

APPENDIX I
to the
OFFICIAL PLAN
of the
CITY OF BRANTFORD

CITIZEN INVOLVEMENT

Throughout the generation of and the process leading to the adoption of the Official Plan of the City of Brantford efforts have been made to maintain public involvement and to afford individuals the opportunity to provide input into the Official Plan document and to respond to proposals made therewith, all with a view of ensuring that City Council would have full information provided to it prior to its review and adopting the Official Plan.

In order to create a manageable working environment for the creation of the Official Plan, City Council elected to delegate its responsibility to a Sub-Committee of Council Members known as the Official Plan Steering Committee. This delegation, was by By-law Number 102-86 under the provisions of the Municipal Act and allowed a smaller representative group of City Council to develop the details of the Plan and undertake the necessary public involvement in an atmosphere more conducive to encouraging public responses. In 1985 this Official Plan Steering Committee of Council oversaw the gathering of information and opinion which form the basis for the Planning Appraisal Study. Much of this Study consisted of making contact with representative groups and individuals in the Municipality and soliciting information and opinion from them in order to set a planning context as a basis for the Official Plan.

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The next major stage of public involvement came in May of 1986 when City Council announced that its Steering Committee would be convening public hearings on June 24th and June 25th, 1986 for the purposes of gaining public response and input to a draft Official Plan.

In order to maximize public knowledge of the draft Official Plan and allow people to make informed comment the entire draft Official Plan, including Schedules, was published in a local weekly newspaper of general circulation in the Municipality together with an explanation of the process and an invitation to attend a public Open House which was held on May 21st, 1986 at City Hall where Staff and Consultants were available to discuss the contents of the proposed document. A number of individuals took advantage of this informal opportunity to gain insight into the document and to offer opinions or comments to Staff prior to the hearings of the Steering Committee.

In compliance with the provisions of Section 17(2) of the Planning Act, S.O 1983, formal public meetings in the form of hearings to receive input and provide information were held on behalf of City Council by the Official Plan Steering Committee under its delegated authority on June 24th, and June 25th, 1986. In addition to the notice of these meetings given with the publication of the draft Official Plan, notices were also published in the Brantford Expositor, a local daily newspaper with a general circulation in the Municipality and surrounding area on May 8th, 15th and 22nd, 1986. There were no written requests for the giving of individual notice of these public meetings.

During the course of the hearings the Official Plan Steering Committee of City Council received some 75 written and/or verbal presentations regarding a wide range of matters contained in the draft Official Plan as published by the Municipality in May of 1986. All persons wishing to appear in person before the Committee to speak to their submissions were afforded opportunity to do so during these meetings. Details of the submissions made, together with Minutes of these meetings (June 24th and 25th, 1986) are documented in the Report of the Official Plan Steering Committee to City Council dated October 1986.

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Following receipt of all submissions the Official Plan Steering Committee began a systematic review of such submissions. The review was carried out in August of 1986, in meetings which were open to the public and for which notice was given by letter to all persons making submissions to the Committee, and by publication in the local daily newspaper. The Committee upon completion of the review formulated recommendations to City Council for its consideration in respect to each of the submissions received.

In order to ensure that all persons with an interest in the Official Plan were made aware of the Committee's recommendations, individual letters were sent to all persons making submissions to the Committee outlining the specific recommendation being made by the Committee to Council in respect of their specific submission. In addition a large two-page advertisement was placed in the Brantford Expositor on September 18, 1986 outlining each of the recommendations being made to Council, together with a map identifying the location of specific lands which would be affected by certain of the recommendations. Invitations were included with these letters and advertisement to persons wishing to make further representations on the matter directly to City Council in conjunction with the Committee's recommendations regarding the draft Official Plan. This procedure is documented in detail in the aforementioned Committee's Report to City Council together with the Minutes of all Steering Committee meetings.

In October of 1986 Council received the Committee's recommendations and held open Council meetings to receive further input from the general public and to debate the provisions of the proposed document and the recommendations of the Steering Committee. Over the course of two meetings, held October 15th, and October 22nd, 1986, City Council received a further 15 written and verbal submissions regarding a range of topics pertaining to the recommended Official Plan document. Each of the matters were considered individually within the context of the recommended document and, during open Council session, conclusions were reached by Council on the submissions and the recommendations made by the Steering Committee in respect of the Official Plan document.

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SUPPORT DOCUMENTS

The following list refers to the main source documents utilized in the generation of the Official Plan and to its adoption. Due to the size and format of these documents they are not included in this Appendix but are only referenced. Copies of the actual documents may be viewed in the office of the City Clerk.

The source documents are as follows:

1. City of Brantford Planning Appraisal Study
September 1985;
Prepared by: Walker, Wright, Young, and Associates Limited, and C. N. Watson and Associates Limited.
2. Report of the Official Plan Steering Committee to City Council
October 1986 (Book 1).
3. Addendum to Book 1.
Item 4 of the Report of the Official Plan Steering Committee.
4. Report of the Official Plan Steering Committee to City Council
October 1986 (Book 2).
5. Report prepared by Planning Staff
in consultation with Walker, Wright, Young, and Associates Limited on
submissions received by City Council to the Draft Official Plan on October
15th, 1986 (Book 3).
6. Submissions received prior to Council adopting
the Official Plan and Minutes of Council meetings of October 15th, 22nd,
and November 3rd, 1986 (Book 4).

While these are the main source documents related to the Official Plan, there are contained within them references to numerous other documents which formed directly and indirectly considerations upon which the Official Plan is based. Reference should be had to those documents, however, they are not contained in this Appendix.

**APPENDIX III
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IMPACT ASSESSMENT GUIDELINES

The Official Plan requires that Impact Assessments (IA's) be prepared when development is proposed within Environmental Control Policy Areas or in adjacent lands to Environmental Protection Policy Areas and Environmental Control Policy Areas. The general extent of adjacent lands is described in the Official Plan.

The primary purposes of an IA are to:

- describe the key features and functions of the study area;
- provide a summary of the proposed development;
- determine the potential impacts of the proposed development on key features and functions;
- identify mitigation that will eliminate or reduce potential impacts identified above;
- identify net impacts after mitigation is applied; and
- identify any monitoring programs that are necessary.

The City, with input from the Grand River Conservation Authority and other appropriate agencies, will determine if the net impacts are acceptable and if development may proceed.

Although not mandatory, it is highly recommended that proponents prepare an Issues Summary Report (ISR) prior to undertaking the detailed work required for an IA. The ISR is an initial definition of constraints to development. The proponent should identify key features and functions based on existing knowledge (and any data that have been collected as part of the study) and give a general overview of the proposed development and the potential impacts on these features and functions.

The ISR can be used to define the Terms of Reference for the IA. This is advantageous to both the proponent and review agencies. The proponent knows which studies are required, which eliminates doing unnecessary work and not having review agencies requesting additional studies after the IA is submitted. For instance, the Official Plan identifies generic adjacent land distances for different features and in different areas of the City (for hydrogeological studies). An ISR may result in the adjacent lands definition being refined and focussing the study required for the IA. In extreme cases, the ISR may identify significant constraints that may preclude some areas from being developed, and the proponent may wish to reconsider the viability of the proposed development.

The Natural Heritage Reference Manual provides guidelines for preparing IAs. Proponents should review these prior to undertaking the IA. Nonetheless, the following components should be considered when conducting an IA for development within the City of Brantford.

There are three technical disciplines that may need to be addressed in an IA. There may also be social issues to be dealt with. The City will determine if the IA should address any social features, functions, or concerns. The three technical disciplines are biology, hydrology, and hydrogeology.

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These are discussed in more detail below.

Biology

It is critical to recognize that biology is not an isolated science. Vegetation communities and the wildlife species that they support are highly dependent on abiotic features such as hydrology and hydrogeology. Therefore, a good understanding of these sciences is required before impacts on biological features and functions can be predicted.

For the biological component of an IA, three main topics should be addressed: features, functions, and linkages. Features are generally vegetation communities or species that are considered especially vulnerable to habitat changes, or that are considered significant at one of five levels (globally, nationally, provincially, within Site Region 7, or within the City of Brantford). Standard references for determining significance include the database maintained by the Natural Heritage Information Centre (NHIC) and the data report prepared as part of the Official Plan Review.

In most cases, biological fieldwork will be required before key features, functions, and linkages may be determined. The ISR will help to focus on what field studies are required. Generally, it is likely that it will be necessary to map and describe vegetation communities and complete an inventory of plant and wildlife species.

Descriptions of vegetation communities should be done following the latest version of the Ecological Land Classification (ELC) system. This provides a standardized approach and also results in consistent nomenclature so that the vegetation communities can be assessed for provincial significance using the NHIC database.

Typically, at least two visits are required to complete an inventory of plant species so ensure that the full growing season is covered. These are generally in late spring and summer. Depending on the quality of the habitat and the species that it is most likely to support, it may be necessary to conduct an inventory in early spring for ephemeral species and in late summer or early autumn for late-flowering species.

At a minimum, the wildlife survey should include a breeding bird survey, typically conducted between the end of May and the first week of July. In complex habitats, more than one visit may be required. It may also be necessary to employ special techniques such as playback tapes for difficult-to-detect species such as owls and marsh birds.

Other wildlife groups should also be inventoried, and the amount of time that is devoted to this will be variable depending on the ISR and the resources present. If there is water on or adjacent to the site, it may be necessary to document amphibian breeding by checking for salamanders and listening for calling amphibians. It may be necessary to complete winter tracking surveys of mammals to determine species present or if there are significant concentrations of deer or other sensitive species.

Where fish habitat may be affected, this habitat should be adequately described using the latest Ministry of Natural Resources (MNR) protocol. Depending on the nature of the proposal and the

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amount of existing information, it may not be necessary to sample fish populations. However, there may be occasions where the existing database is inadequate to evaluate the resource. In these cases, it may be necessary to sample fish using techniques such as electrofishing. In some instances, an assessment of benthic invertebrate populations may be necessary to evaluate existing habitat quality and document baseline conditions if monitoring of impacts is likely to be required.

The results of the plant and wildlife inventories should be analyzed to determine if there are any features or habitats that would qualify as Significant Wildlife Habitat (SWH) as defined by the Natural Heritage Reference Manual or its supporting documents (the SWH Technical Guide and the SWH Decision Support System).

Biological functions are processes or activities that occur in the study area. Many of these, such as nutrient recycling, are not easily studied or evaluated, and are therefore not usually the subject of an IA. However, one of the simple biological functions of an area is to provide habitat for plant and wildlife species. By recognizing this, the proponent should deal with the impacts of the proposed development on all species and not only those that have some level of significance. There are some instances when the loss of common species or general degradation of habitat may not be an acceptable impact.

As part of the linkage function, the IA should determine if there is movement by wildlife among habitat patches that may be affected by the proposed development. This often may be done at a landscape ecology level by explaining the functions of adjacent habitat patches and the habitat requirements of the wildlife species that occur in the general area. In some cases, fieldwork may be required to determine if there is actually significant movement of wildlife among areas.

The biological component of the IA must be holistic and look at thresholds of impacts, taking all of the other components into account. The results of any hydrological and hydrogeological studies must be considered as they have high potential to affect the conclusions of the biological analysis. For instance, changes in hydrology or hydrogeology may affect plant communities and therefore the wildlife species that they are capable of supporting. Aquatic resources may be affected by altering baseflow, water temperatures, stream flows, erosion, and water quality. There may also be subtle changes in terrestrial biology that affect wildlife populations. For instance, the amount of natural area within the general area may decline below a threshold so that it is no longer suitable for some wildlife species, or individual habitat patches may become too small so that some species are lost through indirect effects. Other indirect effects may include habitat fragmentation, disturbance, and increased predation and parasitism.

The biological component should also recommend mitigation required to minimize impacts. It will be necessary to include those measures identified in studies from other disciplines. For instance, erosion and sediment control plans that may be part of a hydrological report need to be assessed to ensure that they are adequate to protect biological features and functions.

Finally, it may be necessary to undertake some monitoring, and the IA should identify the need for this. Monitoring should be practical and designed to measure an expected impact. Monitoring is often two-fold: to determine if mitigation was actually undertaken as specified, and to see if the mitigation worked as anticipated.

Hydrology

Hydrological studies will likely be required in all cases to determine runoff from development and the need for stormwater management. In addition to determining water flows, erosion and sediment controls should be described. Stormwater management should also reflect the potential need for infiltration to the water table. A key component in many areas will be water quality, particularly in the Northwest and Southwest where there are significant fisheries resources, wetlands, and terrestrial resources. In these areas, it will be necessary to determine potential impacts on stream baseflow, peak flows, stream bank erosion, water temperature, and water quality. In areas of highly pervious soils, potential impacts on the quality and quantity of water being delivered to the water table should be described.

Monitoring requirements should be described. Depending on the nature of the development and adjacent natural areas, this may include water quality and quantity measurements, monitoring efficiency of stormwater management facilities, and stream erosion and sedimentation patterns.

Hydrogeology

Hydrogeological studies will be required in the Northwest, and in portions of the Northeast, and possibly in other areas where there are pervious soils. The need for hydrogeological studies will be determined by the City and the Grand River Conservation Authority in conjunction with other appropriate agencies.

Where hydrogeological studies are necessary, the study will determine impacts of the development on groundwater quality and quantity. Key factors to consider are the amount of impervious surfaces that will result from development and how this will affect infiltration rates, if there will be a change in groundwater quality as a result of surface runoff and infiltration, and what impacts there may be to receiving water bodies or any seeps or groundwater discharge sites.

No strict guidelines are presented above for preparation of an IA, because each IA should be unique to reflect the natural conditions present and the impacts that development is likely to have on the resources. The complexity of an IA should be a direct reflection of the complexity of the natural environment and the intensity of development. The level of effort required for an IA will vary from a brief letter report to intensive studies detailing biological, hydrological, and hydrogeological resources and impacts of the proposed development on them.

**APPENDIX IV-A
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CATEGORY 1 ABANDONED LANDFILL SITES

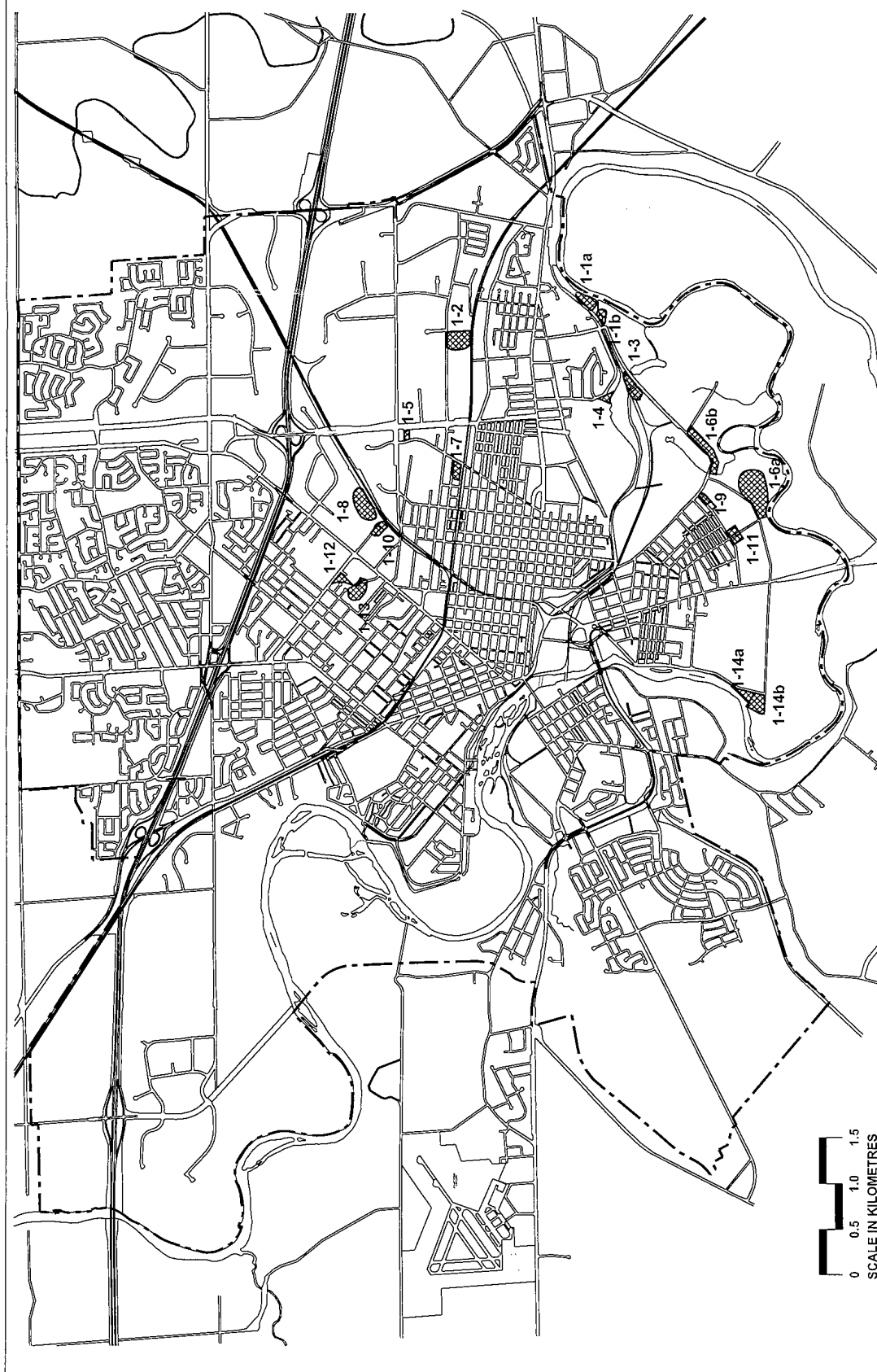
These sites either contain inert materials such as building demolition rubble or street sweepings or they are not adversely impacting human health or the environment on adjacent lands.

Geotechnical investigations including chemical analyses of soil and groundwater samples should be required on Category I sites prior to any change in land usage on the sites. The chemical analytical results should be compared against Table B in the Ministry of Environment A Guideline for Use at Contaminated Sites in Ontario. Slope stability may be an issue on some sites where steep slopes have been formed by the deposition of waste materials.

These investigations are not required on lands adjacent to Category I sites.

Category 1 abandoned landfill sites include sites: 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 1-12, and 1-13.

Figure A-1 shows the location of the Category 1 abandoned landfill sites.



City Boundary

LEGEND

Abandoned Landfill Sites

Landfill Site
Reference Number

1

FILE NAME: 99255-08

City of Brantford, Ontario

Figure A-1: Category 1 Abandoned Landfill Sites

investigated by Gore & Storrie and Golder Associates 1990

**APPENDIX IV-B
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CATEGORY 2 ABANDONED LANDFILL SITES

Category 2 landfill sites contain waste materials that can leach and become mobile with surface water or groundwater. Geotechnical investigations including chemical analyses of soil and groundwater samples should be required on Category 2 sites prior to any change in land usage on the sites. The chemical analytical results should be compared against Table B in the Ministry of Environment A Guideline for Use at Contaminated Sites in Ontario.

The four Category 2 sites are Sites 2-1, 2-2, 2-3 and 2-4.

Investigations for impact to groundwater should be conducted down gradient of Category 2 sites.

The radius of lands to be investigated was calculated by multiplying the estimated groundwater flow velocity by the number of years since the landfill was closed. ($R = \text{velocity} \times \text{years}$). The groundwater flow velocity was estimated to be about 3 metres per year assuming a hydraulic conductivity of 1×10^{-4} m/sec and a hydraulic gradient of 0.001 m/m.

Site 2-1 was closed about 50 years ago and groundwater may have moved about 150 metres in the down gradient direction.

Sites 2-2, 2-3 and 2-4 were active until about 70 years ago and groundwater may have moved about 210 metres in the down gradient direction from these sites.

The radii of investigation are shown on Figures B-1, B-2, B-3, and B-4.

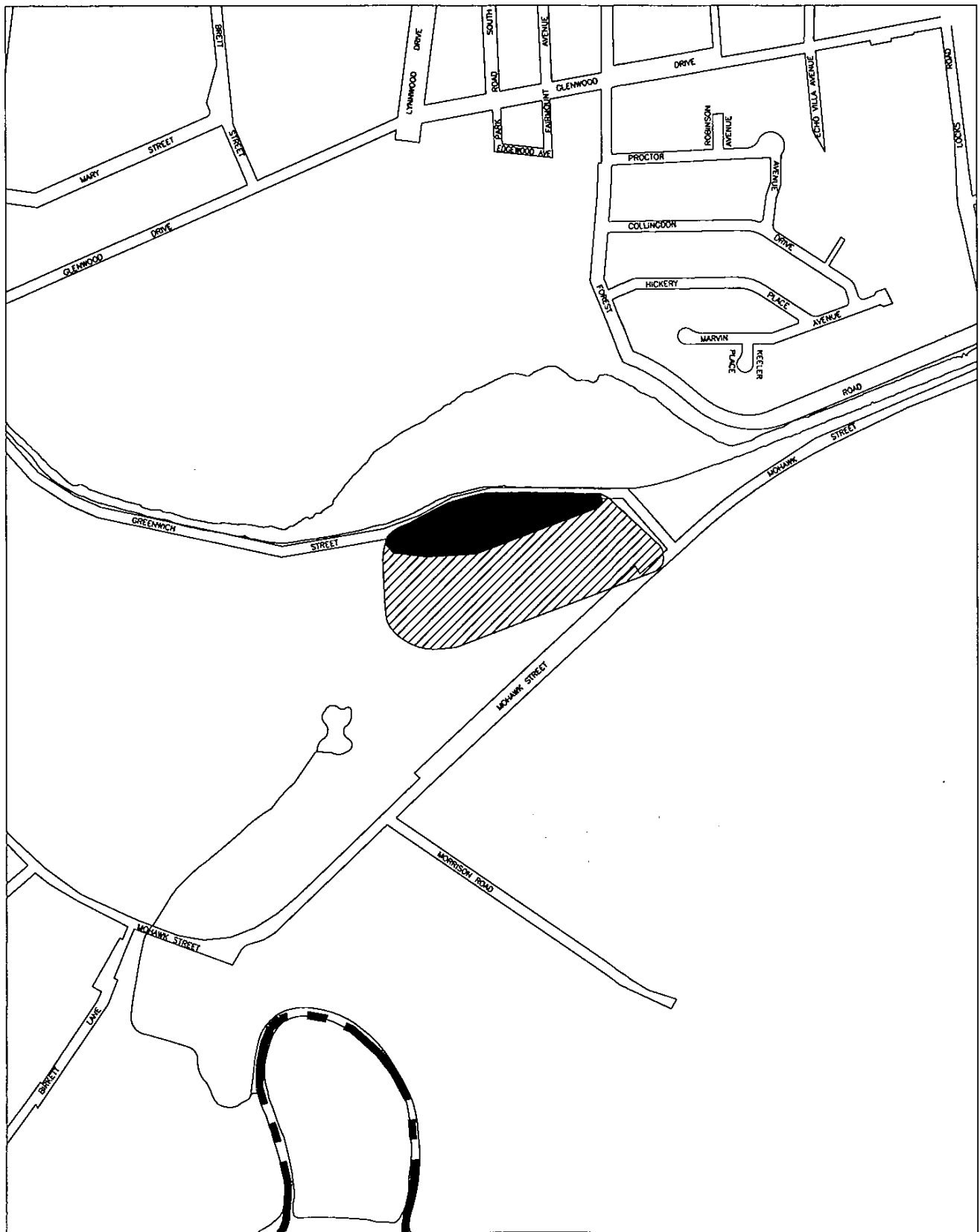


Figure B-1

Abandoned Landfill Site 2-1
Required Investigation Zone
for Groundwater Assessment



0 metres 100 200 300

Legend



Estimated Extent of Fill



Area Requiring Investigation

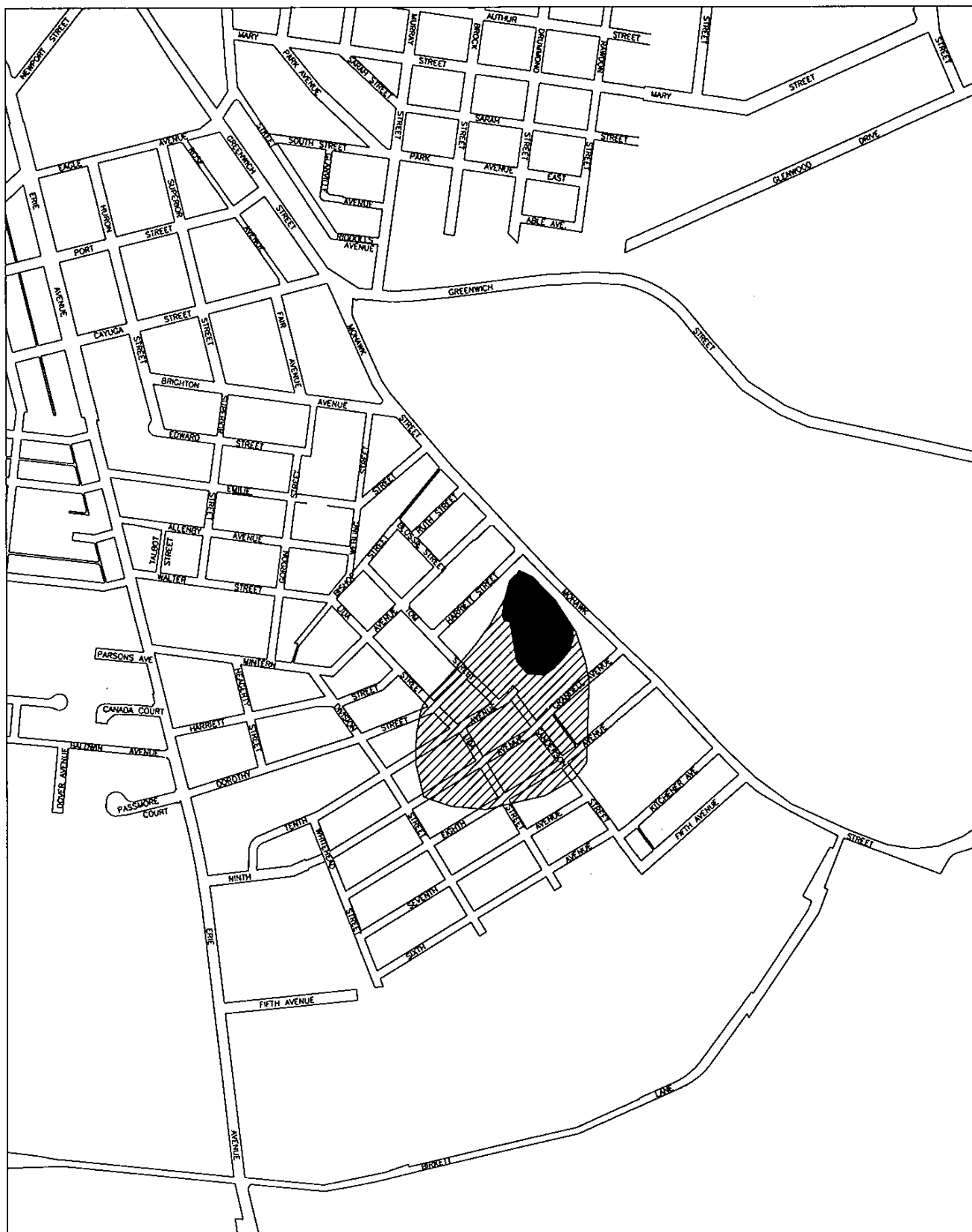


Figure B-2

Abandoned Landfill Site 2-2
Required Investigation Zone
for Groundwater Assessment



0 metres 100 200 300

Legend



Estimated Extent of Fill



Area Requiring Investigation

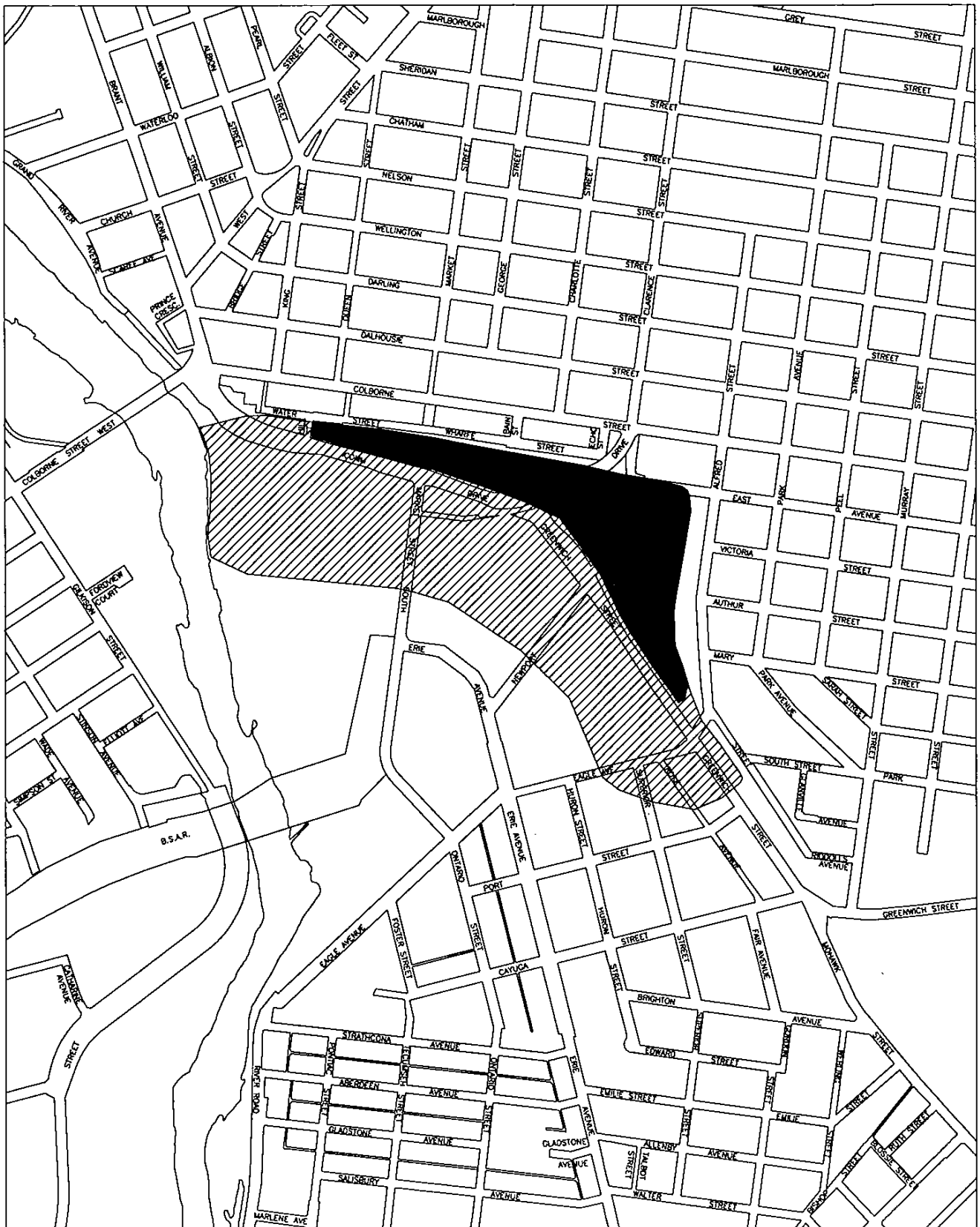


Figure B-3

Abandoned Landfill Site 2-3
Required Investigation Zone
for Groundwater Assessment



0 metres 100 200 300

Legend



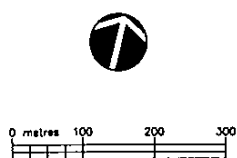
-  Estimated Extent of Fill
-  Area Requiring Investigation





Figure B-4

Abandoned Landfill Site 2--4
Required Investigation Zone
for Groundwater Assessment



Legend

 Estimated Extent of Fill
 Area Requiring Investigation

**APPENDIX IV-C
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CATEGORY 3 ABANDONED LANDFILL SITES

Category 3 sites are those that are generating significant quantities of methane gas (methane gas). Geotechnical investigations including testing for the presence of methane gas and chemical analyses of soil and groundwater samples should be required on Category 3 sites prior to any change in land usage on the sites. The chemical analytical results should be compared against Table B in the Ministry of Environment A Guideline for Use at Contaminated Sites in Ontario. Shallow soil gas surveys for methane can be conducted by probing about one metre into the soil and testing the soil vapour using a hand held gas detection instrument calibrated to detect methane gas. The probe holes should be located on a 10 by 10 metre grid as a minimum in the area of development.

Methane gas is mobile in the subsurface above the groundwater table. A mixture of 5 to 15% methane in air can explode if ignited. This can be very dangerous in confined spaces. For this reason, investigations for methane gas should be conducted prior to proposed land use changes on landfills actively generating methane gas and lands adjacent to landfills which are generating significant quantities of methane gas.

Category 3 sites that are generating significant methane gas are Sites 3-1, 3-2, and 3-3.

The radius of lands to be investigated was calculated by multiplying the estimated unsaturated thickness of the landfill (H) by 30. In the past, the Ministry of Environment considered ten times the unsaturated thickness to be a distance sufficient to reduce the methane gas concentration to a safe level (10 % of the lower explosive limit of methane in air). Applying this formula $R = 30 H$, for the Category 3 landfills yields a 180 metre radius of investigation for Sites 3-1, 3-2 and 3-3 since they have an unsaturated thickness of about six metres. At the sites where the terrain is level investigation for methane gas should be conducted around the entire landfill. Where the terrain has significant slope, investigation for methane gas should be conducted up slope from the landfill.

The radii of investigation are shown on Figures C-1, C-2 and C-3.

Figure C-1

Abandoned Landfill Site 3-1
Required Investigation Zone
for Methane Gas Assessment



Legend



Estimated Extent of Fill



Area Requiring Investigation

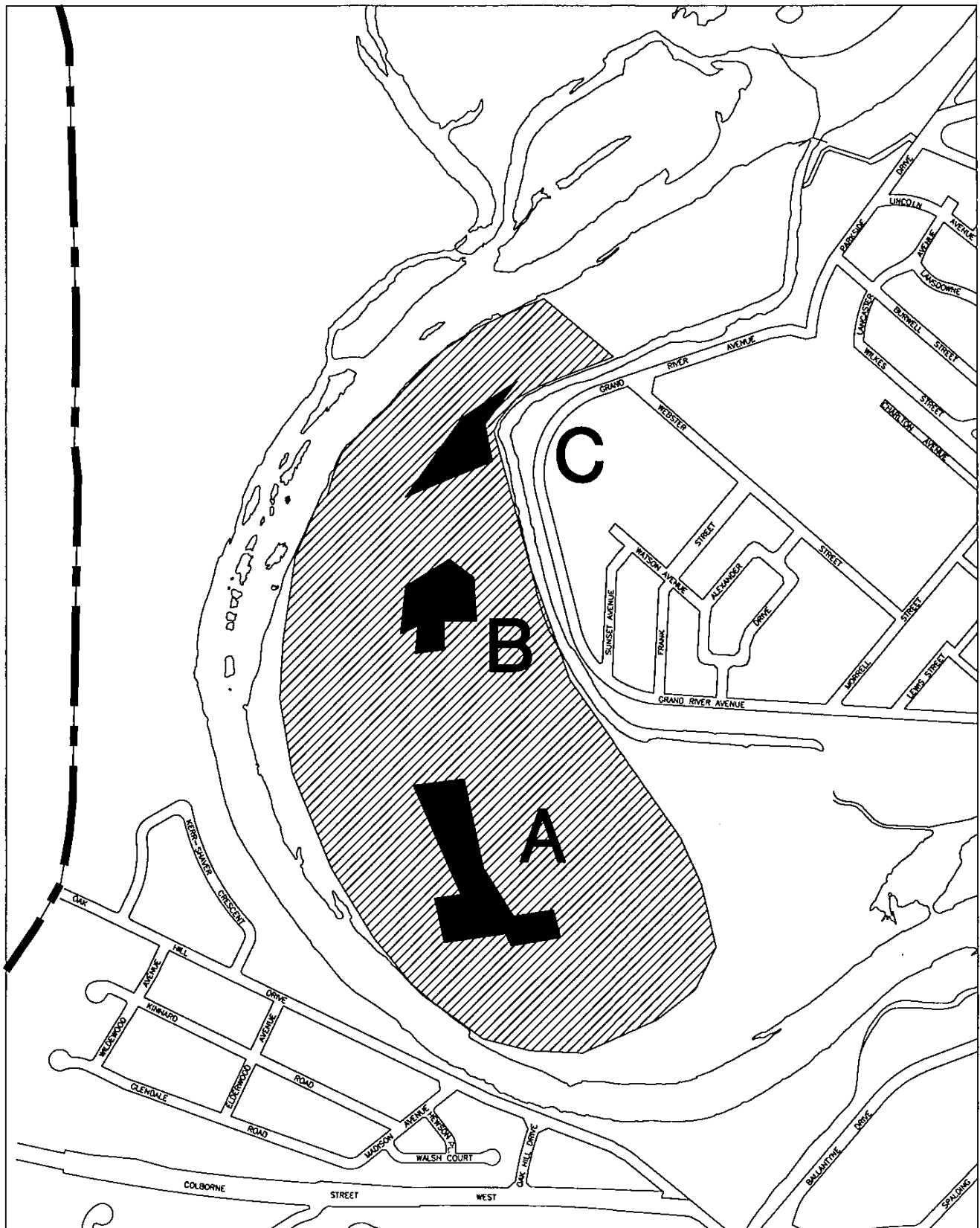


Figure C-3

Abandoned Landfill Site 3-3
Required Investigation Zone
for Methane Gas Assessment



0 metres 100 200 300

Legend



Estimated Extent of Fill



Area Requiring Investigation

**APPENDIX IV-D
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CATEGORY 4 ABANDONED LANDFILL SITES

Category 4 sites are those that are both actively generating significant quantities of methane gas and are adversely impacting groundwater. Geotechnical and environmental investigations should also be conducted on the landfills prior to any proposed change in land use. The environmental assessments should follow the principles of the Ministry of Environment A Guideline for Use at Contaminated Sites in Ontario. Investigations for methane gas and groundwater impact should be conducted on adjacent lands prior to any proposed change in land use on the adjacent lands.

A former municipal landfill located beneath the City's Water Pollution Control Plant and a former municipal landfill beneath Burnley Park are the only Category 4 sites.

Methane gas is the primary concern at both of the Category 4 sites because the City has taken measures to control off-site migration of impacted groundwater.

Investigations for methane gas should be conducted within a radius of 80 metres the Category 4 sites as shown on Figures D-1 and D-2 of this appendix. These investigations should be conducted in the same fashion as described for Category 3 sites.

The City has installed a groundwater collection trench parallel to Morrison Road, which intercepts and collects impacted groundwater migrating away from Site 4-1. This trench also acts to vent methane gas along this side of the former landfill. Therefore, the only potential off-site impact is methane gas that may migrate northward across Mohawk Street.

The City has also installed an interceptor trench down gradient of Site 4-2 to collect shallow groundwater impacted by the landfill. Therefore, no zone of investigation for groundwater impact is shown on Figure D-2.

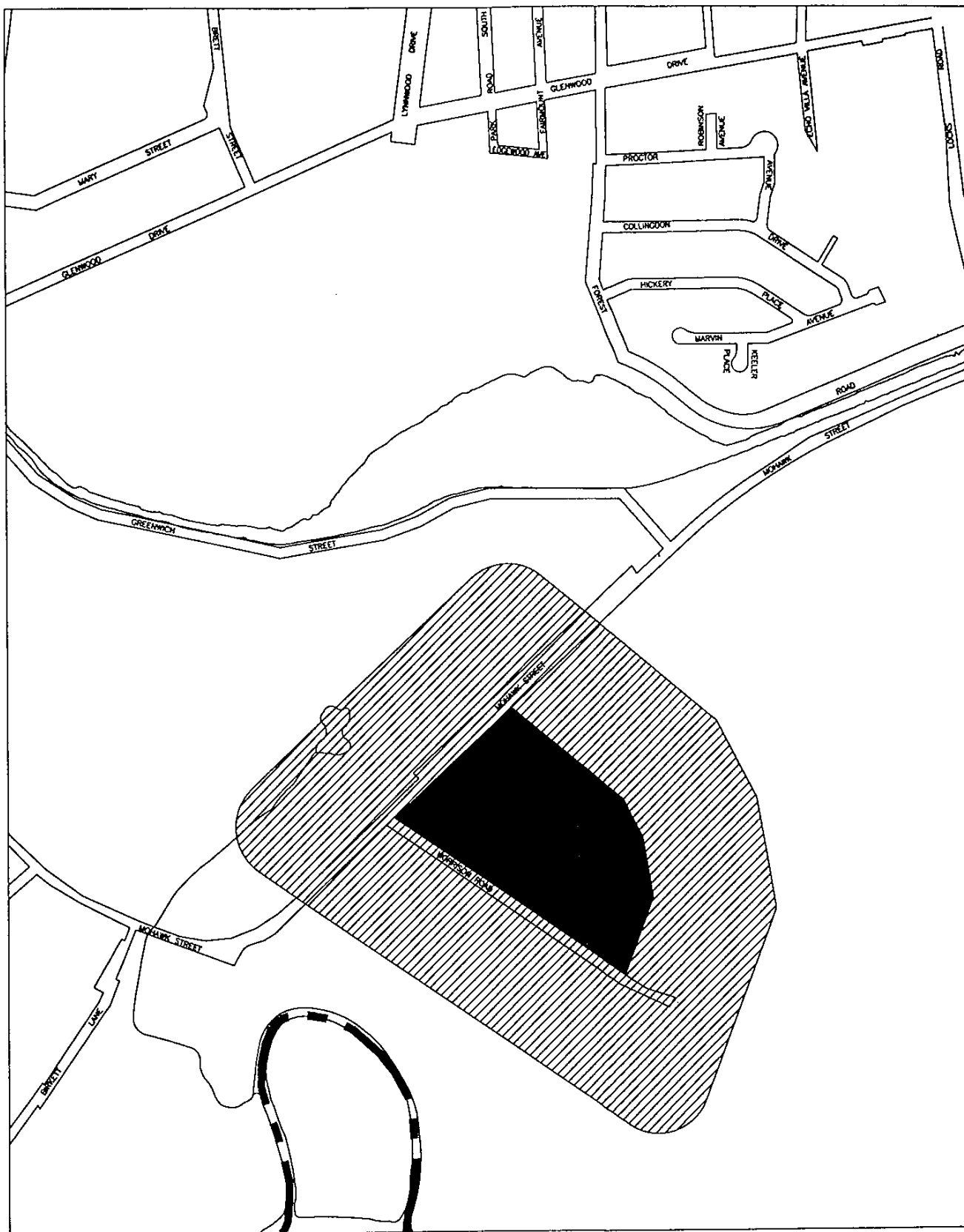


Figure D-1

Abandoned Landfill Site 4-1
Required Investigation Zone
for Methane Gas Assessment



0 metres 100 200 300

Legend



Estimated Extent of Fill

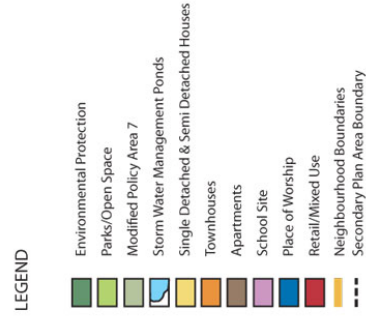
Area Requiring Investigation

Figure D-2

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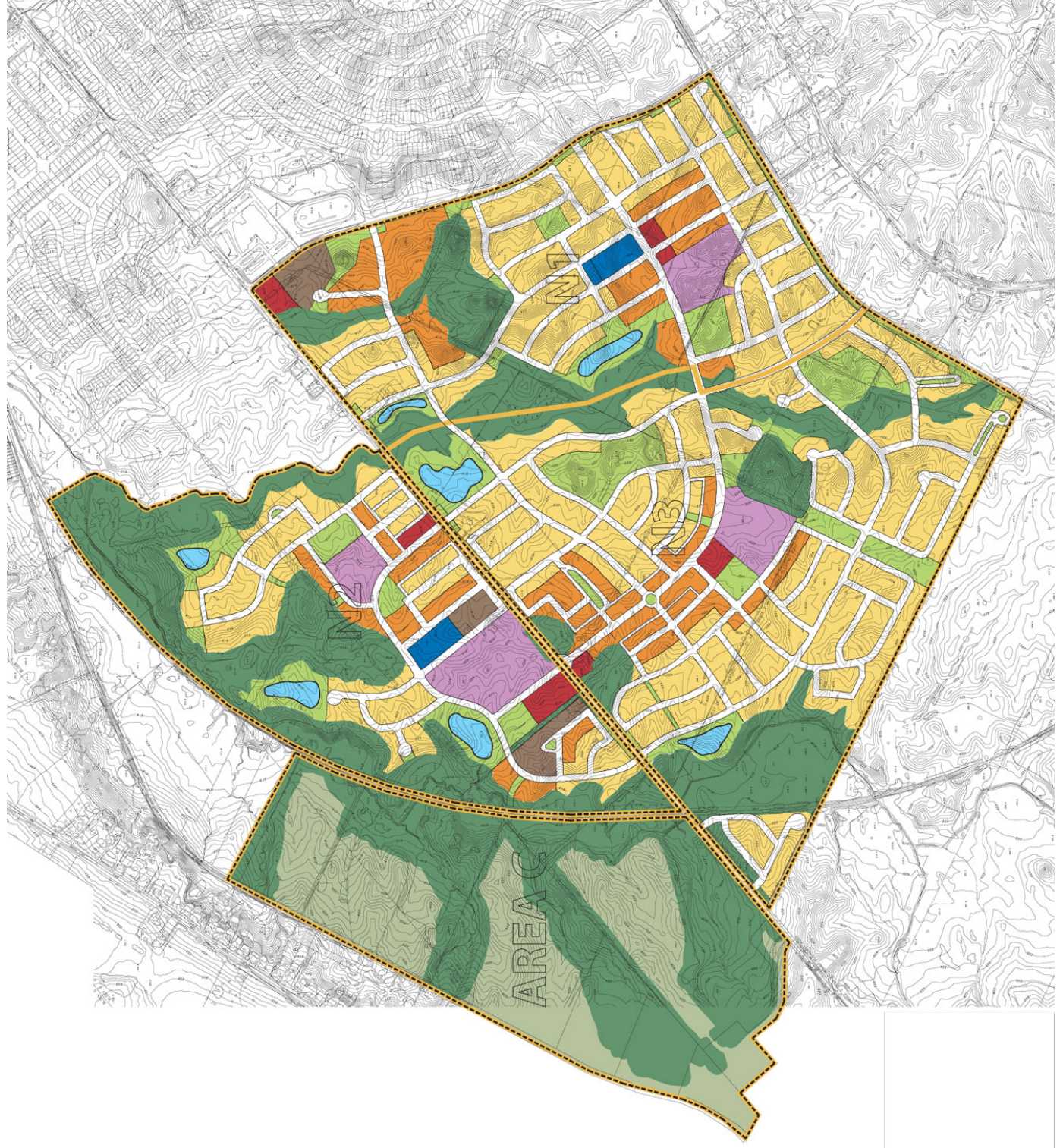
DEMONSTRATION PLAN
AND
URBAN DESIGN GUIDELINES

Demonstration Plan



March 2008

The Planning Partnership
URS Canada Inc.
LGL Limited
JTB Environmental Systems Inc.
ASI Inc.



**Urban Design Guidelines - Southwest Brantford, West of Conklin Road Study Area
March 2008**

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1.0 Introduction

The West of Conklin Secondary Plan is designed based on achieving a community that is diverse in use and population, is scaled to the pedestrian, can accommodate private automobiles and transit vehicles, and has a well designed and high quality public realm. The Plan is also premised on achieving high quality urban design, including measures to ensure:

- a standardized and highly interconnected pattern of lotting for development blocks;
- consistent built form;
- safety, accessibility and comfort in the pedestrian environment;
- achievement of an overall density within each neighbourhood of at least 50 residents and employees per net hectare; and,
- support for transit services throughout the community.

This Demonstration Plan and Urban Design Guidelines document have been prepared in conjunction with the Southwest Brantford, West of Conklin Secondary Plan. The purpose of this document is to provide a demonstration of how the principles of the Secondary Plan could be realistically applied to future development and further detail as to how the City's vision and design objectives are to be achieved.

The Urban Design Guidelines provide design principles and specific guidelines for both the public and private sectors. While they are intended as a reference, they indicate the City of Brantford's expectations with respect to the character, quality and form of development in the West of Conklin community. The guidelines also provide the City of Brantford's staff with an objective, consistent evaluation framework to assess development applications.

**Urban Design Guidelines - Southwest Brantford, West of Conklin Road Study Area
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2.0 The Demonstration Plan

The Demonstration Plan identifies three neighbourhoods and Area C. They are described as follows:

- Area C is an unique area, with a complex and environmentally sensitive landscape. Further, more detailed, environmental, land use planning and engineering work is required prior to identifying any urban development forms in this area;
- Neighbourhood 1 (N1 on the Demonstration Plan) is south of Shellard Lane and west of, and abutting Conklin Road. It incorporates approximately 95 gross hectares of land, of which about 53 hectares (56 percent) is developable. It is estimated that N1 will accommodate a minimum of 930 dwelling units, including single-detached and semi-detached houses, townhouses, and low-rise apartment dwellings. Small-scale retail uses, an elementary school and other institutional uses are also anticipated. The overall density of N1 will be in excess of 50 residents and employees per net hectare;
- Neighbourhood 2 (N2 on the Demonstration Plan) is located north of Shellard Lane, adjacent to D'Aubigny Creek. It incorporates approximately 88 gross hectares of land, of which about 32 (36 percent) is considered developable. It is estimated that N2 will accommodate a minimum of 510 dwelling units including single-detached and semi-detached houses, townhouses, and low-mid and/or high rise apartments. Moderately scaled retail uses, a Secondary School, an elementary school and other institutional uses are also anticipated. The overall density of N2 will be in excess of 50 residents and employees per net hectare; and,
- Neighbourhood 3 (N3 on the Demonstration Plan) is located south of Shellard Lane, west of N1. It incorporates approximately 128 gross hectares of land, of which about 58 hectares (45 percent) is considered developable. It is estimated that N3 will accommodate a minimum of 985 dwelling units including single-detached and semi-detached housing, townhouses and low-rise apartments. Small scaled retail uses and an elementary school are also anticipated. The overall density of N3 will be in excess of 50 residents and employees per net hectare.

These Urban Design Guidelines include a Demonstration Plan. It is the intention of the Demonstration Plan to provide an example of community development utilizing the policies of the Secondary Plan. It is not intended that the Demonstration Plan be interpreted as the only community development alternative. As such, no formal amendment process is required to promote a Neighbourhood Design Plan or Draft Plan of Subdivision, that is different from the Demonstration Plan, provided that the City is satisfied that the goals and objectives of the Secondary Plan are achieved.

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The Demonstration Plan illustrates the planning principles that are inherent to the Secondary Plan. It is one example of how the Secondary Plan might be implemented within the Secondary Plan Area. The Demonstration Plan itself does not require any formal Amendment process to implement an alternative design solution, or solutions at any time in the future.

The Demonstration Plan for the Southwest Brantford, West of Conklin Study Area, was the result of a design process that was carried out over a 4-day workshop held in Brantford (June 7-10, 2006). The Plan developed at the workshop has been subsequently refined as additional information was received over subsequent months. The Demonstration Plan, which appears on the following page, includes the following features:

- neighbourhood centres that are within a 5-minute walk of the majority of the community and provide local retail services and a neighbourhood focus;
- a linked greenlands system that connects natural/environmental features, open spaces, parks, schools, storm water management ponds and the neighbourhood centres;
- protection of all significant natural heritage features while incorporating them into a larger system providing for pedestrian and cycling trails;
- reinforcing neighbourhood centres by focusing medium and higher density residential uses and institutional uses on adjacent lands; and,
- a highly interconnected road pattern with a collector road system that is within a 5-minute walking distance of most future residents, which is specifically intended to support future transit services in the community.

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3.0 Design Guidelines for the Public Realm

The public realm within the West of Conklin Secondary Plan Area comprises public roads, lanes, open spaces/parks, natural heritage features and their associated buffers, storm water management facilities and the public use activity areas of other public lands and private development sites and buildings. Further, it is the intent of the Plan to link all of the components of the public realm with a connected system of trails, bicycle paths and sidewalks.

This section of the document provides general guidance for the design of all the components of the public realm. These Guidelines are to be read in conjunction with the policies of the West of Conklin Secondary Plan.

3.1 General

1. To promote safety and security in public places, including roads, parks and open spaces, schools, public transit routes and the public use activity areas of buildings, the following measures are necessary:
 - the design and siting of new buildings shall provide opportunities for visual overlook and ease of physical access to adjacent roads, parks and open spaces;
 - clear, unobstructed views to parks and open spaces shall be provided from the adjoining roads;
 - appropriate lighting, visibility and opportunities for informal surveillance shall be provided for all walkways, parking lots, garages and outdoor amenity areas; and,
 - public use activity areas located within buildings shall be located at-grade and oriented to the public road.
2. To ensure ease of access for the pedestrian and the enjoyment of public roads and other outdoor spaces, the following measures are necessary:
 - the principle access to the required service areas on the lot is from the exterior side yard,
 - public-oriented spaces and activity areas, including building entrances, terraces and porches, will be oriented toward public roads;
 - provision of a consistent level of streetscape design, incorporating such elements as appropriate paving, planting, fencing, lighting and signage; and,
 - avoiding the location of building ventilation systems in pedestrian areas.

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3.2 Roads

General

1. Provide a grid of arterial, collector and local roads and associated public open spaces that organize development, is pedestrian friendly, is highly connected and supports transit.
2. Ensure that the road pattern creates development blocks that are logical and achieve an orderly pattern of development.
3. Provide access for vehicles, pedestrians and bicycles, opportunities for vistas, view corridors and pedestrian amenity areas, and space for utilities and services.
4. Design all streetscape elements such as paving patterns, seating, and signage, to be consistent and complementary to the character of the community.
5. Design street lighting with regard for vehicular and pedestrian requirements so that the size, height, and style of lighting reflect the hierarchy of the road.
6. Locate all utilities underground. Where components of utilities must be located above ground, they should be located either in a rear lane or along the street tree planting line to minimize clutter and disruption of the road's character.



Residential units define the street edge



Utilizing lanes for more than garage access



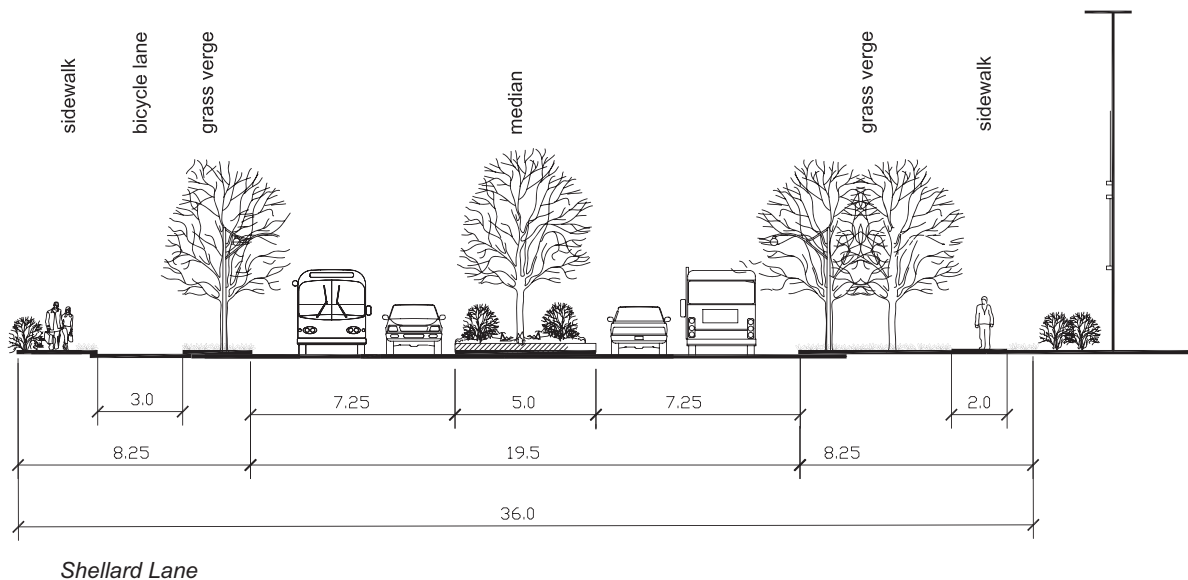
A residential road with street trees and planted centre median

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Shellard Lane (Arterial Road)

Shellard Lane provides access within the Secondary Plan Area, its surrounding neighbourhoods and the broader City of Brantford. It serves a range of travel modes, including passenger vehicles, transit and bicycles.

1. Shellard Lane shall have a maximum right-of-way of 36.0 metres.
2. The road surface, including a median/left-turn lane, shall be a maximum of 19.5 metres.
3. Boulevards on both sides of the pavement area shall be a minimum of 8.25 metres, and will include a grass verge, street trees and 2.0 metre sidewalks on both sides. One boulevard will accommodate a 3.0 metre dedicated bicycle path.
4. A centre median shall be a minimum of 5.0 metres. It will include street trees, shrubs and ground covers.
5. Transit facilities may be accommodated on Shellard Lane.
6. Individual, direct access from any development site to Shellard Lane shall not be permitted.
7. Buildings that abut Shellard Lane shall present a facade with architectural detailing and landscape features that address the Shellard Lane frontage. Reverse frontage development shall not be permitted adjacent to Shellard Lane



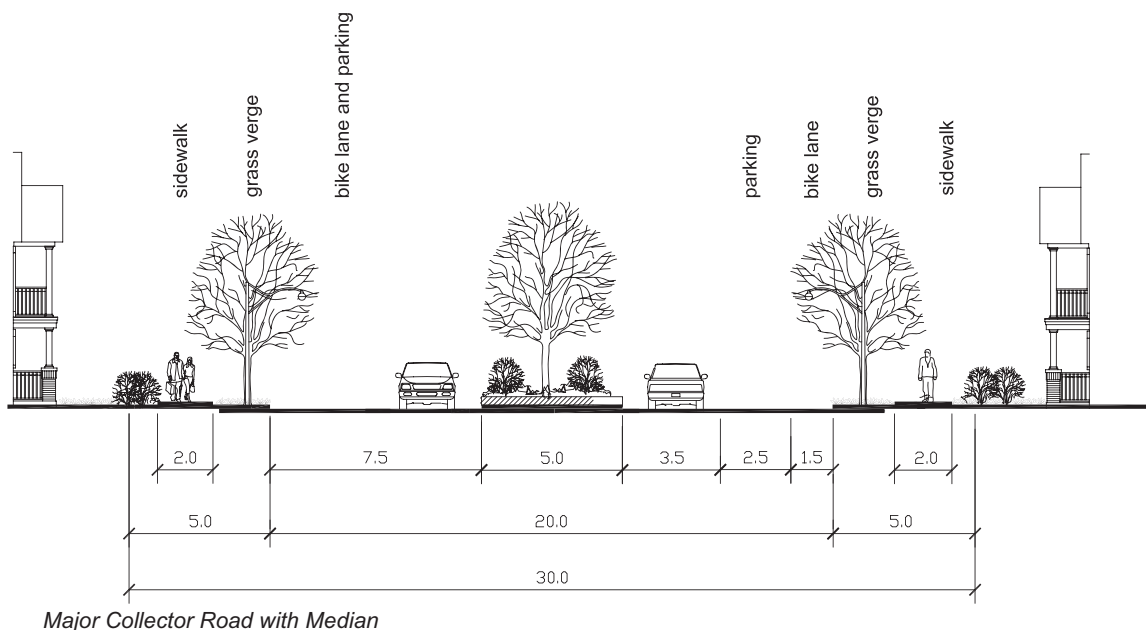
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Collector Roads

Collector Roads provide important connections between residential neighbourhoods and other community functions. They typically define the community structure.

Major Collector Road with Median

1. Major Collector Roads with a median shall have a maximum right-of-way width of 30.0 metres.
2. The road surface, including a median, a shared parking/cycling lane in each direction shall be a maximum of 20.0 metres.
3. Boulevards on both sides of the pavement area shall be a minimum of 5.0 metres and will include a grass verge, street trees and 2.0 metre sidewalks on both sides.
4. A centre median shall be a minimum of 5.0 metres. It will include street trees, shrubs and ground covers.



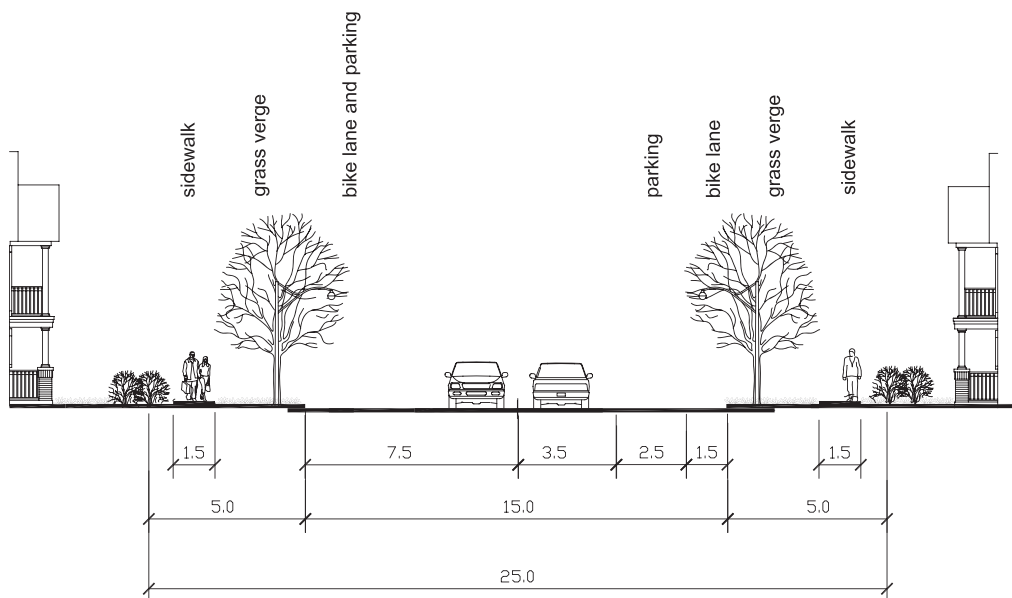
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5. Transit facilities may be accommodated on any Major Collector Road.
6. Individual direct access to any development site abutting a Major Collector Road shall be limited to minimize disruptions to traffic flow and to maximize safety and the attractiveness of the road. Within any area designated as a Village Centre or Neighbourhood Centre within the West of Conklin Secondary Plan, individual direct access from a Major Collector Road to any development site shall not be permitted.
7. Buildings that abut Major Collector Roads with Medians shall present a facade with architectural detailing and landscape features that address the road frontage. Reverse frontage development shall not be permitted adjacent to any Major Collector Road.

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Major Collector Road

1. Major Collector Roads with no medians shall have a maximum right-of-way of 25.0 metres.
2. Road surface should be 15.0 metres, including a shared parking/cycling lane in each direction and an optional parking lay-by on both sides of the road.
3. Boulevards on both sides of the pavement shall be a minimum of 5.0 metres and will accommodate a grass verge with street trees and 1.5 metre sidewalks on both sides.
4. Transit facilities may be located on any Major Collector Road.
5. Individual direct access to any development site shall be limited to minimize disruptions to traffic flow and to maximize safety and the attractiveness of the road. Within any area designated as a Village Centre, or Neighbourhood Centre within the West of Conklin Secondary Plan, individual direct access to any development site shall not be permitted.
6. Buildings that abut Major Collector Roads shall present a facade with architectural detailing and landscape features that address the road frontage. Reverse frontage development shall not be permitted adjacent to any Major Collector Road.

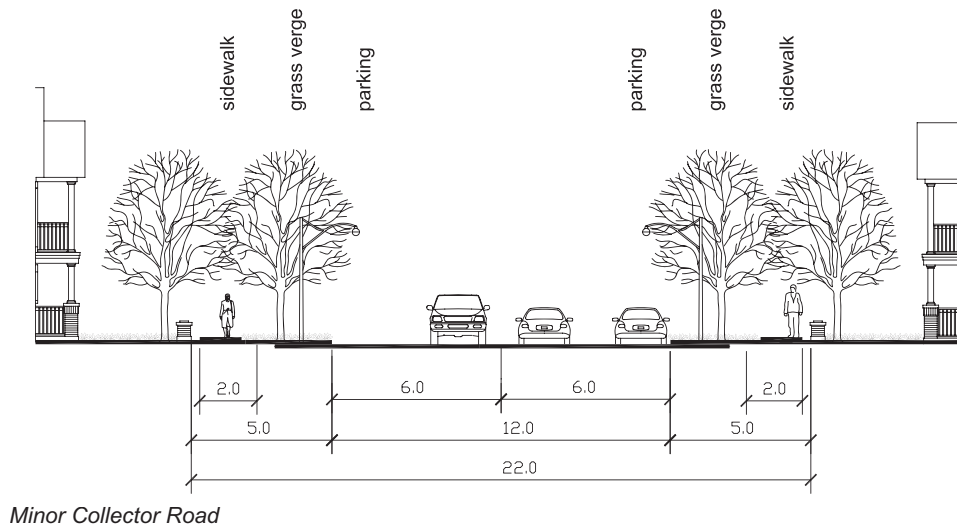


Major Collector Road

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Minor Collector Road

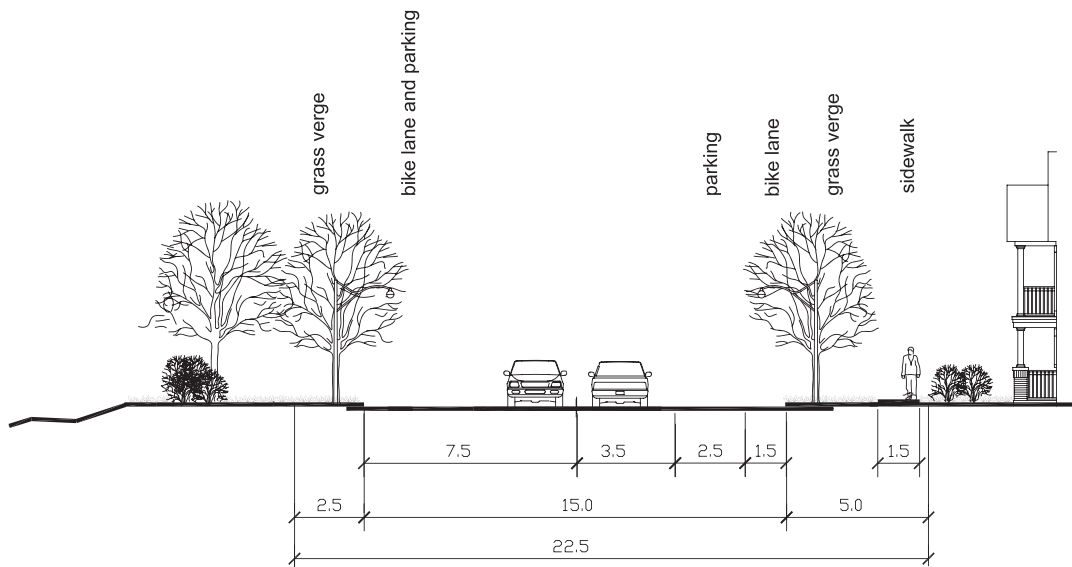
1. Minor Collector Roads shall have a maximum right-of-way of 22.0 metres.
2. The road surface, including parking lanes on both sides of the road shall be a maximum of 12.0 metres.
3. Boulevards on both sides of the pavement area shall be a minimum of 5.0 metres, and will include a grass verge with street trees and 2.0 metre sidewalks on both sides.
4. Individual, direct access from a Minor Collector Road is permitted, with the exception of within the Village Centre, where it is not permitted.
5. Transit facilities may be located on any Minor Collector Road.
6. Buildings that abut Minor Collector Roads shall present a facade with architectural detailing and landscape features that address the road frontage. Reverse frontage development shall not be permitted adjacent to any Minor Collector Road.



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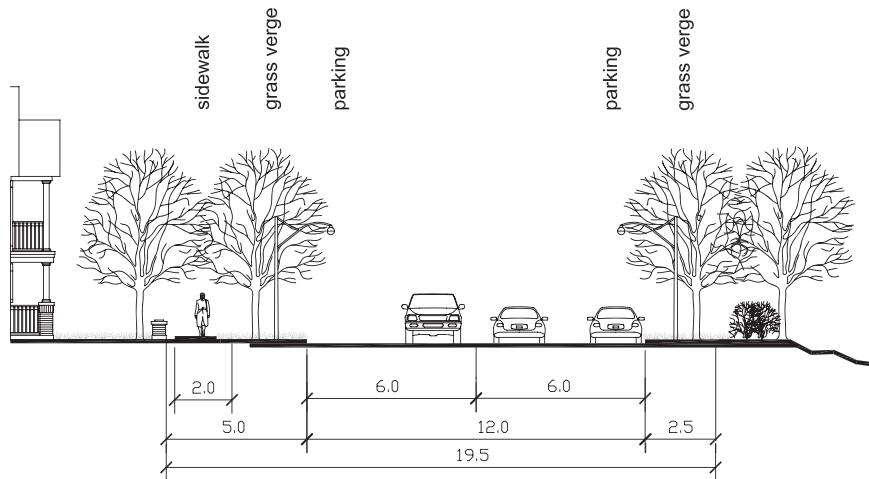
Single-Loaded Collector Road

1. Single-loaded Collector Roads are an attractive component of any community, providing visual and physical access to the greenlands system. They are also considered a cost penalty to the land developer. As such, in order to promote the inclusion of single-loaded roads, and to minimize the cost penalty, reduced boulevards are considered appropriate.
2. Where a Collector Road abuts a publicly owned storm water management feature, open space, parkland or an environmental feature, the boulevard that abuts the publicly owned lands may be reduced.
3. For any Major Collector Road, the boulevard width on the side of the greenlands feature may be reduced from 5.0 metres to 2.5 metres, reducing the overall right-of-way required by 2.5 metres.
4. For any Minor Collector Road, the boulevard width on the side of the greenlands feature may be reduced from 5.0 metres to 2.5 metres, reducing the overall right-of-way width by 2.5 metres.



Single-Loaded Major Collector Road

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Single-Loaded Minor Collector Road

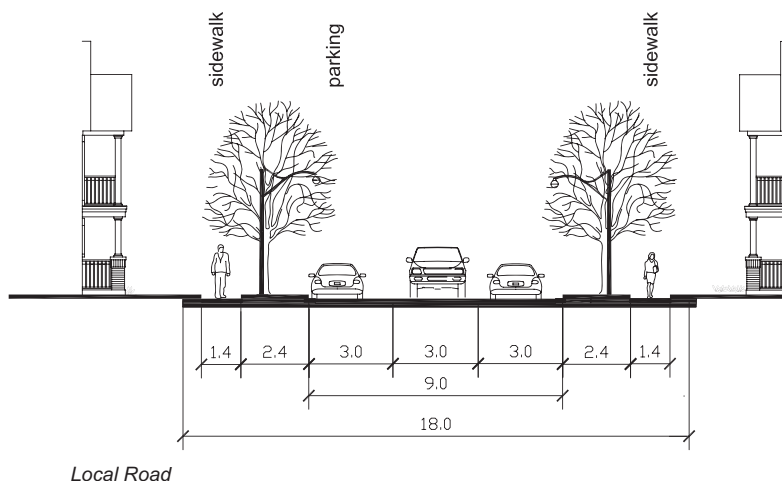
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Local Roads

Local Roads connect to Collector roads and link with public spaces.

Local Road

1. Local Roads should be designed with a maximum right-of-way width of 18.0 metres.
2. The road surface, including a parking lane on one side of the road (that could alternate to both sides of the road) shall be a maximum of 9.0 metres.
3. Boulevards on both sides of the pavement will accommodate a grass verge with street trees and 1.4 metre sidewalks on both sides.
4. Individual direct access onto Local Roads is permitted.
5. Buildings that abut Local Roads shall present a facade with architectural detailing and landscape features that address the road frontage.
6. Local Roads that are single loaded may include a 16.0 metre right-of-way, and a reduced boulevard abutting the publicly owned storm water management feature, open space, parkland or an environmental feature.

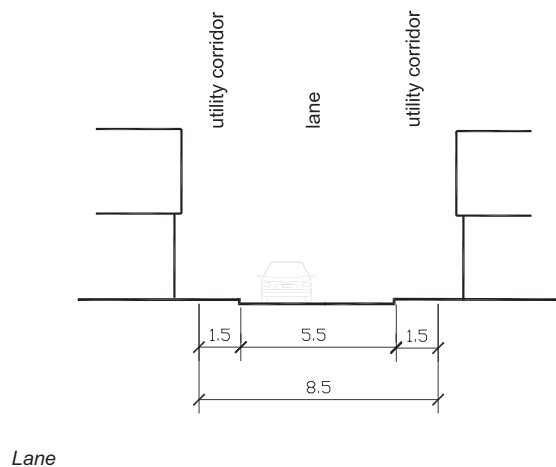


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Lanes

Lanes provide access to private garage facilities.

1. Lanes should be provided on roads where garages and front driveways will detract from the character of a special location, such as along Shellard Lane and/or the Major Collector Road which connects the Village Centre and Neighbourhood Centres.
2. Lanes shall have a maximum right-of-way of 8.5 metres.
3. The road surface shall be a maximum of 5.5 metres and shall include a 1.5 metre utility corridor on either side of the lane.
4. The use of permeable materials shall be encouraged in lane construction in areas where sufficient drainage exists.



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Green Streets

Green Streets serve a special function in the community in that they provide for increased permeability and pedestrian connections within the community. They are meant to encourage pedestrian travel through neighbourhoods and/or open space features and are desirable features in themselves. They are unpaved right-of-ways, that have buildings facing into them.

1. Green Streets can only be implemented in combination with a rear public Lane.
2. Green Streets should have a similar width as Local Roads with a maximum right-of-way of 18.5 metres.
3. Green Streets should have two 1.5 metres sidewalks with space on both sides to accommodate a double row of trees.
4. Green Streets will be mainly sodded with enhanced landscaping adjacent to residences to reinforce the special character of these roads and encourage pedestrian activity.
5. Green Streets can accommodate underground utilities as well as emergency access.



Dwellings fronting onto a green street have direct walkway connections



Traffic circle with mountable apron and planting

Traffic Circles

Traffic Circles are intended to calm traffic and direct traffic flows without necessarily requiring stop signs at intersections. The open spaces created in the traffic circles add to the character of neighbourhoods.

1. Whenever Traffic Circles are used, they should be significant landscape features, as well as traffic calming devices.
2. The design of a Traffic Circle should ensure ease of snow removal and maintenance.
3. The minimum radius for a Traffic Circle should be in accordance with Table 2.

Table 2: Standards for Traffic Circles

Intersection	Inscribed Circle Radius (i.e outside circle dimension)	Radius of Inside Circle (at Mountable Apron)	Turning Road Width
Local-Local	12	6	6
Collector-Local or Collector-Collector	15	8	7
Arterial-Single Lane	20	12	8
Arterial-Double Lane	27.5	18.4	9.1

3.3 Guidelines to Support Transit

1. Transit stops should be located as close to intersections as possible, and their location coordinated with neighbourhood trail connections and building entrances.
2. Transit shelters should be designed with transparent sides for maximum visibility to and from the interior, so that transit users can see approaching buses and to maximize pedestrian safety.
3. Shelters should be located on the boulevard adjacent to the pavement to maximize passenger convenience.
4. Curbside transit stop loading areas should be a clear, hard surface area 1.5 to 2 metres wide in front of a shelter should be provided to permit safe exit by passengers, including wheelchair users. In all cases, shelters should be set back 0.5 metres from curbs and sidewalks to protect them from damage by snowplows.
5. Surface texture changes should be provided at transit stops to assist the visually challenged in locating the stop and/or shelter location.
6. Where four-sided transit shelters are not possible, overhead open-air canopies should be provided to protect transit users from sun, rain and snow.
7. Benches and other roadside furniture such as waste baskets, bike racks, telephones, notice boards, newspaper boxes and refuse containers should be concentrated at bus stops within the Village Centre and Neighbourhood Centres to maximize their barrier free utility and create active public space.



Transit shelter with transparent sides provides maximum visibility



Transit shelter with overhead canopy

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3.4 Guidelines for Greenlands

The Greenlands System is a major functional and aesthetic component of a neighbourhood and should be designed to provide a fair distribution of amenity spaces for a range of users, in a linked network.

Natural Heritage Features

1. Significant natural heritage features within the Secondary Plan Area shall be protected and integrated into the community greenlands system.
2. Natural heritage features should be physically and visually accessible from the abutting roads.
3. Preservation of existing vegetation should be encouraged. Where necessary, indigenous and ecologically complementary planting should be encouraged.



Retaining natural heritage features contributes to sense of place

Neighbourhood Parks

1. Neighbourhood Parks within the Secondary Plan Area are expected to be diverse in scale, function and character. Currently, 10 Neighbourhood Parks have been identified on the Demonstration Plan. They range in size from 0.5 of a hectare to 3.5 hectares. (See Park and Trails Plan)
2. Each Neighbourhood Park is located to perform a particular function within its context. Generally, they are located to be a neighbourhood focal point, are adjacent to a school and/or are integrated with an adjacent natural heritage feature.
3. Neighbourhood Parks will provide opportunities for active and passive recreation for residents within a 400-metre radius (a 5 minute walk). Generally, they may include elements such as play structures, informal playgrounds, seating, hard surface areas, shaded areas under tree canopies or open air structures, group mailboxes, lighting, distinctive tree, shrub and ground cover planting.
4. Neighbourhood Parks should have significant road frontage on all four sides. At a minimum, parks shall front on at least two public roads.
5. Pedestrian access to parks should be clearly defined with landscape or architectural elements to ensure an appealing park presence.
6. Park design should ensure visual privacy for adjoining residents.
7. Where fencing is required, the design should be consistent around the perimeter of the park.
8. Street trees should be planted along the edge of parks, while not



Residential units front directly onto a park



Community mailbox adjacent to a park

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screening the view into parks.

9. Seating and shade areas should be designed in concert with pathways and play areas.

Urban Squares/Parkettes

1. An Urban Square is a small publicly accessible, primarily hard-surfaced open space built in conjunction with an adjacent building. A Parkette is a small component of the public open space system, that is typically soft surfaced and green. A parkette is most likely a park that connects larger pieces of the greenlands system.
2. Urban Squares/Parkettes shall be dispersed throughout the community. They are expected to provide key connecting links, and enhance the overall greenlands system.
3. Urban Square/Parkettes should be located on visible road frontages and their entries should be clearly defined through landscape treatment and built form elements.
4. Design should provide a focal area or feature that gives character and provides for a range of passive and informal uses.
5. Pathways within Urban Squares/Parkettes should connect to pedestrian sidewalks and trails.
6. View corridors terminating at an Urban Square/Parkette should be highlighted through landscape treatment and/or built form elements.
7. Plant material and construction materials should contribute to the distinctive character of Urban Squares/Parkettes.
8. Community mailboxes and information boards should be considered in Urban Squares/Parkettes.

Gateways

1. Streetscaping features at identified gateway corners shall include enhanced landscaping and coordinated fencing to frame the entry into the community (See Parks and Trails Plan).
2. Gateway features, such as community signage, low walls, fencing or enhanced landscape treatment, shall be incorporated in the design of entry road intersection and shall be coordinated in design and materials with adjacent structures and consistent along main road right-of-way.
3. Primary roads into the community should include a planted centre median and other design features to signify their importance.
4. Intersections should have distinctive surface treatment for pedestrian crossings, including wider sidewalks and connections



Street trees enhance the visual appearance of the park



Neighbourhood parkette



Parkettes create spaces for people to gather in



Landscaped gateway

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to bus shelters.

5. Noise attenuation features should be the last option for uses flanking onto the gateway sites. Where they occur, the material and architectural details shall compliment the adjacent structures, include landscaping and reflect the fencing details of community-wide fence standards.

Trail System

1. The highly interconnected trails system is identified conceptually on the Parks and Trails Plan. The trails system includes trails within natural features, storm water management facilities, open spaces and parks and the road system - sidewalks and bicycle paths.
2. Trail design and type will be based on each site's sensitivity in order to minimize environmental impacts.
3. Trails for pedestrians and cyclists shall be a maximum of 3.0 metres wide. Pedestrian-only-trails shall be a maximum of 2.0 metres wide.
4. Trails will be designed to accommodate a range of users and abilities. Slopes, where possible, should be under 5 percent. Curb-cuts must be provided to improve access at road crossings. The use of permeable materials shall be encouraged in trail construction in areas where sufficient drainage exists.
5. Trails should be clearly signed regarding permitted use and speed. Wayfinding signage shall be provided throughout the trail network.
6. Benches and garbage receptacles should be provided at trail heads and at regular intervals along the route.
7. Trails located in proximity to sensitive natural features, or adjacent to storm water management facilities should incorporate interpretive signage at various locations to promote stewardship initiatives that will protect and enhance the features and functions of the natural environment.



Trail system



Trails provide opportunities for recreation

Storm Water Management Facilities

1. Storm water management facilities will be key features within the community contributing to the appearance and ambience, while achieving functional objectives related to flow moderation and water quality.
2. Ponds should be designed as multi-celled systems with a sediment forebay or alternative pre-treatment system and wet pond or wetland component and will be designed to achieve water quality (including thermal targets) and quantity control targets set out by the Ministry of the Environment, the Conservation Authority and the City of Brantford.



Pond enhancing natural landscape

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3. Where possible, ponds should include a permanent pool with an average depth of 1.2 to 1.5 metres and isolated deeper sections. Water depth will be varied and the length of the flow path from inlet to outlet maximized to enhance effectiveness and mitigate re-suspension of accumulated sediments. Ponds will achieve water quality targets by settling out sediments and contaminants, diluting storm water and arresting contaminants through biological uptake.
4. Storm water management ponds should be designed to include a high length to width ratio to provide greater opportunities for open water to be shaded, and to assist in achieving thermal targets for water quality.
5. Native species and flood tolerant water's edge plants, including a mixture of herbaceous and woody vegetation, shall be planted to stabilize banks of ponds. The perimeter of the permanent pool shall be planted with emergent, strand and submergent species to improve the aesthetics and enhance the performance of the facility.
6. Ponds are envisioned to blend with the natural landscape, therefore, geometric forms and standard slope gradients will be avoided in favour of organic shapes and landform grading designed to replicate natural landforms in the area. Inlet and outlet structures will be concealed using a combination of planting, grading and natural stone.
7. Where there is a need to discourage public access to areas around the perimeter of the ponds, living fences and barrier plantings will be utilized in place of fencing. Barrier plantings will be comprised of multiple rows of predominantly thorn bearing shrub species planted at a spacing of 0.6 to 0.9 metres contingent on species. Barrier plantings will be installed along the crest of steep slopes, adjacent deep-water areas and around inlet and outlet structures.
8. Ponds will not be fenced, but rather will be designed with trails, overlooks and interpretive signage so that they are an integral part of the greenlands system.



Ponds provide opportunities to create unique neighbourhood features



Playground adjacent to a storm water management feature



A pedestrian/cycling trail adjacent to a pond

4.0 Design Guidelines for the Private Realm

The private realm within the West of Conklin Secondary Plan Area is comprised of the built form development blocks and their relationship to open space and road with respect to their location. The residential, institutional and commercial/mixed use buildings within a community contribute to its character and can assist in further defining and complementing the public realm.

This section of the document provides general guidance for the design of built form and how it should address the streetscape and open space in the private realm. These Guidelines are to be read in conjunction with the policies of the West of Conklin Secondary Plan.

4.1 All Development

Development Blocks and Lots

1. All the available urban lands are to be subdivided into a series of development blocks, defined by a modified rectilinear grid system of public roads and lanes.
2. The size and configuration of each development block will:
 - be appropriate to its intended use;
 - facilitate and promote pedestrian movement; and,
 - provide a sufficient number and, where appropriate, a range of building lots to achieve cost effective and efficient development.
3. Each development lot in a block will:
 - have frontage on a public road; and,
 - be of sufficient size and appropriate configuration to accommodate development that reflects the planning and urban design policies set out in this Secondary Plan and companion Demonstration Plan and the Urban Design Guidelines.
4. A lot that does not have frontage on a public road may be permitted, provided the front lot line adjoins public open space fronting a public road, and the rear lot line adjoins, and has access from a rear lane (a "Green Street").
5. Development lots within either the Neighbourhood Centre or Village Centre designations, having substantial frontage on Shellard Lane and/or a Major Collector Road, may be permitted to have a second access to parking from either Shellard Lane and/or a Major Collector Road provided:
 - the lot contains a comprehensively designed mixed use development;

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- the principle access to the required service areas on the lot is from the exterior side yard,
- the need for a second access to parking can be demonstrated to be necessary to facilitate the development pattern, but will not interfere with, or promote unsafe traffic and pedestrian movement; and,
- the development pattern is otherwise consistent with the provisions of this Secondary Plan and the Demonstration Plan and the Urban Design Guidelines.

Built Form

1. A full range of housing types and tenures should be provided to make a variety of housing options available to the community.
2. Development should be designed to achieve a high degree of environmental sustainability within the community.
3. Architectural styles of individual units and blocks should be sensitive to and complement each other.
4. A variety of architectural elements such as entry porches, dormers, material detailing will be employed to create a distinctive character for each block.
5. New development will be compatible with adjacent and neighbouring development by ensuring that the siting and massing of new buildings does not result in undue adverse impacts on adjacent properties particularly in regard to adequate privacy conditions for residential buildings and their outdoor amenity areas.

To ensure that building compatibility is achieved, the implementing zoning by-laws will establish consistent relationships between buildings and their associated property limits.

6. To support public transit and for reasons of public safety and convenience, primary building entrances to principle buildings shall be clearly visible and located on a public road or onto public open spaces.

Access from sidewalks and public open space areas to primary building entrances shall be convenient and direct, with minimum changes in grade, and shall be accessible to people who are mobility challenged.

7. To minimize disruptions to traffic flow and to maximize safety and the attractiveness of Shellard Lane and the Major Collector Roads, individual direct vehicular access shall be minimized, and, in some cases prohibited, in accordance with the policies of this Secondary Plan.

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8. To enhance the quality and safety of the public streetscapes the construction of parking lots/structures which occupy significant proportions of the at-grade frontage of public roads shall not be permitted.
9. To reduce the impact of surface parking and to provide at grade amenity areas the provision of structured parking shall be encouraged for higher density forms of development in the Village Centre and Neighbourhood Centre designations. Where it is not feasible to locate parking in structures either below or above grade, parking should be located to the rear of principle buildings and/or within the exterior side yard.

Location of Buildings with Respect to Roads and Open Space

1. To reinforce the road, lane and block pattern, the following measures will be employed:
 - all buildings will be aligned parallel to a public road;
 - buildings will be located in proximity to the property line adjoining the public road;
 - siting and massing of buildings will provide a consistent relationship, continuity and enclosure to the public roads;
 - buildings located adjacent to, or at the edge of parks and open spaces will provide opportunities for overlook into the open space;
 - the massing, siting and scale of buildings located adjacent to, or along the edge of a park or open space will create a degree of enclosure or definition appropriate to the type of open space they enclose; and,
 - buildings of significant public use or architectural merit may be sited to specifically differ from the surrounding urban fabric in order to emphasize their importance as landmarks.

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Crime Prevention Through Environmental Design (CPTED) Principles

Crime Prevention Through Environmental Design or “CPTED” is an approach to crime prevention that takes into account the relationship between the physical environment and the users of that environment. The application of CPTED to urban design assists in the creations of spaces that are perceived as being safe.

There are four overlapping CPTED design strategies, namely:

- Natural surveillance;
- natural access control;
- territorial reinforcement; and,
- target hardening.

The guiding principle is “know thy neighbour”. Street and homes should be designed to encourage interaction between neighbours: good examples of these design elements are the front porch and property lines that are defined simply by low shrubbery instead of high fences. Below is a summary of CPTED guidelines applicable to residential buildings (detached, semis, links and townhouses):

1. Natural Access Control

- Walkways and landscaping direct visitors to the proper entrance and away from private areas.

2. Natural Surveillance

- All doorways that open to the outside should be well lit;
- the front door should be at least partially visible from the street;
- the front door should be flush with the wall of the dwelling (minimize recessed/alcoves);
- windows on all sides of the house provide full visibility of property;
- sidewalks and all areas of the yard should be well lit;
- the driveway should be visible from either the front or back door and at least one window;
- the front door should be clearly visible from the driveway;
- properly maintained landscaping provides maximum viewing to, and from the house;

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- landscaping, follow principle of '3:7' - ground cover no higher than 3 feet and canopy no lower than 7 feet;
- window placement- location of windows should provide adequate surveillance of the property and street while respecting neighbours' privacy; and,
- projections-dwelling design should not contain projections that might effect surveillance either from the immediate property and the surrounding community from within the house as well as the surveillance of the property from its neighbour (Note: This consideration should apply equally to unique houses such as corner lots and those bordering parks and other open spaces).

3. Territorial Reinforcement

- projections-dwelling design should not contain projections that might effect surveillance either from the immediate property and the surrounding community from within the house as well as the surveillance of the property from its neighbour (Note: This consideration should apply equally to unique houses such as corner lots and those bordering parks and other open spaces).
- Front porches or stoops create a transitional area between the street, and the home;
- property lines and private areas should be defined with plantings, pavement treatments; and,
- the street address should be clearly visible from the street with numbers a minimum of five inches high that are made of non-reflective materials.

4. Target Hardening

- Interior doors that connect a garage to a building should have a single cylinder dead bolt lock;
- door locks should be located a minimum of 40 inches from adjacent windows;
- exterior doors should be hinged on the inside and should have a single cylinder dead bolt lock with a minimum one-inch throw;
- all windows should have locks; and,
- sliding glass doors should have one permanent door on the outside; the inside moving door should have a hooking device and a pin.

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4.2 Residential Buildings

Single Detached & Semi-Detached Houses

1. Buildings must have front and exterior side facades parallel to the road with front doors, windows and entry features facing the road to create a consistent street wall.
2. The setback to the main building face should be from 4.5 to 6.0 metres from the edge of the right-of-way. The setback to a main building face, which could be the main front wall, second floor room over or beside the garage, or significant element such as a roofed porch or verandah.
3. Garages shall be set behind or flush with the main building face or accessed from a rear lane. Garage doors facing a public road, shall be set back a minimum of 6.0 metres from the road right-of-way. This guideline does not apply to Lanes.
4. Corner lots and homes facing or abutting parks are priority lots within the neighbourhood. The design of these homes shall include the following considerations:
 - where sides or flankage of buildings are visible, they should have windows, materials, and other architectural treatments equal to the front elevation of the house;
 - the main front entrance should be located on the exterior side elevation, corner windows and wrap-around porches should be included to emphasize a corner location; and
 - fencing around front and/or exterior side yards should not block the view of the sidewalk from the house; their height shall be limited to 1.2 metres, and they should be primarily open structures, not solid walls.
6. Porches, stairs, canopies and other entrance features can encroach into the required setbacks.
7. Entry features and other architectural elements shall be incorporated into the front elevation of the house to reduce the visual dominance of the garage and the front drive.
8. Shared or grouped driveways will be encouraged to reduce the amount of asphalt on front yards.

Townhouses

1. The siting, massing, and facade design of townhouse units shall be coordinated on a block-by-block basis.
2. The elevation of the townhouse block shall be articulated in a manner that provides variation between units, and reinforces common characteristics that visually unites the block.



The use of light and dark colours produces visual interest



Building projections, such as porches, provide transitional building elements



Single detached house with integrated garage



Variation in roof configuration creates diversity on streetscape

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3. Variety in the design of roofs is required to break up the massing of townhouse blocks.
4. The massing and built form of townhouse units adjacent to single/ semi-detached dwellings shall be broken down with architectural elements to promote visual integration.
5. Garages should be accessed from a rear Lane. Were they are not, garages should be paired to allow for more substantial front yard green space. Garages shall not protrude beyond the main front wall of the dwelling unit.
6. Side and rear elevations visible from public areas shall have upgraded facade treatments.
7. Corner unit designs are encouraged to provide significant corner features such as a wrap-around porch, wall articulation, turret or bay window.
8. Buildings sited at the end of view corridor, such as at a "T" intersection, elbow roads, traffic circles and on prime corner lots should be designed with significant architectural elements.



Townhouses with garages on rear lane



Low rise apartment complex with interior courtyard

Apartments

1. Apartment buildings should be oriented to front, face and feature the public road. A substantial portion of the building should front the public road at a minimum setback.
2. Entrances should be located and oriented to public roads.
3. Permanent parking, loading and service areas should be located in side or rear yards and set back from the front facade of the building.
4. A visitor drop off area should be located at the front of the building.
5. Rooftop mechanical equipment should be screened with materials that are complementary to the building.



Apartment building oriented to public road

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4.3 Residential Building Siting Guidelines

Appropriate siting of residential units and their architectural components contributes greatly to the community streetscapes. It can also be used as a tool in unifying the overall structure of a community.

General Siting Guidelines

For the purpose of these guidelines a block is defined as being composed of contiguous lots surrounded by streets.

1. Each block shall contain a mix of unit types with a variety of elevations;
2. Placement of houses with the identical elevations and colour treatment next to each other is not permitted. Identical unit elevations shall be separated by a minimum of two dwellings;
3. Each model design shall have 2 distinctly different elevations, while popular models may require more than 2 elevations to avoid repetition and monotony within the streetscape;
4. Identical exterior colour packages shall be separated by a minimum of 3 dwellings;
5. The front facade wall should be sited close to the front lot line where possible, in keeping with permitted zoning;
6. A range of building front setbacks is encouraged for diversity on the street;
7. Entry doors should be visible from the street. Enclosure of porches is not permitted;
8. When siting different unit types on a street, appropriate transition should be considered to avoid drastic changes in height.; and,
9. Priority lots are the "character" lots of a development and a higher level of architectural design is expected for units on those lots as described in Section 4.4.

Siting Guidelines for Semi-Detached and Linked Dwelling Units

In addition to satisfying the general siting requirements, siting of semi-detached and linked dwelling units shall conform to the following guidelines. For the purpose of these guidelines, a semi-detached unit shall be defined as a dwelling with 2 attached units (left and right elevations).

1. When sited on a corner lot, the semi-detached unit should have a corner unit design with upgraded flankage and rear elevations as noted in Section 4.4, Corner Units.; and,
2. The rear elevations of both semi-detached units on a corner lot shall be up-graded.

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Siting Guidelines for Single Storey (Bungalow) Units

In addition to satisfying the general siting requirements, the siting of single storey (bungalow) units shall conform to the following guidelines;

1. A minimum of 2 single storey units shall be sited together on interior lots, with a minimum of 2 two storey units sited on adjacent lots;
2. Siting of 1 single storey unit between 2 two storey units will be discouraged unless it displays a minimum 1 1/2 storey appearance and massing; and,
3. The siting of bungalow units on corner lots or lots adjacent to corners, shall not be permitted.

Siting Guidelines for Townhouse Units

In addition to satisfying the general siting requirements, siting of townhouse units shall conform to the following guidelines.

1. When sited on a long street, individual townhouse blocks should be sited with varied building setback to provide visual diversity on the street;
2. The architectural features/ requirements noted in Section 4.4, Corner Units, are to be incorporated and if the corner unit rear wall plane is flush with the adjacent unit, then both unit rear elevations will require upgrades;
3. The massing and built form of townhouse units adjacent to single/ semi-detached dwellings shall be designed to promote visual integration; and,
4. Every effort should be made to screen utility meters on townhouse units from public view through the use of recessed walls, inseting within walls, landscaping, or other screening solutions that are provided by the builder.

Privacy Fencing Guidelines

1. Hedges, and garden walls are encouraged. They shall be limited to a maximum of 1m in height and be permeable to allow overview from public spaces;
2. Rear and side yard fences, where required, shall be consistent in design, colour, and materials and in accordance with any City standards; and,
3. Fences provided by a developer/builder shall be subject to review by the City or an approved Control Architect.

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Corner Lot Fencing

Corner lot fencing shall be provided in new communities and will conform to the following criteria:

1. Corner lot fencing shall be provided for screening of rear yard amenity area by the builder/ developer on all flankage lots where the rear yard is exposed to the street;
2. Corner lot and privacy fencing should be a minimum height of 1.8m or a height stipulated in a Noise Attenuation Report;
3. Where side yard fencing occurs the fence should meet the side of the house at a minimum distance of 1.5m - 2.0m from the rear corner of the unit, and may extend up to 1/4 of the length of the house or to a change of plane (i.e.. bump-out, bay window, etc.);
4. Corner lot fencing will be designed to incorporate a gate on the portion of the fence that returns from the lot line to the side wall; and,
5. The exact location of corner lot fencing will be determined in a subdivision agreement.

Noise Attenuation Fences and Walls

1. Acoustic fences along arterial roads shall provide adequate visual and physical buffer to the residences without creating an uninviting wall; and,
2. If masonry piers are used on acoustic walls they shall be the same material and colour with all other common entry conditions in a development.

4.4 Residential Buildings - Priority Lots

“Priority Lots” are lots within a proposed community that have high public exposure, such as corner lots or lots located adjacent to public open space. The building design on these lots should be of a high architectural quality. Architectural and siting treatments for different lot configurations are recommended, in order to promote a defined and an attractive streetscape with constructed focal points.

A Priority Lot Map that identifies and illustrates various priority lot treatments shall be provided by the Builder/Developer to the City once the draft plan for a proposed development has been finalized. Units shall be approved for siting, on Priority Lots, based on the guidelines set out below.

Gateway Units

Gateway units are units located at the entry to the community from the surrounding roads. Units shall be designed with the following principles in mind:

1. Gateway dwellings shall be given special consideration in architectural design, massing, orientation, siting and materials, and shall be of high architectural quality;
2. Entry elements and porches are encouraged to produce interest in the facade as well as to help define the entrance to the neighbourhood;
3. Pairing of similar model units on lots directly opposite each other to establish and enhance a gateway condition is encouraged;
4. Landscape and landscape features should be provided to accentuate gateways; and,
5. The architecture and landscape of the residence should coordinate with the architecture and landscaping of a community entry feature.

Corner Units

These guidelines apply to all corner lots, to units flanking on primary streets, and units where side yard to front yard conditions exist.

1. Special model designs specifically for corner lot conditions shall be offered for corner lots with at least two elevations per model.
2. Side and rear elevations visible from the street shall have consistent materials and details as per the front elevation;
3. Where the floor plan allows, a front door is encouraged on the side elevation of the house, with access to the sidewalk if a sidewalk exists. Other design solutions shall be considered;

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4. Entry doors should be visible from and oriented to the street;
5. Unit designs are encouraged to provide an architectural feature at the corner:
 - All corner unit designs shall have an option for a wrap-around porch;
 - Where no wrap around porch is provided, a portion of the units at the corner shall consist of an active living space, the facades of the unit facing the streets shall have window openings consistent with front elevations, and the use of special architectural features should be considered;
6. In cases where a townhouse is sited on a corner lot, the end units flanking a street are defined as priority lots. In cases where a semi-detached dwelling (2 units) is sited on a corner lot, both units will be defined as a priority lot; and,
7. Utility meters should be located on interior side elevation of detached units. For semi-detached units the meter can be located on the street facing elevation but it must be screened architecturally or placed inconspicuously at a wall jog. Townhome corners will be designed with recessed meters or be screened architecturally.

“T” Intersections/Elbow Streets

“T” intersections occur when one road terminates at right angles to another. Consideration should be given to homes at the top of the “T” intersection and the two last lots on either side of the road that terminates at the intersection. Elbow Streets occur at a bend on the road, with more than one unit at the end of the street view.

1. Architecture on lots at the end of “T” intersections shall have facade designs that utilize elements such as coordinated fenestration, masonry detailing, and entry elements;
2. Pairing of side yards is encouraged to form a landscaped area at the terminus of the “T” Intersection;
3. On elbow streets driveway locations shall be carefully considered to avoid driveways on adjoining lots merging at the street line; and,
4. Where side elevations on elbow streets are partially visible from the street, materials consistent with those of the front elevation should be employed.

Buildings Facing and Flanking Window Streets

1. Units visible from arterial roads shall be given special consideration in architectural design, massing, orientation, siting and materials and shall be of high architectural quality;

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2. Facades shall be highly articulated through coordinated fenestration, masonry detailing, accent gables, dormers, and/or other special treatment;
3. Units fronting onto a window street should have highly articulated entries through the use of entry features such as projecting porches facing the street;
4. Side and rear elevations flanking arterial roads shall be highly articulated, as per corner lots, and be consistent with the front elevation in terms of materials, fenestration style and detailing;
5. Garages are encouraged to be recessed from the front wall face of these units to reduce their presence on the street;
6. The siting of bungalows on window streets should be discouraged; and,
7. Entrances on window street lots should be visible to and where possible, face the window street.

Buildings Adjacent to Parks/Open Space/ Pedestrian Linkages

1. Front, side and rear elevations exposed to active public spaces including open spaces, wood lots, stormwater management facilities, greenway links, and pedestrian walkways shall be highly articulated. A combination of fenestration, bay windows, material changes and dormers may be used to achieve the objective;
2. Where possible side elevations facing parks and open spaces should incorporate a porch feature to visually address these features;
3. The location of porches, windows and entry doors of units, surrounding parks and parkettes, should provide opportunities for overview and safety;
4. Side and rear elevations should adopt a similar design and employ materials that are consistent with those used on front elevations. Architectural detailing such as corbelling should continue from front to side elevations, where visible to the public;
5. Projecting porches are encouraged to emphasize the entrance as well as to reduce the presence of the garage;
6. At walkway entrances, units should create a sense of entry through location of windows and front doors. Informal planting of coniferous and deciduous trees may be used to frame a pathway; and,
7. Driveways of adjacent homes should be located as far away as possible from the public space.

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4.5 Guidelines for Public/Institutional Buildings

Public/Institutional uses form an important aspect of community identity. Buildings serving these uses act as important built landmarks in the community. Careful attention must be paid to the design of these structures to ensure that they reflect the built quality and integrate with the scale of the surrounding neighbourhood.

1. Public/Institutional buildings should be sited prominently and where possible, should terminate views.
2. Public/Institutional buildings should front on Minor or Major Collector Roads and be located close to the road to reinforce the street wall and define intersections.
3. Public/Institutional buildings should set a high standard of architectural design and reflect the scale and character of surrounding neighbourhoods.
4. Special landscape features are encouraged to distinguish important landmark buildings at the pedestrian level.
5. Public/Institutional buildings should be designed as special landmark buildings with high quality design, materials and finishes. The site should be well landscaped in recognition of their prominent locations and status as landmark buildings.
6. Public/Institutional buildings should be located close to the road right-of-way to reinforce the road edge to create a visually dominant feature in the community.
7. The front door of all Public/Institutional buildings shall be connected with a walkway to the sidewalk on the road.
8. Vehicular parking should be located at the side or rear of the building. Parking for cyclists should be located near building entrances and where visual surveillance can be maximized.
9. Drop-off areas should be provided for buses and cars at the side of the building, but may be located in the front of the building subject to building design and site plan considerations.
10. Consideration for a road lay-by should be given for buses and cars.
11. Rooftop mechanical equipment should be screened with materials that are complementary to the building or through parapet height where applicable.



School located adjacent to natural Features



Projecting entry and tower element emphasize the main entrance



School reinforcing the road edge

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4.6 Commercial/Mixed Use Buildings

1. Retail/ commercial uses will be encouraged at the ground level and office commercial and residential uses are encouraged on the upper levels of buildings that front the square.
2. Both the residential and commercial components of buildings should be of quality construction and architectural details and should respond to neighbouring structures in massing, height and materials.
3. The side and rear of buildings abutting low to medium density residential properties should be of similar height as the residential dwellings or should be stepped to maintain an appropriate scale in relation to adjacent residential uses.
4. Buildings should be oriented to front, face and feature public roads, especially with buildings located at corners.
5. Building facades along the public roads should be articulated with colour, material variations, windows and other treatments of the wall plane to provide a high quality of design, detail, and variety. The design treatment of flanking facades visible from the road should be similar to that of the front facade.
6. All facades that overlook roads and open spaces should have windows. Reflective mirror glass should not be used for windows at grade.
7. Building facades should be treated as pedestrian areas and public spaces:
 - pedestrian areas in front of the buildings should be wide and well-landscaped with furniture, lighting and planting;
 - tree planting should be carefully planned with signage to avoid conflicts;
 - canopies should be considered to provide weather protection to pedestrians; and,
 - planting should be in large continuous planting beds.
8. Building entrances should be prominent and linked to sidewalk through walkways, covered porches or hard-surfaced patios.
9. Ground level floor-to-floor height should allow for conversion from residential to commercial uses.
10. The front yard could be either hard or soft surface, depending on use and should include a low, visually permeable fence at the edge of the sidewalk to define the semi-private areas and to add continuity to the streetscape.



Mixed use building overlooking onto public road



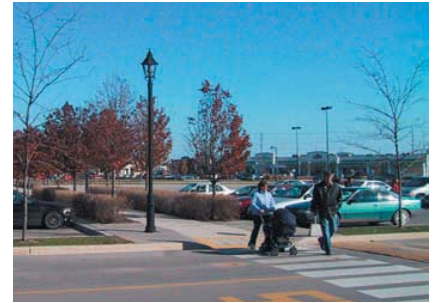
Variations in colours and materials create a visually appealing facade



Similar materials and colours encourage integration between different uses

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11. A variety of roof shapes should be considered to avoid the monotony of flat roofs.
12. All utility equipment, rooftop mechanical equipment, hydro transformers and garbage storage facilities should be incorporated into the design of a building. If this is not possible, equipment should be positioned so as not to be visible from the public road and screened with materials that are complementary to the building design.
13. Parking areas should be designed in small sections and include lighting, substantial landscaping, and special paving to break up expanses of parking and to provide places for pedestrian connections.
14. Trees, shrubs and ground covers should be planted at grade in wide, continuous planting beds that serve to define pods of parking and provide the preliminary pedestrian circulation.
15. Parking areas should be screened from view from roads, open spaces and adjacent residential areas with low fencing and planting.
16. Parking areas should be located at the side or rear of the development and set back from the road right-of-way.
17. Shared parking facilities and on-street parking will be encouraged in the calculation of required parking in Village/Neighbourhood Centres.
18. Servicing and loading areas should be located behind buildings and be screened from view. Conflicts between shipping vehicles and pedestrians must be minimized through signage and delineation of the pedestrian right-of-way.
19. Signage should provide a high level of clarity, visibility, and visual interest and shall complement the architecture of the building(s) in its scale, materials, consistency, and design.



A clear pedestrian route, enhanced by tree planting in retail plaza parking lot



Landscape treatment screens surface parking areas



A variety of complementing signage add interest to the facade

APPENDIX V-B
of the
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NET LAND / DENSITY / HOUSING MIX

APPENDIX V-B: NET LAND AREA/DENSITY/HOUSING MIX

ESTIMATED NET LAND AREA

TOTAL - Exclusive of env, os, swm and roads - 190 hectares
Net Residential - 160 ha
Net Commercial/Mixed Use - 9 ha (5% of total land area)
Institutional - 21 ha

RESIDENTIAL

Proposed Housing Mix
- 70 percent Singles and Semis
- 20 percent TH and Low Rise Apartments
- 10 percent Mid Rise and High Rise Apartments

Density Ranges By Housing Type

- Singles and Semis - 15 uph to 30 uph - based on 90 percent singles - 16.5 uph
- TH and LRA - 30 uph to 50 uph - based on 90 percent TH - 32 uph
- MRA and HRA - 50 to 100 uph - based on 90 percent MRA - 55 uph

Persons Per Household

- Singles and Semis - 3.0 pph
- TH and LRA - 2.5 pph
- MRA and HRA - 1.5 pph

Average Net Density Based on Proposed Housing Mix

= .7(16.5) + .2(32) + .1(55)
23.45

Average Persons Per Household Based on Proposed Housing Mix

= .7(3.0) + .2(2.5) + .1(1.5)
2.75

Average Persons Per Net Hectare

= 23.45 uph x 2.75 ppu
64.4875

Housing Yield - 3,750 dwelling units

Population Yield - 10,300 residents

COMMERCIAL/MIXED USE

Estimated at approximately 30 residents and/or employees per net hectare
Resident/Job Yield - 270 residents and/or jobs

INSTITUTIONAL

Estimated at approximately 15 jobs per net hectare
Job Yield - 315 jobs

TOTAL YIELD/DENSITY

Total Residents and/or Jobs - 10,885

Overall Density - 57 residents and/or jobs per hectare

APPENDIX V-C

**of the
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**EROSION AND SEDIMENTATION CONTROL PLAN DESIGN
REQUIREMENTS**

1.0 INTRODUCTION

The following identifies the minimum design requirements associated with an Erosion and Sedimentation Control Plan (ESCP) to be developed and implemented during the construction phase of a development proposal. The developed plan must be consistent with the requirements as provided in the document “Erosion and Sediment Control Guidelines for Urban Construction” dated December 2006. It is noted that the developed plan must be approved by all relevant agencies including the City of Brantford and the Grand River Conservation Authority and implemented prior to any work being undertaken on the subject property. The ESC Plan will include a design brief that outlines the current and proposed drainage conditions, includes all design calculations and appropriate design drawings that identifies specific details of what work is to be performed and timing.

It is the responsibility of the applicant to ensure that all permits are in place prior to any construction activity and that the implemented ESC Plan is monitored and maintained throughout the construction period. The release of any deleterious substances from the construction site will be the full responsibility of the property owner (applicant).

The following provides a summary of the requirements of the ESC Plan;

2.0 PERMIT REQUIREMENTS

The landowner will be required to obtain all relevant permits prior to any work being completed on the site. The agencies involved in the approval process will depend on the characteristics of the site and its proximity to environmental features. Approvals may be required from the following agencies;

1. City of Brantford
2. Grand River Conservation Authority
3. Ministry of Natural Resources
4. Department of Fisheries and Oceans

3.0 GENERAL SUBMISSION REQUIREMENTS

An ESC Plan shall include the following:

3.1 Basic information:

- a) Name, address and telephone number of the Owner;

- b) Names, addresses and telephone number of contractors, subcontractors or persons actually doing the site alteration and the scope of their responsibilities;
 - (c) Name, address, telephone number and e-mail address of the Professional Engineer responsible for the preparation and administration of the ESC Plan;
 - (d) Name, address, telephone number (including after-hours contact information) of the person responsible for road maintenance of the Site;
 - (e) Proposed dates of commencement and of completion of the site alteration;
 - (f) Signature of the Owner of the Site or authorized representative.
- 3.2 An irrevocable consent, signed by the Owner, authorizing representatives of the City and of the Conservation Authority to enter the Site to determine compliance with the ESC Plan or to perform any work necessary to bring the Site into compliance with the ESC Plan. A Letter of Credit is to be provided to the City for the purpose of ensuring that any deficiencies in the ESC Plan can be addressed by the Municipality if required.
- 3.3 An irrevocable undertaking signed by the Professional Engineer acknowledging that he/she is responsible for supervision and control of erosion and sedimentation control measures for the entire duration of the project and that he/she is authorized by the Owner to undertake repairs as required to maintain the integrity of the siltation and erosion control measures.

4.0 PRE-CONSTRUCTION INFORMATION

The ESC Plan shall include the following descriptive information with respect to the pre-construction state of the Site:

- 4.1 4.1 A key map of the site
- 4.2 Flood susceptibility information, including:
- a) a Regional Storm Flood Line;
 - b) Conservation Authority Regulation limits
- 4.3 Detailed drainage information, including:
- (a) existing storm water drainage;
 - (b) existing drainage areas that extend beyond the Site property boundary;
 - (c) the estimated peak runoff rates of the drainage areas within; and
 - (d) upstream of the subject site, and
 - (e) groundwater/well survey info.

- 4.4 Information about receiving water sensitivity, including:
 - (a) thermal regime of watercourse;
 - (b) preconstruction water quality;
 - (c) cold water fishery, (DFO);
 - (d) areas of Natural and Scientific Interest (MNR);
 - (e) biotic community in watercourse.
- 4.5 Overland flow paths and identification of flow concentration zones that affect the site including those that originate off-site;
- 4.6 Detailed mapping of the soil presently on Site, including:
 - (a) identification of erosion susceptible soils,
 - (b) location of main soil types,
 - (c) exploratory soil borings and their logs prepared by a Professional Engineer qualified in soil identification and characterization
 - (d) record of site condition, use, fill, contamination etc.
- 4.7 Location and type of existing vegetative cover, including:
 - (a) the location, species and diameter of all trees on Site, and
 - (b) the location of all hedge rows and environmental features to be protected.

5.0 SITE ALTERATION ACTIVITIES

The ESC Plan shall include the following information relating to the proposed site alteration activities:

- 5.1 A detailed description of the location and dimensions of all proposed site alteration activities.
- 5.2 A land alteration sequencing plan, setting out;
 - (a) timing of construction activities;
 - (b) sequencing of construction of erosion control measures;
 - (c) measures taken to minimize exposed areas and the duration of time for which they are exposed.
- 5.3 The location and dimensions of all temporary soil or dirt stockpiles;
- 5.4 The location of designated haul routes and construction access points to the site;
- 5.5 The location of siltation and erosion control measures to be installed on the site.

6.0 PERFORMANCE MEASURE FOR ESC PLAN

- 6.1 Each ESC Plan must be designed so as to illustrate that Best Management Practices have been implemented to minimize erosion and the transport of sediment. Controls must be designed to ensure that 100% of soil over 75 microns, and 90 % of soil particles of greater than 40 microns will not leave the property or escape into surface water under the 2 year design storm event. This event is considered to be the “Performance Measures”.
- 6.2 Each ESC Plan shall specify which sedimentation and erosion control devices and techniques are to be used to achieve the Performance Measure, and shall specify the location, dimensions, design details and design calculations of all proposed erosion and sediment control measures.
- 6.3 Any sedimentation and erosion control device or technique that is to be used must meet the minimum standards set out in Section 7.
- 6.4 All sedimentation and erosion control devices and techniques identified in an approved ESC Plan must be installed prior to any upgradient soil stripping.
- 6.5 A copy of the Control Plan, as well as a record of inspections, shall be maintained on the site at all times and submitted to the City and the Conservation Authority upon request.

7.0 STANDARDS FOR SEDIMENTATION AND EROSION CONTROL DEVICES AND TECHNIQUES

Standard Drawings for all ESC devices are included in the City of Brantford Design Standards. (See Appendix A for typical details).

- 7.1 All the activities on the Site shall be conducted in a phased manner whenever possible, to minimize the area of the site that has bare soil exposed at any one time.
- 7.2 Temporary Sediment Control Ponds (“Ponds”)
 - (a) Ponds must be implemented for all sites greater than 5 hectares in gross area under construction.
 - (b) Ponds shall be constructed prior to topsoil stripping or fill placement.
 - (c) Ponds shall be located at a point that intercepts runoff from the entire disturbed area. It may be necessary to construct more than one Pond on a Site to accomplish this objective.

- (d) Where it is not possible to place the Pond at a point that will capture all of the runoff from the entire disturbed area,
- (e) the reasons for the failure must be documented in the ESC Plan,
- (f) alternative sediment control measures that will ensure that all sediments are removed from the on-site runoff before the run-off leaves the Site must be proposed, and
- (g) the alternative measures must be constructed, once approval is granted by the appropriate agencies.
- (h) A centralized wet pond shall consist of:
 - (i) a permanent pool to contain accumulated sediment and post-storm waters;
 - (j) a water quality treatment volume (“Water Quality Treatment Volume”) that allows settlement of suspended sediment from storms.
- (k) Water Quality Treatment Volumes (or pond active storage volumes) are assessed based on the proposed ultimate development area with a minimum volume equivalent to a Level 1 water quality control as per the current Ministry of the Environment Storm Water Management Plan Manual or 125 m³/hectare, whichever is greater
- (l) Outlet works shall be designed to release storage over a 24 hour period.
- (m) The Pond shall incorporate maintenance benchmarks such as marked posts to indicate sediment depth.
- (n) The Pond shall be cleaned out when 50 % of the permanent pool volume has become filled with sediment.
- (o) The Pond outlet shall be through a perforated riser system.
- (p) The permanent pool shall:
 - (i) be 50 % of the Water Quality Treatment Volume;
 - (ii) be 1.3 metres to 1.5 metres average depth.
 - (iii) not exceed 2.0 metres in depth.
 - (iv) An overland flow swale is to be provided for major storm events.
- (q) The transition from the permanent pool to the Water Quality Treatment Volume shall be benched to prevent internal pond erosion and to allow equipment access to clean out the permanent pool.
- (r) The permanent stormwater management facility to be constructed to address the quality and quantity issues of the proposed development maybe used as a component of the ESC Plan. Refer to Section 8.2 for assumption requirements.

- (s) Ponds are to be cleaned out when the depth of sediment accumulation reaches 50% of the original permanent pool depth.
- (t) SWM ponds shall be constructed according to specifications, landscaped and connected to the receiver in tandem with the initial grading of the site.

7.3 Silt Fences

(a) Silt fences shall:

- (i) Be aligned with site contours to prevent the development of high water velocities that cause soil erosion.
- (ii) Be a minimum height of 800 mm.
- (iii) Be constructed of suitable woven or non-woven permeable geotextile fabric fastened with wire fasteners to post and rail wire fencing or acceptable equivalent. Fabric shall be placed on the upslope side and a minimum of 300 mm of the fabric shall be toed into the ground to a minimum depth of 150 mm.
- (iv) Supported with steel 'T' bar fence posts with a separation distance of no more than 2.5 metres
- (v) Have a vegetative buffer strip of no less than 3 metres downgradient of the fence for units installed on the perimeter of the property and a minimum of 15 metres downgradient of the fence for units installed adjacent to watercourses.
- (vi) Have deteriorated filter fabric replaced when it deteriorates due to physical damage or ultraviolet breakdown.
- (vii) Cleared of sediment when depth reaches 150 mm at the base of the fence.

It is noted that in addition to silt fences, there are other methods for perimeter control of a construction site such as siltsoxx interceptor swales / dykes, etc. The preferred approach is dependent on a review of the site condition.

7.4 Channel Low Point Protection

(a) Channel Energy Dissipating Devices shall:

- (i) Be constructed in internal cut off channels that will contain concentrated flows during storm events.
- (ii) Be constructed so that the crest of the downstream device is at the same elevation as the downstream base of the device further upstream.

- (iii) Be constructed of 100 mm to 150 mm clear crushed limestone with a downstream slope not to exceed 1 vertical in 4 horizontal and an upstream slope not to exceed 1 vertical in 1.5 horizontal.
- (iv) Be constructed with a non woven geotextile on the upstream face which is covered with 150 mm of 50 mm minimum diameter clear stone and which extends 300 mm or more downstream along the top of the device.
- (v) Be cleared of all accumulated sediment and restored to its original state after sediment has accumulated to a depth greater than 50 percent of the channel depth.

7.5 Construction Mud Mats

- (a) Construction Mud Mats shall be installed at all exits from the construction site where it is less than 300 m to a paved road. The purpose of the mud mat is to remove most of the sediment accumulated on vehicle tires and to prevent this sediment from washing into adjacent storm sewers and surface water systems
- (b) Construction Mud Mats shall:
 - (i) Be constructed prior to any other site stripping work.
 - (ii) Be constructed of 300 mm of 100 mm to 200 mm quarry stone placed on a geotextile material suitable for allowing exfiltration of water and preventing the quarry stone from becoming contaminated with the substrate soil.
 - (iii) Be a minimum of 8 m in width and extend a minimum of 30 m onto the site.
 - (iv) Be surrounded by silt fence and vegetative buffer as specified in section 7.9 for its entire length from the property line to the start of on-site roadways.
 - (v) Be continuously evaluated for effectiveness and if ineffective, alternative measures including wheel washing be implemented.

7.6 Topsoil and Spoil Pile Management

- (a) Topsoil and spoil piles shall:
 - (i) Not be constructed in low areas where water may accumulate.
 - (ii) Be surrounded with an appropriate silt fence to prevent sediment runoff during storms.
 - (iii) Be continuously monitored to ensure that silt fences are effectively capturing sediment.
 - (iv) Have ineffective silt fencing supplemented with a second row of silt

fencing 2 metres beyond the initial row.

- (v) piles containing more than 100 m³ of material shall be a minimum of 15 metres from a roadway or channel.
- (vi) If topsoil or dirt storage piles are to be left in one place for more than 60 days, piles shall be stabilized by mulching, vegetative cover, tarps or other means.
- (vii) Stock piles shall not be deposited on a paved road surface at any time.

7.7 Site Dewatering:

- (a) Dewatering operations may be conducted provided that the water is not permitted to discharge directly into receiving bodies of water or streams;
- (b) Water pumped from the Site shall be treated by structural devices such as sediment control pond, temporary sedimentation pond, grit chambers, sand filters, upflow chambers, swirl concentrators, filter socks or other appropriate controls.
- (c) Site dewatering must provide sufficient treatment to prevent deposition of sediment in the municipal storm drainage system or any harmful impact to the natural receiving streams. If the municipal storm drainage system is used as part of the erosion and sediment control plan then it is to be cleaned out prior to assumption by the City.

7.8 Drain Inlet and Catchbasin Protection

All potentially affected storm drain inlets and catchbasins shall be protected with filter fabric or equivalent barriers. This is acknowledged as an ineffective method of sediment control and shall only be proposed as a short term temporary sediment control measure. Two methods are available:

- (a) filter cloth protection over the catchbasin inlet which are suitable where ponding of water will not occur and where traffic will not affect the filter cloth;
- (b) catchbasin inserts constructed of filter cloth with or without a metal support structure.
- (c) Existing storm sewers maybe used as flow conveyance facilities provided that an appropriate detention facility is constructed at the outlet of the system. All sediment must be removed from the sewers prior to assumption by the City.

7.9 Vegetative Buffer Strips

- (a) Vegetative Buffer Strips shall:
 - (i) Be provided around the perimeter of the site and between disturbed areas and surface water
 - (ii) Be protected with silt fences from upgradient erosion
 - (iii) Consist of established vegetation that is growing on undisturbed soil
 - (iv) Be a minimum of 3 m thick from the perimeter of the property to the disturbed area and a minimum of 15 metres in depth from surface water to the disturbed area.
 - (v) Be immediately replaced with or supplemented with other control measures if they become ineffective.

7.10 Flow Diversions

Concentrated runoff from adjacent areas passing through the Site shall be diverted around disturbed areas. If this is not possible, runoff shall be directed into protected channels with appropriate low flow erosion protection and emptying into a Storm Water Management Pond prior to discharge. The channel shall be protected from receiving on-site erosion by placement of silt fencing along its perimeter.

7.11 Phasing of Construction

Runoff from the entire disturbed area on the site shall be controlled as follows:

- (a) All disturbed ground left inactive shall be stabilized by seeding, sodding, mulching or covering, or other control measure. The period of time of inactivity shall be at the discretion of the *Director* but shall not exceed 60 days or such longer period as deemed advisable at the discretion of the *Director*;
- (b) For Sites less than five (5) hectare disturbed at one time, sediment control fences and cut-off swales/channels or equivalent control measures shall be placed along all downslope boundaries of the site;
- (c) For Sites adjacent to existing residential areas, a fence and a cut-off swale/channel shall be placed around the entire perimeter of the site to prevent drainage onto private lands. A three (3) metre wide buffer strip and/or sediment control fence shall be provided along the perimeter of the downslope boundaries of the site;

8.0 POST CONSTRUCTION ESC PLAN

8.1 Standards for Stabilization and Rehabilitation

To ensure the stabilization of the Site and limit runoff Total Dissolved Solids to preconstruction levels one of the following two practices shall be implemented:

- (a) vegetative stabilization practices such as temporary seeding, sod stabilization, permanent seeding and plantation, maintenance of buffer zone; or
- (b) preservation of natural vegetation and non-vegetative stabilization practices such as mulching, geotextiles, soil-retaining measures and stream bank stabilization to be used when required to supplement natural vegetation.

8.2 Pond(s) remaining for water quality and quantity control after construction (i.e. permanent facilities) shall be restored to the satisfaction of the municipality (with as-built bottom survey) prior to assumption.

8.3 Any sedimentation or erosion damage to adjoining surfaces and watercourses resulting from the site alteration must be repaired.

9.0 MONITORING AND INSPECTION PLAN

The monitoring and inspection plan must meet the terms specified by the approval agencies. Monitoring and inspection will be conducted pre, during and post construction by a qualified site inspector.

9.1 Duties of the Site Inspector

The Site Inspector will visit the sites on a weekly basis and after each storm event to ensure that the ESC Plan implemented properly and continues to function in accordance with the original design. The Site Inspector shall provide the City with a list of any deficiencies observed during inspection, and also inform the City landowner/developer is not rectifying deficiencies immediately.

Responsibilities of the Site Inspector will include:

1. Protection of the recipient drainage systems
2. Protection of onsite environmental features
3. Maintenance of erosion and sedimentation control measures

The Site Inspector will maintain a journal during construction activities and prepare a photographic record of pre-, during, and post-construction showing that structures and works have been completed according to the approved plans.

Deficiencies will be noted and the implemented corrective measures identified and rectified immediately.

9.2 Pre-Construction

The Site Inspector will brief the Contractor and Contract Administrator of the terms and conditions of the permits issued of any sensitivity associated with the proposed works.

The Site Inspector will ensure that all erosion and sedimentation control measures are correctly installed prior to the commencement of topsoil stripping.

9.3 During Construction

1. The Site Inspector will inspect erosion and sedimentation control measures and recommend appropriate modifications/repairs as required.
2. The Site Inspector will ensure “due diligence” through adherence to all federal, provincial and local legislation and regulations.
3. The Site Inspector will respond to upsets/unforeseen circumstances and recommend corrective/preventative measures where appropriate.

9.4 Post Construction

Monitoring will be carried out at the completion of construction and in each of the subsequent two years to assess the success of the implemented erosion and sediment control plan. Timing for removal of all ESC measures will be at the discretion of the site inspector.

Where the ESC Plan utilizes the permanent stormwater management facility, that facility will require maintenance for a two year period after substantial completion of contributing catchment area. Maintenance will include, but not limited to final grading, dredging to achieve approved permanent pool and active storage volumes and finalization of landscaping plan. All works are to be monitored and inspected for compliance with the approved design drawings. Prior to the end of the two year landscaping warranty period, all plantings are to be inspected and any plants that are not showing signs of growth, replaced.

10.0 ESC CONTINGENCY PLAN

Results of the inspection and monitoring plan will identify deficiencies and the requirements for corrective action. Where breaches of the ESC Plan have occurred a contingency plan will be prepared by a senior water resources engineer in consultation with the City staff. Corrective measures will be identified and the approved plan

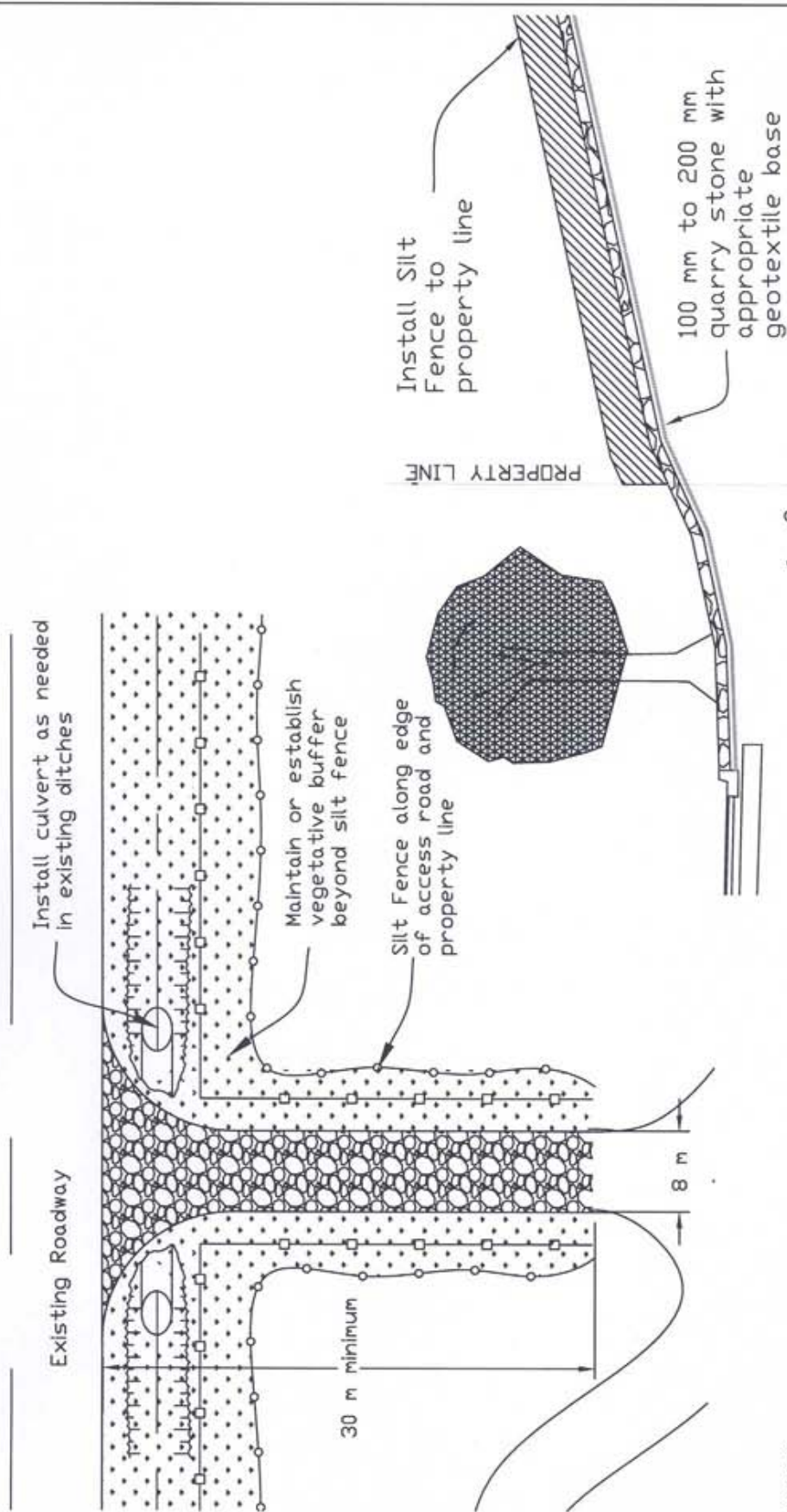
implemented immediately. Photographs of deficiencies will be taken and document for future reference.

11.0 ASSUMPTION OF PERMANENT STORMWATER MANAGEMENT PLAN

As noted in Section 7.2n, the erosion and sediment control plan may include the use of the permanent stormwater management facility that is to be constructed to address the long term erosion, quality and quantity control requirements of the proposed development. Where this approach is taken the facility is to be cleaned out, prior to assumption, to the grades as provided in the approved final design drawings. The approved landscape plan is similarly to be completed at that time. Assumption of the permanent facility is not to occur till two years after the substantial completion of the upstream development.

Appendix A

Siltation and Erosion Control Standard Drawings

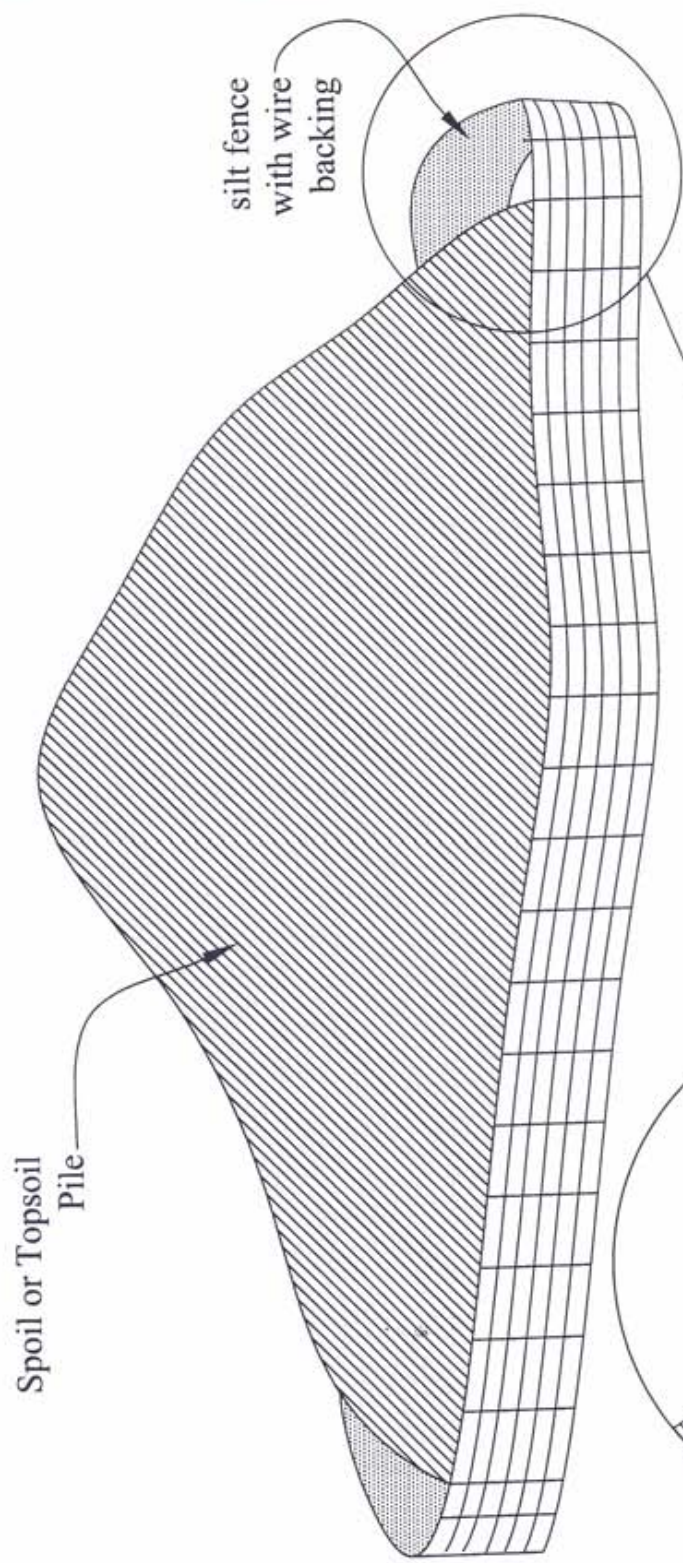


Siltation and Erosion Control Project

Construction Entrance Mat

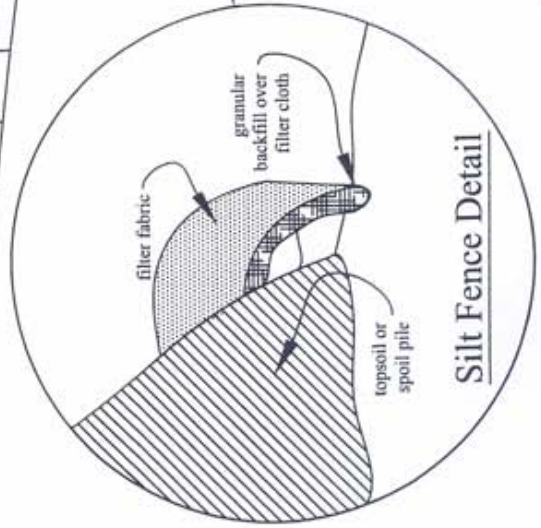
NOTES:

1. Purpose of Construction Mat is to minimize transportation of sediment onto roadways.
2. Construction mat is to be installed as the first step in the site alteration process.
3. Construction mats are required where paved roads are within 300 m of the site.



Spoil or Topsoil
Pile

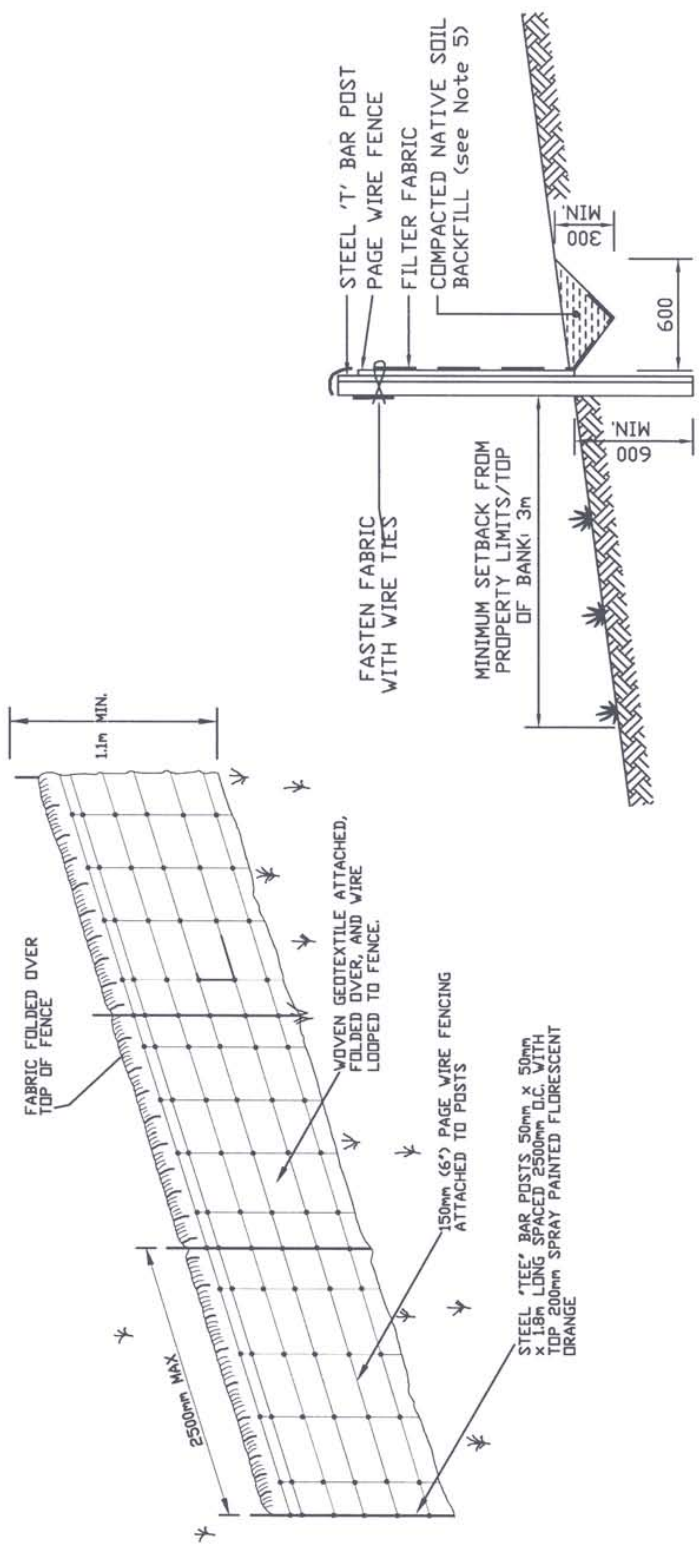
silt fence
with wire
backing



Silt Fence Detail

Siltation and Erosion Control Project

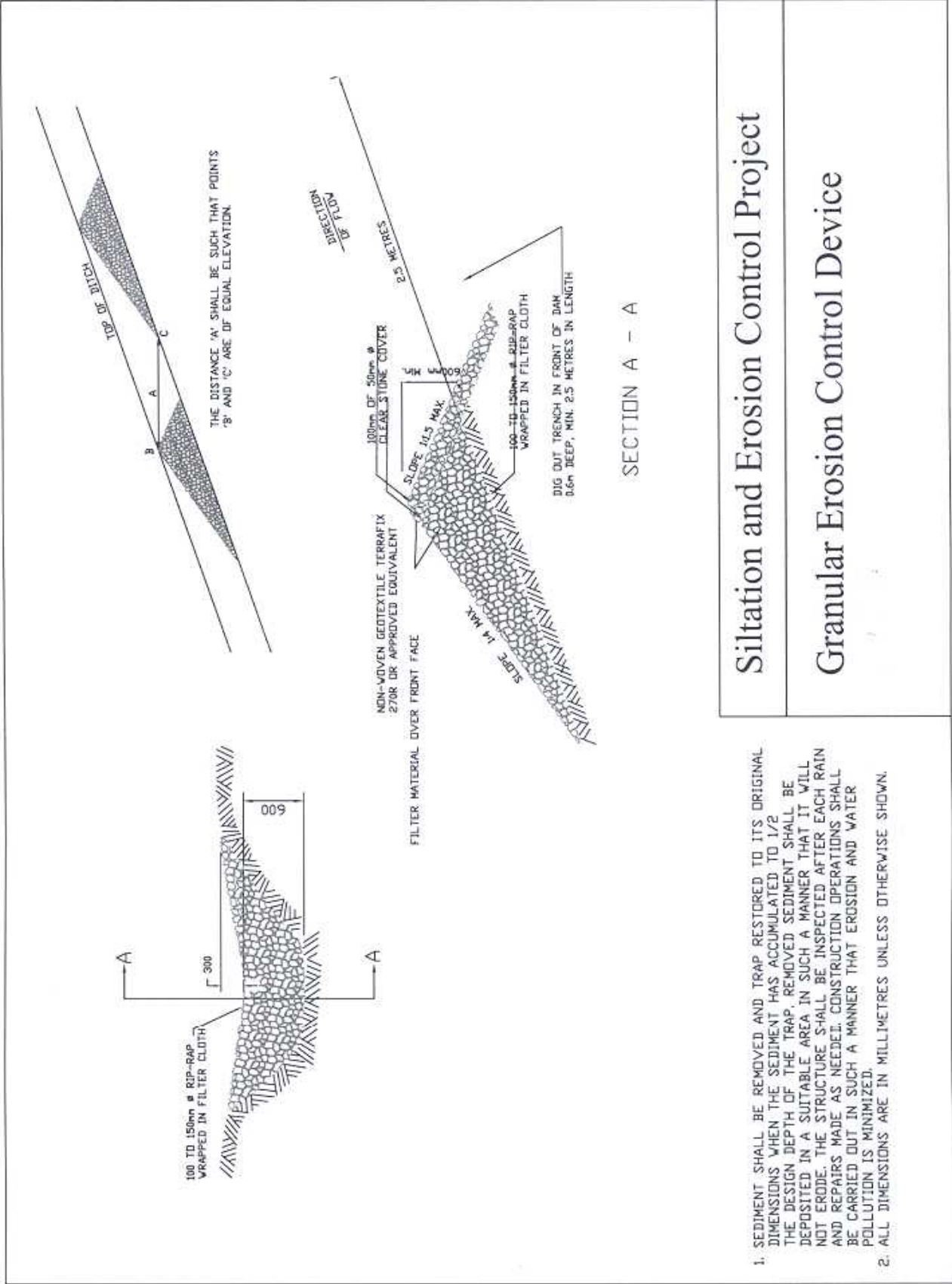
Spoil Pile Siltation Control



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

Siltation and Erosion Control Project

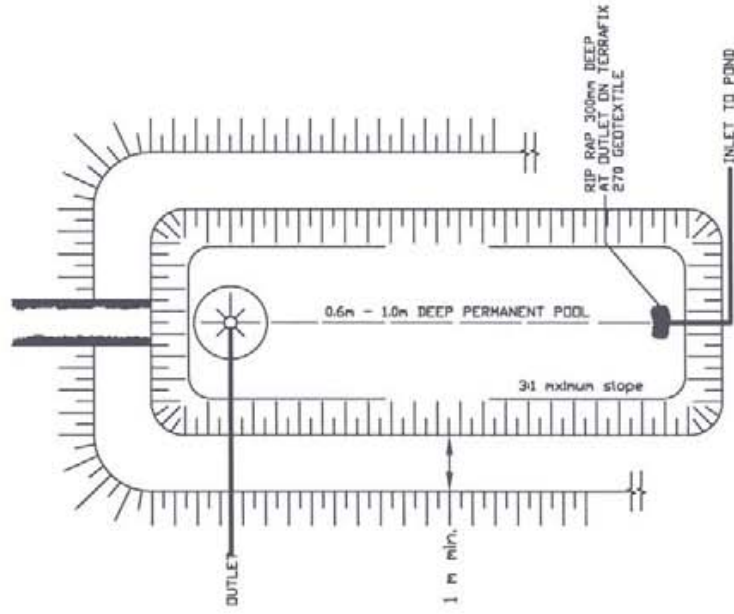
Siltation Control Fence



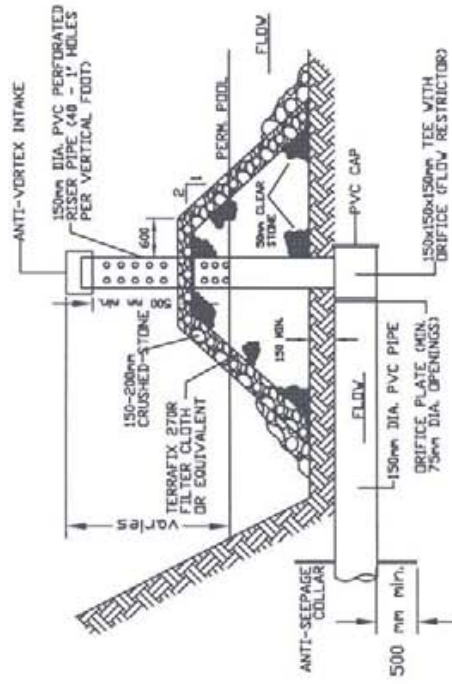
Siltation and Erosion Control Project

Granular Erosion Control Device

1. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.



PLAN VIEW



NOTES:

1. POND BERMS TO CONSTRUCTED USING IMPERVIOUS MATERIAL, COMPACTED TO 95% S.P.D, AND INSPECTED BY A PROFESSIONAL ENGINEER.
2. A 1.5m HIGH BARRIER FENCE SHALL BE ERECTED ALONG PERIMETER OF SEDIMENT BASIN. WARNING SIGNS SHALL BE ATTACHED TO THE FENCING STATING THE AREA IS OFF LIMITS TO THE GENERAL PUBLIC, AND ADVISING THAT THE BASIN IS USED FOR SEDIMENT CONTROL PURPOSES, AND THAT THE SUBJECT AREA IS SUBJECT TO FLASH FLOODING.
3. THE BASIN IS TO BE CONSTRUCTED ON THE BASIS OF A MIN. LENGTH TO WIDTH RATIO OF 4 TO 1.
4. APPROPRIATE PESTICIDE AND LAVICIDE CONTROLS SHOULD BE MAINTAINED TO CONTROL MOSQUITO BREEDING AS DIRECTED BY MEDICAL OFFICER OF HEALTH

Siltation and Erosion Control Project

Temporary Sediment Basin and Outlet Details

PART C – THE APPENDIX

STATEMENT REGARDING PUBLIC MEETING

This is to certify that pursuant to Sections 22(1) and 17 of the Planning Act R.S.O. 1990, a public meeting regarding

OFFICIAL PLAN AMENDMENT NO. 144

was held by the Municipal Council of the Corporation of the City of Brantford on

MAY 5, 2008

in Council Chambers, City Hall, Brantford and that notices of invitation to attend said meeting were issued on:

APRIL 11, 2008

In accordance with Section 2(2) of R.S.O. 1990, O.Reg. 198/96.

Dated this day of , 2008.

CITY CLERK

**CERTIFICATION OF COMPLIANCE
WITH PUBLIC INVOLVEMENT
AND
NOTICE REQUIREMENTS
REGARDING OFFICIAL PLAN AMENDMENT NO. 144**

I, Darryl Lee, City Clerk, hereby certify that the requirements for the giving of notice, and the holding of at least one public meeting as set out in Subsection 17(15) of the Planning Act, R.S.O. 1990, and the giving of notice as set out in Subsection 17(17) of the Planning Act, R.S.O. 1990, have been complied with.

**DARRYL LEE
CITY CLERK
CITY OF BRANTFORD**