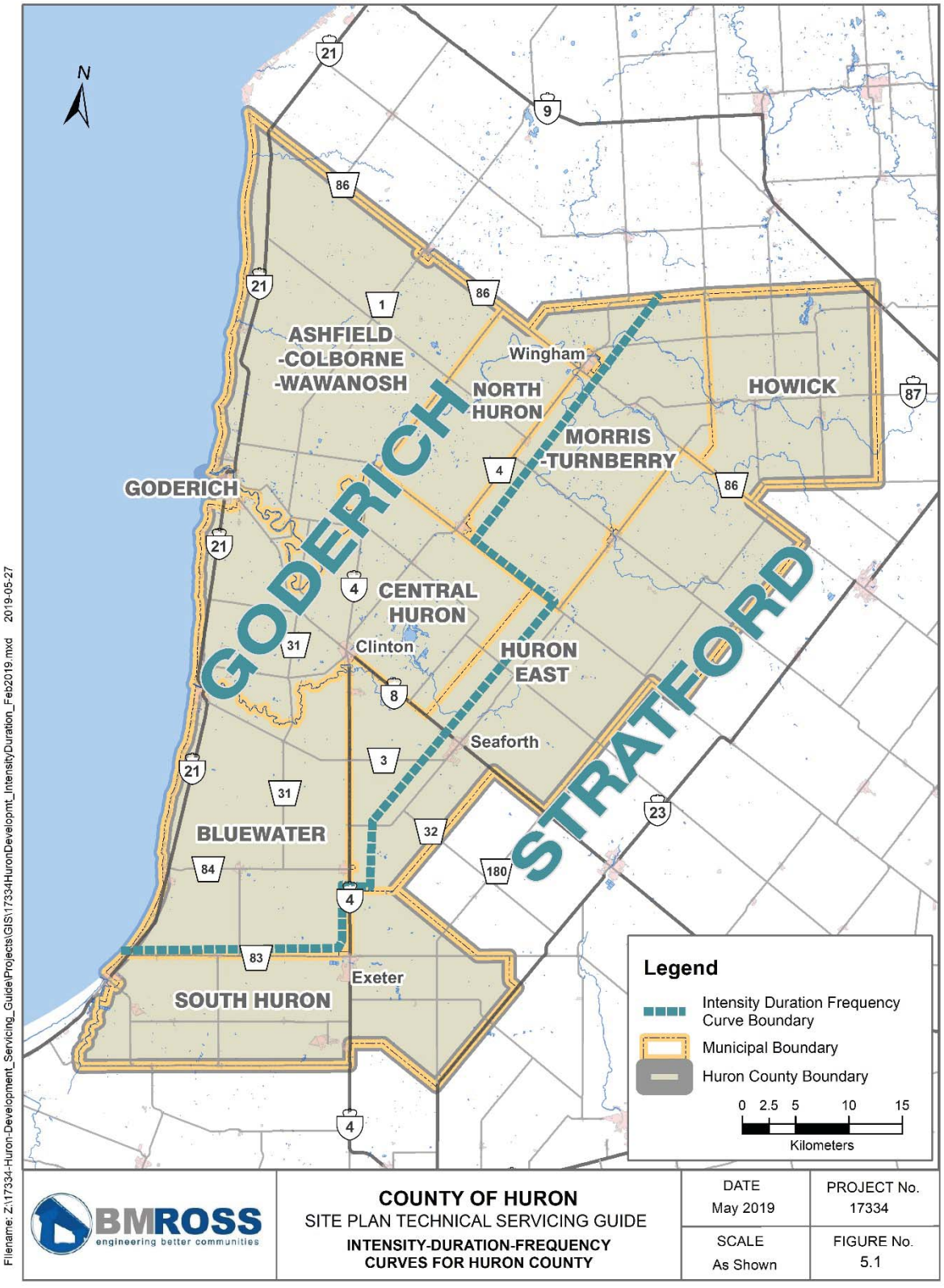
Hazard Lands and Floodlines

The GB requires that Hazard Lands be clearly defined on all watersheds and that no development other than necessary access or services be located therein. The GB 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

Stormwater Management Facilities

Where stormwater management facilities are to be implemented, they shall incorporate a water resources management approach, be consistent with the ecosystem and shall be created in a

Figure 5.1 Intensity Duration Frequency Curves for Huron County



manner that is the technically sound, aesthetically pleasing, ecologically diverse and where passive and active pursuits may be realized in a generally safe environment. Creatively designed and developed, these facilities will comply with and satisfy the required stormwater management functions while providing as a significant asset to the open space system within the community.

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

Native and non-invasive trees, shrubs, ground covers and aquatic plants shall be provided as part of the Landscape Plan in a low maintenance landscape design which has regard for the ecology of the site and the eco-region. Facilities and landscaping shall be designed to support continued maintenance requirements.

5.3.4 Minor System

Watershed Area

The watershed area shall be determined from 0.5 metre (or better) contour plans and shall include all areas that naturally drain into the system, including fringe areas not accommodated in adjacent drainage systems, and any areas which may become tributary by reason of regrading.

Storm Drainage Plans

Storm sewers, or ditches 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 or ditch, drawn to the same scale as the roads, showing pipe bedding, maintenance holes, culverts, and other appurtenances. Design (including all drawings and calculations) of the proposed works must be submitted to the GB and applicable government agencies for approval. Plans of the entire system shall be submitted to the MECP for approval. Approval for construction will not be given until all Environmental Compliance Certificates have been received from the MECP and all other applicable government agency approvals have been received.

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 GB 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 or ditch 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.

Generally, rain water leaders shall not be connected directly to the storm sewer system and shall be constructed in a manner so as to not interfere with adjacent properties.

Sump pump discharge shall not be directed over sidewalks and should discharge to the rear yard. Direct connection of foundation drains to storm sewers is not allowed, unless the calculated 1:100 year hydraulic grade line in the receiving storm sewer is demonstrated to the satisfaction of the GB to be a minimum of 1 metre below adjacent house footing elevation(s).

5.3.5 Hydraulic Design

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 for the area.

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 larger areas (in excess of 10 ha.), involving dual drainage design, or involving treatment and/or storage systems.

Hydraulic Modelling

The stormwater management system shall be designed by using an approved hydrologic model.

Stormwater Management Report

A Stormwater Management Report setting out the existing and proposed drainage pattern shall be submitted to and approved by the GB, the Conservation Authority and the MECP.

The stormwater management requirements within the area shall be in-line with the following general requirements:

- Quality and quantity control – as dictated by the GB, local Conservation Authority and/or the MECP. Quantity control shall restrict post-development runoff flows to pre-development flows between the 1:2 and 1:100 year / Regional storm events;
- Downstream Conveyance capacity shall be reviewed prior to proceeding to detailed design work. Limitations will be discussed with the GB and the Conservation Authority. Generally, either capacity to an adequate outlet must be provided, or post development flows limited to the site's pro-rata share of available capacity, with available capacity being defined as the flow rate that does not cause flooding. Where informal / de-facto attenuation/storage is occurring on a site, pre-development runoff rate calculations, shall incorporate the de-facto attenuation/storage;

- The design storm for the minor systems shall be the 1:5 year storm for local storm sewers and the 10 year storm for trunk facilities. The major system shall be designed to convey the greater of the 1:100 or Regional storm peak flow rate; and
- 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.

Hydrologic studies should describe the model parameters and criteria for their selection as well as input and output data. The developer's engineer has the responsibility for the computations, and the GB's Engineer shall check the main assumptions and the input data. All information required for this verification shall be submitted with the hydrologic computations. The developer's engineer shall undertake pre-consultation with the GB and the Conservation Authority to confirm the storm distribution and duration to be used.

The developer shall ensure that the GB is aware of any requirements that the Conservation Authority may have so that they can be reviewed, discussed, and revised should the GB deem it necessary.

Copies of the report, where required, shall be provided to the local Conservation Authority and 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 guidelines for both pre-development and post development regimes.
- Run-off Quality Control
  - Address best management practices proposed to achieve desired treatment.
  - Make reference to the appropriate MECP design guide.
- 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 flow path (0.5m contours or better);
  - Show major storm route;
  - Comment on maintenance required to achieve assumed roughness on flow path; and
  - 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; and
  - 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.

Oil/Grit Separators (OGS)

Oil/Grit Separators or other Manufactured Treatment Devices (MTD), shall have Environmental Technology Verification (ETV) (or approved equivalent) certification of treatment efficiency. The GB reserves the right to specify approved MTD vendors.

Where the development involves gas stations, significant parking areas, loading and unloading at industrial areas, the potential for oil spill stand-alone treatment units may be preferred. The proposed unit (along with supporting design information) will be approved by the Technical Standards and Safety Authority (TSSA) and the GB for each installation. Infiltration measures will not be allowed in areas with significant potential for fuel spills, unless sufficient pre-treatment is provided to ensure compliance with MECP Reasonable Use guidelines.

5.3.6 Storm Sewer Design

The requirements for storm sewer design shall be in accordance with the latest edition of the MECP Design Guidelines, unless noted below. The GB may require a larger storm sewer size on parts of the subdivision than required for the subdivision alone. Cost sharing for upsizing to serve external areas will be based on nominal additional pipe size.

Design Storm Events and Rainfall

a) Rational Method

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

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.).

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 – 0.40
- Commercial 0.75 – 0.85
- Industrial 0.65 – 0.75
- Residential:
    - Single Family 0.40 – 0.50
    - 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 fifteen 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).

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:

- Concrete/Plastic pipe all sizes 0.013
- Corrugated Steel (culverts only) 0.024

Flow Velocities

Minimum → 0.80 m/s

(note that other lower velocity standards do exist and may be acceptable to the GB on a case-by-case basis).

Maximum → 6.00 m/s

Minimum Sizes

Minimum pipe size for storm sewers and catch basin leads shall be 300 mm

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 Metre
300 - 375	0.50
450 - 525	0.30
600 - 900	0.20
> 975	T.B.D.

Minimum Cover

The depth of storm sewers shall be sufficient to allow for the drainage of adjacent properties having internal stormwater management systems outletting to the mainline system. The minimum cover to the top of the outside pipe barrel shall be no less than 1.5 m from the centerline of the roadway. In cases where the road centerline is no longer relevant, minimum cover to the top of the outside barrel shall be no less than 1.3 m. Provisions are typically not required for downspout or direct foundation drain collection, as neither is a usually a permitted connection to the storm sewer. However, connections may, at the GB's discretion, be permitted for sump pump discharge, and on an individual case basis in high density developments, at the GB's discretion, where a safety hazard will otherwise be created, for downspouts.

Location

Any storm sewers within road allowances shall be located as shown on the standard road cross section drawings.

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 (e.g., maintenance hole knock-outs, sewer stubs, etc.).

Sewer Alignment

All storm sewers under 1500 mm diameter shall be laid in a straight line between Maintenance Holes. Radius pipe may, at the GB's discretion, be accepted, for storm sewers 1500 mm and greater.

Pipe Crossings

A minimum clearance of 0.30 metres shall be provided between the outside of all pipes barrels at all points of crossing. In the event of watermain crossing, MECP 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.

Changes in Pipe Size

No decrease of (equivalent) pipe size from a larger upstream pipe to a smaller downstream size will be allowed regardless of the increase in grade, except, at the GB's discretion, where inverted siphons are proposed.

Sewer Pipe Materials

a) Concrete Sewer Pipe (Rigid)
   - 150 mm to 375 mm Class 3; and
   - 375 mm or greater as specified in the tender form.

b) Polyvinyl Chloride (PVC) Pipe (Flexible)
   - Class SDR35 or Class V (320 kPa); and
   - Annular ribbed profile for ribbed pipe.

c) Polyethylene Sewer Pipe (Flexible) – CSA certified Sewer Class to B 182.6
   - 150 mm to 600 mm; and
   - 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 GB shall be consulted for the material of any storm sewer > 900 mm or deeper than 5 metres.

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”.

Foundation Drains

It is the GB’s policy (as described herein) that foundation drains shall not be connected directly to the GB sanitary or storm sewer systems. The foundation/sump pump system shall discharge to a concrete splash pad in a landscaped area with the water directed to rear yard swales. Sump pump discharge shall not be directed over sidewalks or foot paths due to winter icing hazards. Foundation drain discharge water that becomes a nuisance shall be corrected.

Where connections to the storm system are available (typically only in urban, high density locations) sump pump discharge shall be directed to a residential storm service connection, as discussed in the following section.

The geotechnical report shall consider the ground water table elevation and recommend minimum basement elevations. Basement floor slabs must be a minimum of 0.3 m above seasonal high ground water table.

Private Drain Connections

Private storm service drain connections (PDC) will only be allowed where it is demonstrated, to the GB’s satisfaction, that due to individual site characteristics, sump pump discharge will create a significant nuisance and/or a (winter icing) safety hazard. Where allowed, PDC’s shall be installed at a minimum depth of 1.5 m. Roof leaders/eavestrough connections will be not be permitted to the PDC’s.

Residential storm connections shall be PVC 100 mm SDR28 colour white. The ends of all services shall be marked by a 50 mm x 100 mm wood post extending from the service to 300 mm above the surface of the ground and the top section painted a different colour than water (blue) and sanitary (green) service markers.

5.3.7 Maintenance Holes and Catch Basins

Concrete Maintenance Holes shall be provided at all changes in direction of the sewer and at all street intersections. 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, where allowed, shall contain a sump of 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 moduloc pre-cast units, which shall be parged on the outside face. All maintenance holes located within the travelled portion of the roadway shall have the rim elevation set flush with the surface of the base course of asphalt. The setting of the frame and cover shall be constructed in accordance with OPSD 704.010.

Catch basins shall be provided on both sides of the street at all low areas but no further apart than noted below. 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.

Maintenance Hole 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.

Maximum Spacing of Maintenance Holes

Maintenance Hole spacing shall be as per MECP Design Guidelines, however, for sewers 750mm or less in diameter the spacing shall not exceed 100 m. For sewers 825mm to 1200mm the spacing shall not exceed 125m.

Maintenance Hole Types

Maintenance Holes may be constructed of precast 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.

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. The type of drop structure (internal or external) shall be selected in consultation and with approval from GB.
c) All storm sewer Maintenance Holes shall be benched in accordance with the OPS Drawings.
d) Structures to include frost straps to OPSD 701.100

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. 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.

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.

Where a change of direction through the Maintenance Hole is not provided, the minimum drop is to be 20mm. Where there is a change in direction across Maintenance Holes, the minimum drop shall be as follows:

Change of Direction	Minimum Drop (mm)
1 to 45 degrees	50 mm
46 to 90 degrees	60 mm

Catch Basin Location and Spacing

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

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 does not exceed 95 metres, subject to the analysis of the major – minor system.

Rear lot catch basins and connections, which are not permitted unless discretion has been granted from the GB, shall be located as outlined in the lot grading criteria and in all cases shall discharge/connect to a structure. Rear yard catch basins shall be benched.

Catch Basin Types

Catch basins must be of the precast type with full depth sumps (600mm), as shown on the OPS Drawing 705.010. Special catch basins and inlet structures shall be fully designed and detailed by the Consulting Engineer.

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%

Catchbasin leads shall be connected to the main storm sewer through a maintenance hole (with appropriate benching in the maintenance hole) except where the main sewer size is 900 mm or greater in diameter, in which case the lead can be connected directly to the main sewer in the top half of the pipe using saddles and straps. Long catchbasin leads in excess of 90 meters shall be connected to a maintenance hole.

Catchbasin maintenance holes (CBMH) are not preferred. Catchbasins are not to be used in series and local stormwater systems are only to connect to a maintenance hole structure (minimum 1200 mm diameter) or mainline tee.

Catch Basin Frame and Covers

The frame and cover for catchbasins shall be as per OPSD. In general, OPSD 400.120 shall be installed for all catchbasins located within the roadway, rear yard applications (when permitted), pedestrian pathways or parkland.

OPSD 403.010 shall be installed for all ditch inlet catchbasins.

“Birdcage” style grates as per OPSD 400.120 shall be used in rear yard catchbasins (when permitted) or as indicated by the GB.

Catchbasins, and other Inlet structures with grates shall be designed to allow entry of design flow at 50% blocked, as per MTO requirements. Where an inlet or catchbasin receives open channel flow that may be subject to debris, the GB may specify a custom grate and a larger lead size.

Testing and Flushing of Sewers

The complete storm system, including drain connections, shall be tested (infiltration / exfiltration / deflection), and flushed in accordance with OPSS 410, including video inspection. The developer shall arrange the tests for sections of sewer between Maintenance Holes and shall inform the GB when a section is on test and ready for inspection. Sewers shall be video inspected at least twice by the developer, once immediately prior to base asphalt and once immediately prior to Final Acceptance, and in accordance with the Development Agreement. Any sections of sewer which fail to meet the requirements of this section shall be repaired and retested.

5.3.8 Inlets, Outfalls and Special Structures

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.

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.

Open Channels

The proposed criteria for an open channel shall be submitted to the GB for his approval. The developer’s 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 applicable Conservation Authority's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses regulation. Planned watercourse alterations may, in addition, be subject to other Agency requirements (Department of Fisheries and Oceans, Canada (DFO), MNRF, Navigable Waters (Transport Canada), Drainage Act, etc.).

Ditches and Culverts

Ditches and driveway culverts shall be sized to convey a 1:5 year storm. Road crossing culverts to be designed to convey a 1:25 year storm on Local and Collector roads and 1:100 year storm on Arterial roads. Where curb and gutter are not required, ditches shall be constructed as follows:

a) Culverts shall be constructed with low point of entrance or road over culvert;
b) Ditches shall be constructed to contain the 1:5 year storm event without flooding the road surface;
c) Ditch invert depth below finished centreline grade shall be:
    - Maximum 1.5 m
    - Minimum 200 mm below bottom of granular to drain roadbed
d) Ditch grade shall be:
    - Maximum 6 %
    - Minimum 0.5 %, 1.0 % in areas of high ground water
e) In exceptional cases and where ditches are on easements off the road allowance, ditches with grades greater than 6 % may be allowed but these shall be suitably protected against erosion by such means as rip-rap or gabions; and
f) Ditches through easements exceeding 1.8 m in depth shall be constructed with 4:1 side slopes, or, in exceptional circumstances, at the GB's discretion, fenced off with standard 1.8 m high chain link fence.

The minimum ditch protection on all ditches shall be 100 mm of topsoil and staked sod on the side slopes and bottom of the ditch. The GB may consider the use of seed and mulch in place of nursery sod.

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

- Minimum Length - as required from centre of ditch to centre of ditch;
- Minimum Size - 600 mm diameter;
- Material - galvanized corrugated steel pipe;
- Wall Thickness - as recommended by manufacturer for deep pipes, minimum wall thickness 2.0 mm (14 gauge);
- Cover - 300 mm minimum; and
- Bedding - Culverts shall be bedded and backfilled with granular material in accordance with OPS.

Where it is necessary to construct culverts under roadways or driveways larger than the minimum size, the cross-sectional end area shall be calculated by an approved method as noted previously. The culverts should be of reinforced concrete or plastic and detail drawings and calculations shall be submitted for the approval of the GB. Note that corrugated steel may be acceptable to the GB if requested.

Driveway entrance culverts shall have a minimum diameter of 500 mm, a minimum wall thickness of 2.0 mm (14 gauge) and a minimum length of 7 m. Culverts for fire hydrant ramps, if required, shall have a minimum diameter of 500 mm and a minimum wall thickness of 2.0 mm (14 gauge). Larger diameter culverts may be required based on storm water management analysis.

In all cases culvert sizing & length shall be shall be calculated by an approved method, with end treatments consisting of headwalls, bevelled, or flared ends, being required unless otherwise authorised by the GB.

Municipal Drains

Where development proposals include any sort of alterations to a municipal drain, the laws, regulations and specifications of the Ontario Municipal Drainage Act shall be strictly adhered to and the design specified by the Engineer's report for the Municipal Drain shall be met.

5.3.9 Operation and Maintenance Manual

Prior to approval of the works an operation and maintenance (O&M) manual shall be provided. This manual shall describe the works and equipment, include shop drawings, address the obligations for maintenance, outline the appropriate tasks, and shall provide the frequency of maintenance measures required. Provide two hardcopies and an electronic PDF copy of the O&M manual.

5.4 Sanitary Sewers

5.4.1 Approval of Plans

Plans of the entire system shall be submitted to the MECP for approval following acceptance of the plan by the GB. This submission shall consist of an overall plan, a plan and profile of each main sewer drawn to the same scale as the roads, together with typical details of house service connections, pipe bedding, Maintenance Hole covers, all special bends and connections and other appurtenances. Approval for construction will not be given until the Certificate of Approval for all infrastructure and facilities has been received from the MECP.

5.4.2 Location

The main sewers shall be located along the centre of the street allowance. House connections shall terminate at the property line for each lot.

5.4.3 Material

Main sewers shall be P.V.C. (SDR35) or approved alternate. House connections shall be P.V.C. (SDR28) or approved alternate. All joints shall be of the rubber gasket type as approved by the GB. Approved caps shall be provided for service lateral terminations.

5.4.4 Design Standards

Sanitary service shall be designed in accordance with current MECP design guidelines.

The minimum size for main sewers shall be 200 mm diameter. House connections shall be a minimum of 125 mm in diameter. For multiple dwelling, industrial or commercial buildings, the service connections shall be sized to accommodate the flow.

5.4.5 Sanitary Sewer Construction

Sewer construction and pipe bedding shall conform to the requirements of OPSS 410 for sewer construction. A minimum 2.5 metre depth of cover shall be provided over all sanitary sewers and service laterals.

5.4.6 Sewer Connections

Plan locations and invert elevations, for all house connections at the street line, shall be shown on the drawings. Minimum fall on house connections shall be 2%; maximum 8%. Where the depth of sewer is excessive, a riser may be used over the main sewers. Shop manufactured "Tee" connections shall be used for house connections to the main sewer. Each service lateral shall be complete with a manufactured "Wye" connection and 100 mm diameter cleanout that shall extend to the ground surface level. The top of the cleanout shall be installed flush with the ground surface 300 mm outside the lot line complete with a bolted cap (Malcolm or approved equal), clearly marked "Sewer", attached using a PVC fitting. Flexible couplings should not be used to connect the bolted cap to the cleanout. A P.V.C. gasketed cap shall be installed on each service lateral termination at the street line and made watertight. The ends of all services shall be marked by a 50 mm x 100 mm wood post extending from the service to 300 mm above the surface of the ground and the top section painted fluorescent green. Connections to Maintenance Holes shall enter the structure no higher than 0.5 m above the lowest invert, except as otherwise approved by the GB.

5.4.7 Grinder Pumps

Should the development require the use of Grinder Pumps, they shall be E-One sewer systems curb stop c/w integral stainless steel check valve equivalent. Service box to have stainless steel stem. Isolation valves to be located at the property line of each service. Valve box covers to be stamped "SEWER".

Service pipe to be 32 mm (minimum), Polyethylene (PE) DR-11 tubing, compression joint connections for PE service pipe requires a stainless steel tube liner with a fluted end as supplied by the corporation stop manufacturer.

Should grinder pumps be required, more detailed design, material and installation specifications will be provided by the GB.

Grinder pumps shall remain in the ownership of the private property owner. The property owner shall be responsible for all operating, maintenance, repair and replacement costs.

5.4.8 Maintenance Holes

Concrete Maintenance Holes shall be provided at all changes in direction of the sewer and at all street intersections, but no further apart than 120 m. Maintenance Holes shall be 1200 mm dia. conforming to OPSD 701.010 or as required for larger trunk sewer sizes. Benching shall be provided in all structures.

5.4.9 Testing and Flushing of Sewers

The complete sewer system, including house connections, shall be tested (infiltration / exfiltration / deflection), and flushed in accordance with OPSS 410, including video inspection. The developer shall arrange the tests for sections of sewer between Maintenance Holes and

shall inform the GB when a section is on test and ready for inspection. Sewers shall be video inspected at least twice by the developer, once immediately prior to base asphalt and once immediately prior to surface asphalt placement. Any sections of sewer which fail to meet the requirements of this section shall be repaired and retested.

5.4.10 Completion and Acceptance

The complete sewage collection system installation must be approved by the GB prior to the issuance of building permits for the subdivision.

5.5 Watermains

5.5.1 Approval of Plans

Plans of the entire system shall be submitted to the GB for approval and prepared in accordance with the MECP Guidelines and the Municipal Drinking Water Licensing Program (as applicable). The developer shall provide a complete MECP Form 1 – Record of Watermains (and any supporting information) for any addition to, or alteration of municipal-owned water distribution systems.

The submission shall consist of an overall plan, a plan and profile of each watermain drawn to the same scale as the roads, together with typical details of house service connections, pipe bedding and other appurtenances. Approval for construction will not be given until all the requirements of the MECP and the Municipal Drinking Water Licensing Program are fulfilled and the necessary approvals received.

5.5.2 Locations

Watermain: The watermain shall typically be installed within the road allowance, in accordance with the GB's Typical Cross-Section.

Service Lines: In general, house services shall not be installed in driveways. Where the driveway location is unknown at the time of watermain construction, service connections shall terminate at the property line at the centre of each lot.

Main Valves: To be located at the extension of property line, where the valve is being installed at intersections.

Curb Stops: To be provided for each service connection and to be located at the lot line.

Hydrants: Fire hydrants shall be installed at the end of cul-de-sacs and other permanent dead-end watermains. They are preferred to be located at street intersections, same side as the watermain, consistent side of road, property lines, high points, low points, and should have 2.0 metres of clearance on either side from obstructions and clear to the curb line at the front.

5.5.3 Design

Watermains shall be designed in accordance with current MECP design guidelines. Minimum distribution pipe size shall be 150 mm diameter. Watermains shall be looped to existing municipal systems.

5.5.4 Materials

All materials for watermains, valves, valve boxes, etc. shall be supplied by the Contractor. All materials supplied under this contract shall comply with the latest edition of the applicable AWWA standard. Oils and lubricants used in assembly shall be 'Food Grade' and shall comply with the latest edition of NSF/ANSI Standard 61.

Watermain materials shall be as per the material list provided by the GB. No substitutions shall be considered without the GB's approval. The following is provided for general guidance only.

Watermain

Watermain material shall be Polyvinyl Chloride PVC DR18 – AWWA C900 or C905. Pipe joints shall be bell and spigot with rubber gaskets.

Minimum size – 150 mm. Minimum depth of cover as per GB.

Fittings

Fittings shall be ductile iron cement mortar lined mechanical joint (MJ) type conforming to AWWA C110 and AWWA C111 or PVC, conforming to AWWA C907, with adaptors to suit other materials, where necessary. Ductile iron fittings to be bonded or have lead tip gaskets used.

Gate Valves

Valves shall be resilient – seated gate valves. Main line valves to be MJ type with standard operating nut. Hydrant valves to be MJ to MJ gate valve with standard operating nut.

All valves to be supplied with "O" ring packing for water use and **open as per the GB's preference**.

Valve boxes must meet with approval of the Operating Authority.

Tapping valves and sleeves must meet with approval of the Operating Authority.

Resilient-seated gate valves shall be in accordance with AWWA C509.

Hydrants

Fire hydrants shall meet the requirements of the GB.

Dry barrel hydrants shall be in accordance with AWWA C502.

All hydrant legs shall be 150 mm diameter and shall be supplied from watermain of not less than 150mm diameter.

Water Services

Water Services shall meet the requirements of the GB including the following:

- Main Stops – Full port ball with C.C. thread inlet/compression joint outlet.
- Curb Stop - Full port ball valve with compression joint inlet/compression joint outlet.
- Pipe shall include the installation of tracer wire.
- Service tubing shall be installed to a minimum depth of 2.0 m cover.

- Service Boxes - Service box with 25 mm steel upper section. Box lids shall be regular ribbed with brass pentagon plugs.
- Service Saddles
- Couplings to be compression style.

Underground service line valves and fittings shall be in accordance with AWWA C800.

Model numbers shall be stamped on all valves and materials.

Cathodic Protection

Unless noted otherwise by the GB, cathodic protection shall be in accordance with OPSD 1109.011 and as noted below:

Appurtenances	Method of Protection
i) Piping	Not required.
ii) Hydrants	One anode per each (see hydrant standard drawing OPSD 1105.010).
iii) Services • Each copper service	 One anode per each service. One anode installed per each curb stop and main stop.
iv) Valves	Sacrificial zinc nuts.
v) Fittings (epoxy coated) Fittings (no coating)	Sacrificial zinc nuts One anode per each or sacrificial zinc nuts.

- Anode sizes shall be 5.5 kg for watermain appurtenances up to and including 300 mm diameter and 11.0 kg for watermain appurtenances greater than 300 mm.
- Anodes for steel pipe encasement shall be 11.0 kg for all sizes.
- Sacrificial zinc nuts shall be of the protecto-cap type and installed on each bolt.

Saddles

To be stainless steel (18 gauge min.), double bolted with a band width equal to or greater than the diameter of the watermain.

Tracer Wire

All watermain to be provided with a Type TWU No. 12/7 strand copper cable having thermoplastic insulation rated for underground use and strapped to the top of the pipe every 5.0 metres with a brass or galvanized clamp.

Thrust Restraints

Unless noted otherwise by the GB, OPSS 441.07.23 is amended to the following insert:

- All thrust restraint shall be designed to adequately provide the minimum amount of pipe/joint restraint required by mechanical joint restraint device alone. Concrete thrust blocks are not an accepted method of thrust restraint in the GB except for connections to an existing main as directed by the Operating Authority or their designate;
- Design of the pipe joint restraining systems shall consider the pressures that the system will be subjected to as well as any expansion and contraction due to temperature changes during and following construction of the various pipe materials selected;

- Restrain lengths for watermain 100 mm to 300 mm shall be in accordance with the requirements outlined below. Restrained length calculations for watermains 400 mm and greater shall be supplied by the pipe manufacturer using the design criteria set out below;
- Thrust restraint shall be provided at all fittings, bends, tees, valves, hydrants, crosses, reducers, and plugged or capped dead ends;
- For DI pipe refer to AWWA C600 – Section 3.8. For PVC pipe refer to UNI-BELL and AWWA M-23; and
- Hydrants shall be restrained with mechanical thrust restraints.

Design Criteria (Thrust Restraint):

- All inline valves up to 300 mm in size shall be mechanically restrained and as well one (1) full pipe length (6 m) on each side of the restrained valve must be mechanically restrained with a minimum of two (2) steel rods to be used on the restraints;
- All bends up to 200 mm in size must be mechanically restrained and as well one (1) full pipe length (6 m) on each side of the restrained bend must be mechanically restrained with a minimum of two (2) steel rods to be used on the restraint;
- All bends from 250 mm to 300 mm in size shall be mechanically restrained and as well two (2) full pipe lengths (12 m) on each side of the restrained bend must be mechanically restrained with a minimum of four (4) steel rods to be used on the restraints;
- All dead ended watermains up to 200 mm in size cap and or plug shall be mechanically restrained and three (3) full pipe lengths (18 m) must be restrained prior to the end of that watermain with a minimum of two (2) steel rods to be used on the restraints;
- All dead ended watermains 250 and 300 mm in size cap and or plug shall be mechanically restrained and as well five (5) full pipe lengths (30 m) must be restrained prior to the end of that watermain with a minimum of four (4) steel rods to be used on the restraints;
- All fitting which would include tees, fire hydrants, reducers and crosses up to 300 mm in size shall be restrained and as well two (2) full pipe length (12 m) on each side of the fitting and must be mechanically restrained with a minimum of two (2) steel rods to be used on the restraints;
- All branch valves shall be treated as dead end watermains and shall be restrained according to the above mentioned dead end watermain criteria; and
- NOTE: If any joint is encountered in the above restrained lengths it must also be restrained.

5.5.5 Watermain Construction

All watermain and appurtenances are to be installed, bedded and backfilled in accordance with current Ontario Provincial Standard Specifications, Safe Drinking Water Act, Drinking Water Works Permit, The Municipal Drinking Water License, and the most current recent version of ANSI/AWWA C651, the MECP “Watermain Disinfection Procedure”, and to the satisfaction of the GB. Minimum 1.8 metre depth of cover over all mains and services. Main valves and hydrant sets shall, generally, be located at a maximum spacing of 200 metres and 150 metres, respectively. Hydrant spacing for commercial areas may require reduced spacing. At main intersections, a main valve shall be provided at each direction from the intersection.

5.5.6 Flushing, Testing and Disinfection

All watermain shall be tested, flushed, swabbed and disinfected. Such procedures shall be in accordance with OPSS 441 for pressure testing and the most recent version of AWWA C651 and the MECP "Watermain Disinfection Procedure" for disinfection and connection to the waterworks system. The developer shall inform the GB when the watermain is to be tested and disinfected. Bacteriological testing will be completed by the municipal operating authority. The developer will be billed for any testing or retesting required. Any failure of the testing and disinfecting shall require the developer to reflush, retest and/or redisinfect the watermain until the watermain has met the requirements of the Ontario Provincial Standard Specifications and the MECP, to the satisfaction of the GB. Minimum requirements for bacteriological testing are:

- Escherichia coli – not detectable; and
- Total coliforms – not detectable.

All chemicals and materials used in the disinfecting of the drinking water system shall conform to the following standards:

- AWWA B300 for Hypochlorites;
- AWWA B301 for Liquid Chlorine;
- NSF/ANSI 60, Drinking Water Treatment Chemicals – Health Effects; and
- NSF/ANSI 61, Drinking Water System Components – Health Effects.

5.5.7 Completion and Acceptance

The complete water distribution system installation must be approved by the GB prior to the issuance of building permits for the subdivision.

5.6 Utilities and Street Lighting

5.6.1 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.

5.6.2 Telecommunication Companies

There are a number of telecommunication companies that may have interest in providing installations. The developer shall insure that all have the opportunity to be installed and provide service. The developer shall provide to the GB documentation, satisfactory to the GB that all such companies have been contacted and offered the opportunity for installation.

5.6.3 Electrical

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

5.6.4 Gas Servicing

Developers shall insure 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.

5.6.5 Street Lighting

Street Lighting shall be as per the standards provided by the GB.

5.7 Lot Grading

As part of a submission with the servicing drawings, an overall lot grading plan shall be provided to the GB. Existing ground elevation contours shall be shown 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.

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.

5.7.1 Lot Grading Plans

All Lot Grading Plans for new development in the GB 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 or spot elevations at maximum 0.5 m intervals, including elevations for adjacent properties;
- 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; and
- All proposed easements required for registration.

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 GB 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.

5.7.2 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 6.0 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; and
- The minimum driveway grade shall be 1.0 percent and the maximum grade permissible shall be 8.0 percent.

5.7.3 Individual Lot Grading Plan – Residential Developments

Where a development involves residential lots individual lot grading plans for each lot shall be prepared and shall be submitted to the GB's Building Department prior to application for a building permit. 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 wells;
- Location of engineered fill (where required);
- Lot grading certificate by developer's engineer in accordance with the subdivision agreement requirements; and
- In the case where the lot falls within the Conservation Authority's regulatory limit, the Conservation Authority shall be consulted in regard to any additional information provided on the plan.

5.7.4 Certification

Prior to the release of any lot from the subdivision agreement, the developer's engineer shall provide certification to the GB that the grading and drainage of the lot is in accordance with the approved lot grading and drainage plans.

5.8 Parkland and Landscaping

5.8.1 Parkland

Where park areas are dedicated to the GB 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. Consideration should also been given to accessibility when locating, grading and landscaping parklands.

5.8.2 Landscaping

Boulevards shall be finished with a minimum of 150 mm of topsail and shall be sodded or seeded.

When requested by the GB, 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 a minimum 60-70 mm dia. measured 300 mm above the ground and shall be No. 1 nursery stock. The GB 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, water, 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; and
- 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 GB) prior to "Final Acceptance" shall be replaced by the developer.

5.8.3 Walkways

Walkways shown on the site plan or 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.

5.9 Traffic and Street Signs

The developer shall be responsible for erecting all traffic street name signs within the development. These signs may be provided by the GB 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.

5.10 Asset Management

Final construction drawings and as-builts should include all structures labelled with asset numbers. The asset numbering system should be obtained from the GB prior to preparing the drawings.

Prior to Final Acceptance of the services as defined in the Subdivision or development agreement, the developer shall engage his engineer to provide to the GB a detailed list of the cost of all of the assets for the purpose of the GB's asset management system, in the requested format.

6.0 Approval Agencies

There are a number of different approval agencies that may be involved in the review of a development going through the site plan review process. Figure 6.1 shows the watershed boundaries of the four Conservation Authorities having jurisdiction in Huron County. Below is a list of approval agencies having jurisdiction in Huron County and their associated contact information:

Ausable Bayfield Conservation Authority (ABCA)
71108 Morrison Line, R. R. # 3
Exeter, Ontario, N0M 1S5
Voice: 519-235-2610 info@abca.ca

Maitland Valley Conservation Authority (MVCA)
1093 Marietta Street, Box 127
Wroxeter, ON N0G 2X0
519-335-3557 maitland@mvca.on.ca

Upper Thames River Conservation Authority (UTRCA)
1424 Clarke Road,
London, Ontario, Canada N5V 5B9
519-451-2800 infoline@thamesriver.on.ca

Saugeen Valley Conservation Authority (SVCA)
1078 Bruce Rd. #12, Box 150,
Formosa, Ontario. N0G 1W0
519-367-3040 publicinfo@svca.on.ca

Source Water Protection

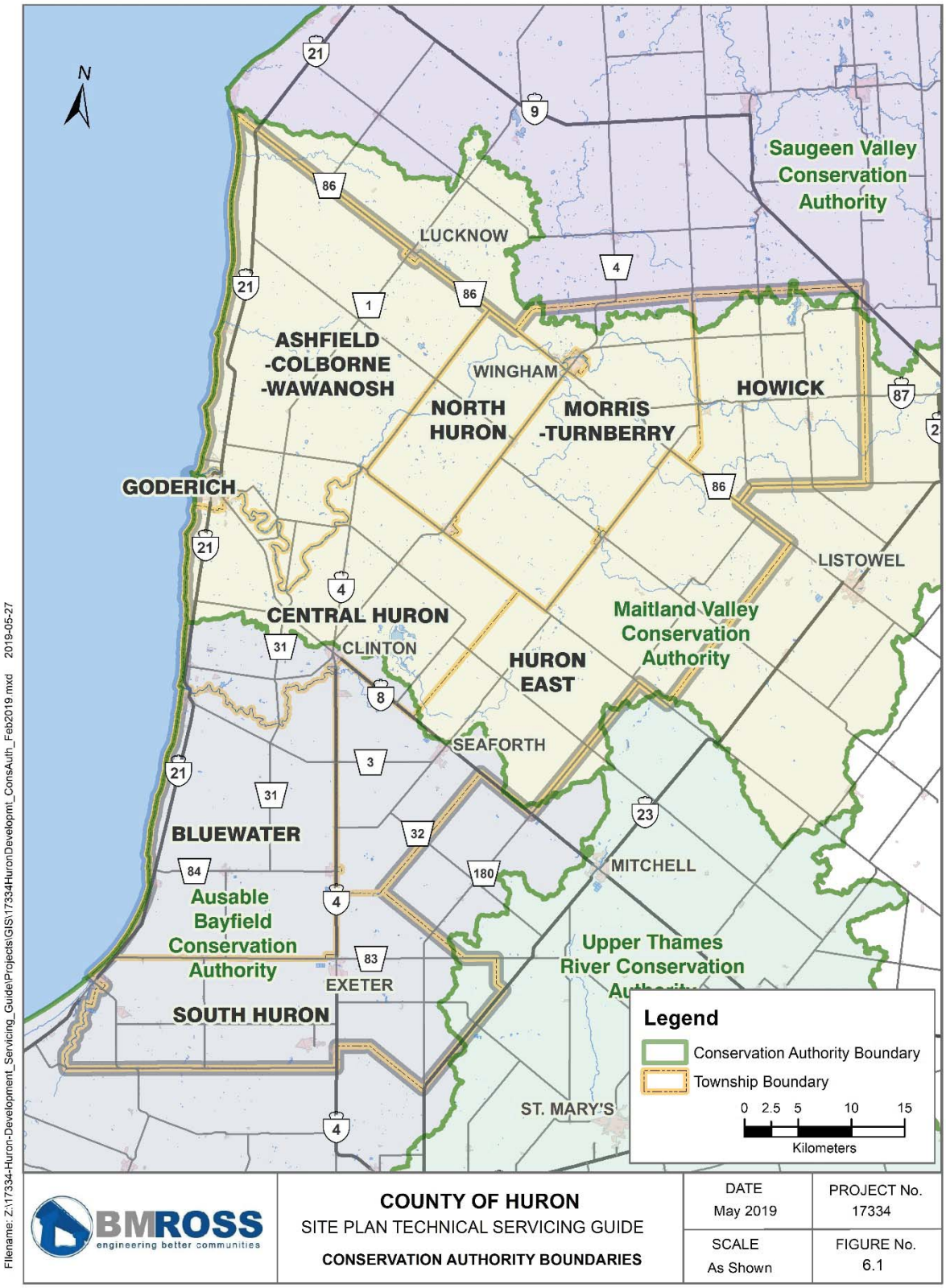
Ausable Bayfield Maitland Valley Source Protection Region
1-888-286-2610 mmacdonald@abca.ca or dclarkson@abca.ca

Saugeen, Grey Sauble, Northern Bruce Peninsula, Source Protection Region
c/o Grey Sauble Conservation Authority
RR 4, 237897 Inglis Falls Road, Owen Sound, ON N4K 5N6
mail@waterprotection.ca

Thames-Sydenham and Region Drinking Water Source Protection
519-451-2800

Ministry of Environment, Conservation and Parks (MECP)
Environmental Approvals Access and Service Integration Branch
135 St. Clair Ave. West, 1st Floor, Toronto, ON M4V 1P5
1-800-461-6290

Figure 6.1: Boundaries of local Conservation Authorities within Huron County



Huron County Health Unit (HCHU)
Clinton Office
77722B London Road, RR 5
Clinton, Ontario N0M 1L0
519.482.3416
hchu@huroncounty.ca

Wingham Office
131 John Street East
Wingham, Ontario N0G 2W0
519.357.4993
hchu@huroncounty.ca

Huron County Planning & Development Department
57 Napier Street, 2nd Floor
Goderich, Ontario N7A 1W2
Hours: Monday - Friday 8:30 AM - 4:30 PM
Telephone: 519-524-8394, ext 3
Toll-Free: 1-888-524-8394, ext 3
Fax: 519-524-5677
Email: planning@huroncounty.ca

Huron County Public Works
Huron County Court House
1 Courthouse Square
Goderich, ON N7A 1M2
Hours: Monday - Friday 8:30 a.m. - 4:30 p.m.
Telephone: 519-524-8394 ext. 3504
Fax: 519-524-9291
Email: publicworks@huroncounty.ca

Huron County Economic Development
54 West Street
Goderich, ON N7A 2K3
Hours: Monday - Friday 8:30 a.m. - 4:30 p.m.
Telephone: 519-524-8394 ext. 6
Email: tourism@huroncounty.ca

Ministry of Transportation (MTO)
London Regional Office, 659 Exeter Road
London, ON N6E 1L3
(519) 873-4100

Ministry of Natural Resources and Forestry (MNRF)
Ministry of Natural Resources and Forestry, Guelph District
1 Stone Road West
Guelph ON, N1G 4Y2
1-866-686-6072 mnr.nric.mnr@ontario.

APPENDIX A
Technical Studies and Estimates of Potential Costs

The location, nature and complexity of a proposed development will determine what technical studies will be required as part of the site plan process. The intent of the list below is to provide developers with an understanding of the types of studies that have been required in Huron County in the past. It should not be assumed that every development will require every type of study. Descriptions of the studies are provided in Section 3 of the Guide. It should also be noted that these studies must be completed by the appropriate professionals.

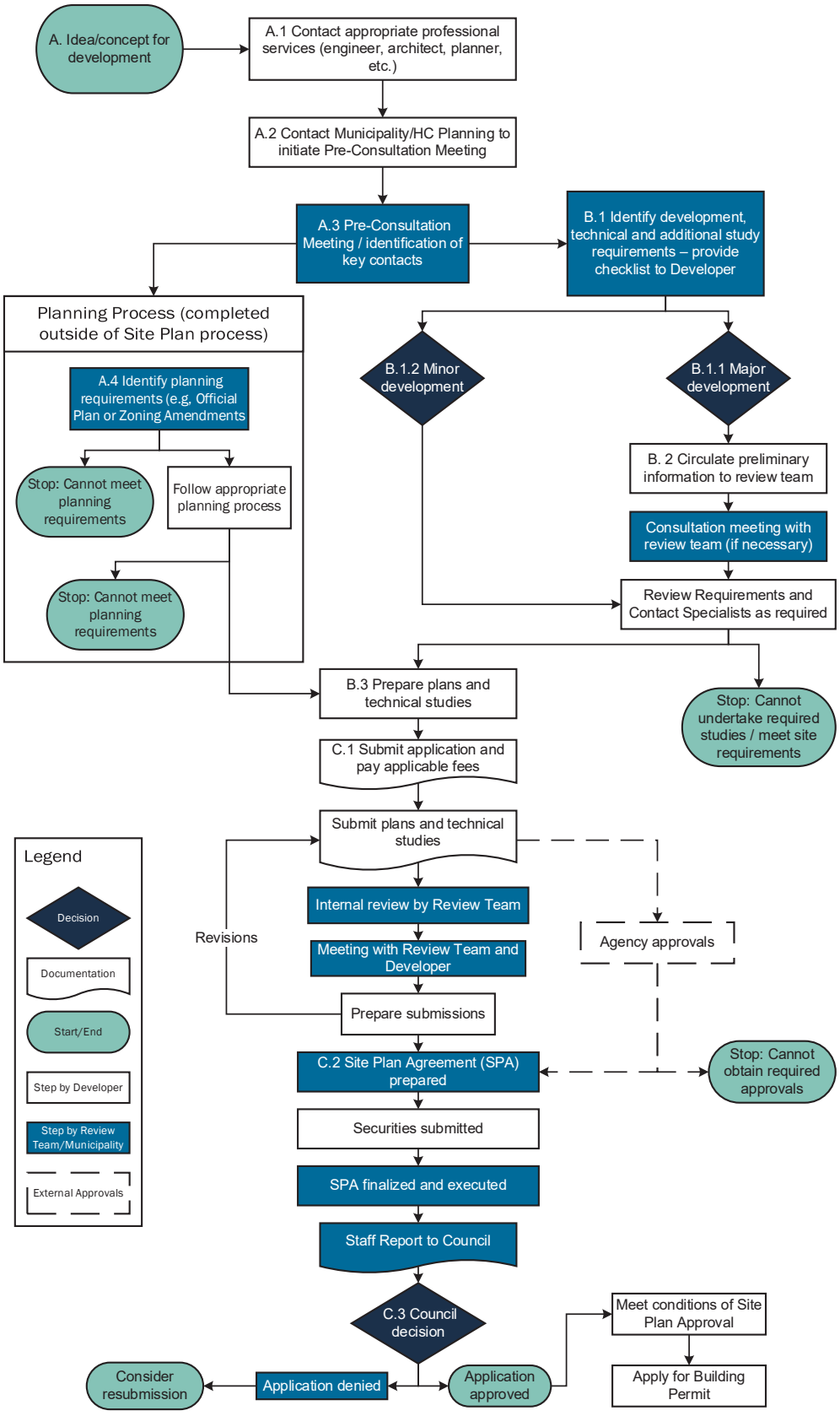
For the studies, a range of costs is presented. The ranges are generally representative of studies for major developments but may be much higher for more complex or larger applications. Costs may be lower for minor developments. These costs are estimates for information purposes only, however, each site is unique, and special circumstances may exist which will result in a higher (or lower) cost for one or more of the required studies.

Study	**Requirement or Potential Trigger(s)**	**Potential Cost Range**
Stormwater Management Report	☐ Requirement for all development/ redevelopment except minor may not require a full stormwater management report	$5,000 - $20,000
Sediment and Erosion Control Plan	☐ Requirement for all development/ redevelopment	$2,000 - $5,000
Lot Grading and Drainage	☐ Requirement for all development/ redevelopment	$5,000 - $15,000
Planning Rationale or Justification Report	☐ Where development or redevelopment requires Official Plan or Zoning By-law amendment	$5,000 - $15,000
Servicing Brief or Functional Servicing Report	☐ Requirement for all development/redevelopment	$5,000 - $20,000
Geotechnical Assessment or Slope Stability Study	☐ Development/redevelopment proposed near slopes or floodplains ☐ Property has high water table, unstable soils	$5,000 - $20,000
Archaeological Assessment	☐ Development in areas of known or high archaeological potential (e.g. near water features, early settlement areas, cemeteries, other archaeological sites)	$6,000 - $100,000+
Traffic Impact Assessment	☐ Development may impact traffic existing movements ☐ Development will generate traffic	$2,000 - $20,000
Environmental Impact Study	☐ Proposed development located within or adjacent to a significant natural heritage feature (woodland, wetland, Area of Natural or Scientific Interest, Species at Risk habitat)	$5,000 - $75,000

Environmental Site Assessment (may require Record of Site Condition)	☐ Redevelopment of a brownfield (previously developed) site.	$5,000 - $25,000
Hydrology/Floodplain Analysis	☐ Development located within floodplain	$5,000 - $25,000
Landscaping Plan/Design	☐ Required for all development/redevelopments	$2,000 - $15,000
Tree Saving/Preservation Plan	☐ Site is forested or partly treed	$2,000 - $10,000
Hydrogeological Study	☐ Development type may impact groundwater flows ☐ Development requires a well	$5,000 - $35,000
Cultural Heritage Evaluation or Heritage Impact Assessment	☐ If development will impact building or structure greater than 40 years old ☐ Redevelopment of heritage building ☐ Development within municipally designated Heritage Area	$2,000 - $10,000
Noise Study	☐ Development may generate noise and impact sensitive adjacent uses (residences) ☐ Development may be impacted by adjacent noise-generating land uses	$5,000 - $10,000
Lighting and Photometric Design Study	☐ Development may have lighting impacts on adjacent properties	$2,000 - $10,000
Vibration Study	☐ If pile driving is required	
Structural Engineering Report	☐ Redevelopment of an existing building for a new use or range of uses	
Air Quality	☐ If development or construction may result in impacts to air quality (including dust)	

APPENDIX B
Developer Workbook

Site Plan Process



The intent of this Appendix is to serve as a quick reference to the full set of developer checklists included throughout the body of the Guide.

Developer Responsibilities:

Developer responsibilities include:

	Date	Comments
☐ Reviewing potential property use restrictions or requirements relating to Source Water Protection;		
☐ Obtaining property and conceptualizing a plan for development;		
☐ Hiring the required professionals to assist in producing a site plan. At a minimum, a professional architect, engineer, land surveyor or qualified designer is required to prepare the site plan drawings. Other professionals may be required for components of the site plan (e.g., landscape design, stormwater management, traffic impacts);		
☐ Initial contact with the Municipality to start the site plan review process;		
☐ Initial contact with the planner at the Municipality to identify the necessary planning processes (i.e., Official Plan or Zoning By-law amendments), if required;		
☐ Submitting preliminary site plan drawings and technical studies (if required) to the review team;		
☐ Reviewing need for other studies (e.g. archaeology, environmental impact study);		
☐ Attending a pre-consultation meeting, and if necessary, additional meetings with the review team;		
☐ Responding to and incorporating feedback from the review team into a revised site plan;		
☐ Preparing revised site plans for submission to the review team to address deficiencies;		
☐ Complete and submit a Site Plan Application form;		
☐ Paying the Site Plan Application fee and any fees associated with review of the site plan;		
☐ Applying and paying permit fees for agency approvals, if required;		

	Date	Comments
☐ Submitting final site plan drawings;		
☐ Reviewing and signing the Site Plan Agreement;		
☐ Submitting securities;		
☐ Meeting the conditions of the Site Plan Agreement; and		
☐ Paying costs associated with extending of services to the property (if necessary).		

Development Concept

Developer checklist:

	Date	Comments
☐ Review zoning and Official Plan designations and policies;		
☐ Review Source Water Protection policies and mapping;		
☐ Review the municipal site plan control by-law to determine if a site plan application is required for the type of proposed development;		
☐ Review the municipality's development and servicing guidelines (if available);		
☐ Confirm property limits and the extent of existing services (e.g., sewage, water, hydro, utilities);		
☐ Consider what technical studies may be required (see Section 3) and costs;		
☐ Consider what other studies (e.g. archaeology) may be required and costs;		
☐ Retain professionals to complete technical and other studies that may be required;		
☐ Meet with professional engineer/architect/surveyor to discuss the preparation of a preliminary site plan for the proposed development concept; and		
☐ Initiate discussion with local utility providers (telecommunications, hydro, gas, etc.,).		

Pre-Consultation

Developer checklist:

	Date	Comments
☐ Contact the Municipality to request a pre-consultation meeting;		
☐ Provide information, preliminary information and materials to the Planning Coordinator/Planner (at minimum, 1 week ahead of the scheduled meeting date);		
☐ Contact retained professionals and ask them to attend the meeting; and		
☐ Fill out pre-consultation request form and pay associated fees – if applicable.		

Other Development Processes (outside of the Site Plan Process)

Developer responsibility:

	Date	Comments
☐ To provide copies of approvals and/or permits from other approval agencies obtained during the site plan process to the Municipality.		

Considerations for Major Developments

For major developments, developers should expect:

	Date	Comments
☐ Additional study requirements and the potential need to hire specialists and/or professionals;		
☐ Detailed comments or questions from the review team;		
☐ A potential need to obtain permits from approval agencies;		
☐ Multiple revisions to the site plan may be required before being approved; and		
☐ Additional time and costs associated with the review.		

Preparation of Plans and Technical Studies

All site plan drawings submitted by developers are required to have:

	Date	Comments
☐ Address and name of development;		
☐ Metric scale (not greater than 1:500);		
☐ North arrow;		
☐ Appropriately scaled font size and line work;		
☐ Topographic contours or spot elevations for adjacent properties;		
☐ Name, address, telephone and email address of author;		
☐ Geodetic benchmark;		
☐ Property limits (including bearings and dimensions);		
☐ Existing and proposed structures, driveways, storage and parking areas with dimensions;		
☐ Roads (include names), lanes, easements, road widenings, reserves and right-of-ways;		
☐ Author's professional stamp;		
☐ A standard title block in the lower right corner, including information such as revision dates;		

	Date	Comments
☐ Existing infrastructure and structures shown in greyscale as dotted or dashed lines; and		
☐ Proposed servicing infrastructure (including septic systems) and buildings shown in a solid, darker colour (to stand out from existing).		

General layout drawings submitted by developers are required to have:

	Date	Comments
☐ A table of site statistics showing compliance with zoning requirements (e.g. lot area, percent lot coverage – proposed and permitted, lot frontage, gross floor area permitted and proposed, paved area, landscape area proposed and permitted, and parking spaces proposed and required);		
☐ All yard and setback requirements;		
☐ Driveways, parking stalls (including barrier-free) and aisles, and dimensions;		
☐ A key plan;		
☐ Above ground utilities, existing and proposed (poles, meters, lighting, signs, transformers, utility pedestals, hydrants);		
☐ Turning radii;		
☐ Exterior surface treatments;		
☐ Loading areas and dimensions;		
☐ Garbage and recycling enclosures;		
☐ Existing and proposed signage;		
☐ Fire routes (where required);		
☐ Building entrances;		
☐ Finished floor elevation;		
☐ Pedestrian paths on the site and any connections to off-site paths;		
☐ Any active transportation features (e.g. bicycle racks, etc.);		
☐ Snow storage areas;		
☐ Any Source Water Protection areas (e.g. Highly Vulnerable Areas, Well Head Protection Area, etc.);		

	Date	Comments
☐ Flood lines, as specified by the local Conservation Authority;		
☐ Mail delivery or post box location;		
☐ Location of rooftop equipment and screening features;		
☐ Location, height and type of proposed fencing and retaining walls;		
☐ Any outdoor storage areas; and		
☐ Generator set location.		

Servicing Plan Drawings submitted by developers are required to have:

	Date	Comments
☐Geodetic and site benchmarks;		
☐ All existing underground services (including utilities, septic systems) on streets and easements within the property limits and adjacent streets/easements;		
☐ Topographic contours and spot elevations;		
☐ Road allowances, lot and block frontages, easements and reserves;		
☐ Curb, gutter and sidewalk, with dimensions;		
☐ Road widths, cross-sections, ditches, ditch gradients, and curb gradients;		
☐ For stormwater and sanitary sewers – location, size, connection details, direction of flow, and invert elevations		
☐ For watermains – connections, hydrants, valves and diameters;		
☐ Length, grade, pipe material and class, usage and bedding type for all pipes;		
☐ Stormwater management devices;		
☐ Catchbasins and manholes, including top and invert elevations;		
☐ Ditches, swales and culvert details (including direction of flow);		
☐ Existing and proposed fencing (height and type), hedges, trees		
☐ Basement floor elevations;		
☐ Existing and proposed elevations;		
☐ Adjacent off-site servicing;		

	Date	Comments
☐ Roof water leader discharge points; and		
☐ Erosion and sediment controls.		

Site Grading Plans submitted by developers are required to have:

	Date	Comments
☐Geodetic and site benchmarks;		
☐ 1:500 scale;		
☐ Existing and proposed lot numbers and blocks;		
☐ All proposed rear lot catch basins, leads, top elevations and inverts;		
☐ Location of service conditions;		
☐ Pipe sizes, slope and directions of flow;		
☐ Location of any easements for registration;		
☐ Topographic contours (with a maximum of 0.5 m contours) and spot elevations;		
☐ Centre line of road grades along streets adjacent to he property and existing grades;		
☐ Legend for existing and proposed grades;		
☐ Proposed and existing elevation and key locations around the site (e.g. lot corners) and buildings;		
☐ Drainage arrows and percentage of cross fall to catchbasins;		
☐ Building elevations (e.g. basement floors, finished first floor);		
☐ Erosion and sediment controls;		
☐ Sidewalks and walkways, including base and surface materials;		
☐ Manholes, catchbasins, hydrants and valves;		
☐ Spot elevations for catchbasins, sub-drains, entrances;		
☐ Retaining wall, including top and bottom elevations and engineering details; and		
☐ Elevation of driveways, parking areas and other paved areas.		

Building Elevation Drawings submitted by developers are required to have:

	Date	Comments
☐ Architectural elevations of each façade, with orientation labelled;		
☐ Building materials and colours;		
☐ Screening for mechanical units;		
☐ Building dimensions;		
☐ Facade signage;		
☐ Location of windows, doors, loading docks; and		
☐ Details for garbage enclosures.		

Landscape Plans submitted by developers are required to have:

	Date	Comments
☐ Adjacent lands and roads marked with spot elevations;		
☐ Walkways, parking areas, signage, street furniture, and above ground services;		
☐ Natural features, specifically features/trees to be preserved or removed;		
☐ Planting details for trees and shrubs; and		
☐ Location of any landscape features (e.g. paths, fences, planters, retaining walls, etc.).		

Site Plan Submission Requirements:

A Site Plan Submission must include:

	Date	Comments
☐ A completed and signed site plan application form (available from the municipality);		
☐ The required number of site plan drawing sets (both in digital and hard copy);		
☐ The required number of copies of any associated studies;		
☐ Review fee; and		
☐ Copies of approval documents from other approval agencies (e.g., Conservation Authorities, Ministry of Transportation, local Heritage Committee).		

Site Plan Agreement

The developer must:

	Date	Comments
☐ Review the Site Plan Agreement;		
☐ Provide comments, if any, on the Agreement;		
☐ Submit required securities;		
☐ Sign the Site Plan Agreement;		

APPENDIX C
Reference Websites

The following websites provide mapping, planning, source water protection and other reference information.

Huron County Mapping Portal:
https://gis.huroncounty.ca/Html5Viewer/?viewer=Public

Ausable Bayfield Conservation Mapping:
https://maps2.camaps.ca/GVH/index.html?viewer=ABCA_Public.ABCA_View

Make a Map: Natural Heritage Areas:
https://www.ontario.ca/page/make-natural-heritage-area-map

Source Water Protection Mapping:
http://www.applications.ene.gov.on.ca/swp/en/index.php