SUBJECT: Development Engineering Guidelines; Sidewalk and Financial Policies for Development; and Response to Hearings Sub-Committee Outstanding Business – as at April 2, 2003 – Item AA (Sidewalks on Highvalley Road, Ancaster) (PD03060) (FCS03073) (PW03027) (City Wide)

RECOMMENDATION:

That Council adopt a comprehensive document, outlining policies and procedures for servicing requirements for new development, by rescinding in their entirety, all existing development engineering guidelines, sidewalk policies and relevant financial policies for development of the former municipalities of the new City of Hamilton, namely, the Town of Ancaster, Town of Dundas, Town of Flamborough, Township of Glanbrook, Corporation of the City of Hamilton, City of Stoney Creek and the Regional Municipality of Hamilton-Wentworth.
A) ENGINEERING GUIDELINES

i) That the Development Engineering Guidelines, dated April 1, 2003, attached to Report PD03060 as Sections 1 and 2, and the Appendices of Appendix “A”, relating to the standard engineering requirements for new development in the City of Hamilton, be accepted by Council for information. Further, that staff be directed to use these as the new City guidelines for servicing land under development applications.

ii) That the Department of Planning and Development be authorized to update the Development Engineering Guidelines, on an on-going basis, as technical initiatives and standards from other departments are completed and other design criteria developed.

iii) That, where appropriate, the City’s Manager of Development Engineering may approve exceptions to the requirements of the engineering guidelines in consultation with the Department of Public Works, where required.

B) SIDEWALK POLICIES

i) That the requirement for sidewalks in new developments, as outlined in Section 2.4.5.5 of the Development Engineering Guidelines, attached to Report PD03060 as Appendix “A”, be approved as Council policy for new developments in the City of Hamilton, which requirements are summarized as follows:

1) That sidewalks in new subdivisions shall be provided on one (1) side of all “local residential” streets except as outlined below;

   aa) That no sidewalks shall be required on cul-de-sacs (1-access street) having a maximum of thirty (30) residential units, or on crescents (street with 2 accesses to the same street) having no more than sixty (60) residential units (corner entrance lots are not included in the determination of maximum units), or on a combination of cul-de-sacs off crescents having a maximum of 110 residential units; unless the cul-de-sac or crescent design connects to a pedestrian link or walkway to external community facilities such as schools, parks/open space, other residential areas, shopping areas, or recreational areas; in which case, a sidewalk on one (1) side of the street shall be required connecting to the pedestrian link/walkway; and,

   bb) That a 1.75m boulevard shall be provided between the curb and the sidewalk.
2) That a sidewalk in new subdivisions shall be provided on both sides of all “Collector” streets with a 1.75m wide boulevard between the curb and the sidewalk.

3) That a sidewalk in new subdivisions shall be provided on both sides of all “Arterial” streets:
   
   aa) located 1.0m from the streetline, where there is no driveway access permitted to the arterial street; and,
   
   bb) which shall include a 3.0m boulevard between the curb and sidewalk where driveway access is permitted to the arterial street.

4) That there shall be no requirement for sidewalks on internal streets within industrial subdivisions.

ii) That communication be enhanced to the public and prospective purchasers related to sidewalk locations and driveway/boulevard policies in the City of Hamilton to assist in citizen’s understanding of the policies, thereby minimizing requests to vary the policies by:

1) Requiring subdividers, through the Subdivision Agreement, to clearly identify the location of all required sidewalks on the entrance billboard sign(s) displaying the new subdivision.

2) Requiring subdividers, through the Subdivision Agreement, to openly display in the site sales office/model home, the approved grading or engineering plan showing all sidewalk locations, boulevard areas and proposed street furniture locations.

3) That the City’s standard form Subdivision Agreement be amended to include the following additional provisions:

   a) That, prior to registration of the plan, the Subdivider shall erect, at each main entrance to the subdivision, a billboard sign displaying the design of the plan, zoning, proposed and surrounding land use, sidewalk locations and pedestrian connections and other special site features; with the sign contents and sign size all as firstly approved by the City’s Director of Development.

   b) That the Subdivider undertakes to place a notice in all Offers to Purchase and Sale, Rental Agreements, advising prospective purchasers and tenants that a sidewalk will or will not be constructed within the right-of-way fronting the subject property.
SUBJECT: Development Engineering Guidelines; Sidewalk and Financial Policies for Development; and Response to Hearings Sub-Committee Outstanding Business – as at April 2, 2003 - Item AA (Sidewalks on Highvalley Road, Ancaster) (PD03060) (FCS03073) (PW03027)

- Page 4 of 31

c) That the Subdivider undertakes to place a notice in all Offers to Purchase and Sale advising prospective purchasers that the driveway apron approach within the public right-of-way is required to be hard-surfaced by the owner within three (3) years of initial occupancy or use of the lands with all future maintenance of such driveway apron being the responsibility of the owner. For all single detached, semi-detached and street townhouse lots, appropriate securities shall be deposited with the City, by the Builder, at the time of the building permit to guarantee the hard surfacing of the driveway apron.

(iii) Any exemptions or changes to the standards for sidewalks shall, unless deemed to be minor by the City’s Director of Development, require Council approval as part of its consideration of the conditions for draft plan approval of new plans of subdivision or condominium.

C) FINANCIAL POLICIES FOR DEVELOPMENT

i) That, subject to the Transition Policies of Section D of Report PD03060, the provisions of Appendix “B”, attached to Report PD03060, entitled “Financial Policies for Development”, be approved as Council policy to be applied to all development applications in the City of Hamilton.

ii) That the rates as shown in Appendix “C”, attached to Report PD03060, which represent the City’s contribution towards over-sizing, based on a “Flat Rate” system, for storm and sanitary sewers, watermains and roads constructed under Subdivision Agreements, be approved for 2003.

iii) That the rates as shown in Appendix “D”, attached to Report PD03060, the sum of which represents a “Flat Rate”, referred to as the “New Roads Servicing Rate”, be used by the City as the 2003 rate for cost sharing and cost recovery of the City’s share of above ground works, namely curbs & sub-drains, sidewalks, asphalt pavement, street-lighting, catch-basins & connections, dead-end barricades and utility trenching.

iv) That the timing of payment for the City’s share of servicing costs eligible to each development shall be subject to the availability of funding approved and allocated in the City’s annual capital budget.

Any subdivider requesting payment for City cost-sharing funding shall do so, in writing to the Director of Development, prior to October 1st of each year. Such requests may apply to both completed works or imminently proposed works. Any development requiring the City share to be paid beyond the approved Capital Budget amount for that year shall require the approval of Council. Within the Council approved Capital projects for cost-sharing of subdivision infrastructure, the Director of Development may authorize funding to be paid during the year for completed eligible projects not initially allocated funds during the Capital Budget process, subject to the availability of reserved monies funded that year. In the case of works financed through
Development Charges, the subdivider may request the City to allow the subdivider to front-end the growth-related works in exchange for a credit towards future Development Charge payments.

v) That Appendix “E”, attached to Report PD03060, entitled “City to Use Its Best Efforts”, be approved for use by the City in its Standard Subdivision Agreement, as required by the Director of Development.

vi) That the cost of above ground services constructed by subdividers, adjacent to subdivision lands already owned by a school board at the time of development, be referred for consideration to the Development Co-ordinating Committee for the City’s New Development Charge By-law.

vii) That the cost of existing or future services adjacent to “reverse frontage” lots, where reverse frontage lots have been mandated by the City, and the cost of above ground services for freehold lots where direct access to existing roads is not permitted by the City, be referred for consideration to the Development Co-ordinating Committee for the City’s New Development Charge By-law.

viii) Any exceptions or changes to the financial policies set out in Appendix “B” shall, unless deemed minor by both the City’s Director of Development and Director of Budgets, require Council approval as part of the consideration of the conditions for draft plan approval of new plans of subdivision and condominiums.

D) TRANSITION POLICIES:

i) That the new Development Engineering Guidelines shall apply to all new development applications not having received final approval prior to City Council’s date of adoption of these guidelines, with the exception of consent, subdivision or condominium applications having been granted draft plan approval or consent approval more than three (3) years prior to Council’s adoption date to which current standards and policies may be applied. Where a subdivider requests a change to a previously approved subdivision, condominium or consent, the City may apply any or all of the new Engineering Guidelines and Financial Policies.

ii) That the provisions of these guidelines shall not apply to those subdivision applications where an engineering submission has been received by the City and is currently under review or approved.

iii) That the subdivider shall be permitted to choose that all of the new Development Engineering Guidelines be applied to applications having already received draft plan or consent approval and/or where engineering
submissions have been submitted and for which no Development/Subdivision Agreement has been executed.

iv) That notwithstanding (i) (iii) and (iii) above, where appropriate, the City’s Manager of Development Engineering may require updates to any approved engineering drawings or drawings currently under review with respect to materials and product specifications for conformance with the new standards.

v) That the proposed Financial Policy for Development in the City of Hamilton, attached as Appendix “B” to Report PD03060, not apply to any development applications where a Subdivision or Development Agreement has been executed or an engineering submission has been received by the City, prior to Council’s approval date of the Financial Policies.

vi) In the case of any executed Development or Subdivision Agreement that contains provisions in conflict or contrary to these guidelines or policies; the City agrees to honour the provisions of such Agreements.

vii) That, where there is a conflict between any provisions of the Financial Policy, attached as Appendix "B" and an existing Development Charges By-law of any of the former municipalities, which now make up the City of Hamilton; then the requirements under the existing Development Charge By-law shall govern and prevail the Appendix B, Financial Policies, until such By-law is repealed and replaced with the City’s New Development Charge By-law.

E) That Council maintain the City’s previously approved sidewalk requirements for Highvalley Road, Filman Road and Woodhaven Place with the exception that the requirement for Greenview Place be reduced from a sidewalk on two (2) sides to one (1) side of the street. Further, that boulevard locations for all four subject streets be reduced from 3.25 metres to 1.75 metres in accordance with the new Development Engineering Guidelines.

F) That Item AA (sidewalks on Highvalley Road, Ancaster) be removed from the Outstanding Business List as at April 2, 2003.

G) That staff be authorized and directed to amend the City’s standard form Subdivision Agreement, in a form satisfactory to the City Solicitor, by adding a clause requiring the Owner of the land at the time of building permit application to provide a $1,000 security deposit with the City, prior to Building Permit Approval, to cover repairs to damage to the adjacent curbing and sidewalk during construction. Such damage deposit shall apply only to those lots that remain vacant following completion of the surface coarse asphalt, to the satisfaction of the City’s Manager of Development Engineering.
EXECUTIVE SUMMARY:

ENGINEERING GUIDELINES/SIDEWALK POLICIES

Since amalgamation, staff has continued to apply the different engineering design criteria from each of the former municipalities. While there was a uniform standard for the installation of sanitary sewers and watermains at the Region, each Area Municipality continued to establish their own development criteria for roadways and storm sewers. The new Development Engineering Guidelines will harmonize the various design standards and sidewalk locations and implement “best practices” in the City’s approach to create a uniform standard that will be applied to new developments across City of Hamilton.

FINANCIAL POLICIES

Over-sizing of Infrastructure and Land
Under the new recommended financial policy for development, a Developer is responsible to pay the full cost of services up to and including the following sizes:

- Sanitary Sewers - 450mmØ
- Storm Sewers - 1200mmØ
- Watermains - 300mmØ
- Pavement Width - 8.0m
- Base Course Asphalt Depth - 80mm

The City shall pay the oversized portion of the service cost based on a “flat rate” system (per meter of service installed) for service sizes greater than those listed above and shall update the “flat rates” yearly using the Canadata Construction Cost Index.
In addition to over-sizing of services, over dedication of land by a developer to establish arterial and collector road allowance width shall be compensated by the City where the land dedicated by a developer is greater than 13 metres in width measured from the centerline of the ultimate road allowance to its limit. All City over-sizing costs shall be funded through Development Charges.

Front-ending of Services and “Best Efforts”
A subdivider shall pay the front end-cost of all works installed adjacent to land not owned by the front-end developer. This does not include road frontage of land conveyed to the City to satisfy the requirement for parkland under the Planning Act and storm water management ponds where the City has mandated the road frontage of the pond to be greater than 8.0 metres. The City shall pay its share of the cost of services, both above and below ground, for these situations, to be funded through the Unsubdivided Land Reserve of the Capital Budget.

Where a front-ending developer has installed works adjacent to land not owned by the front-ending developer (except for parkland and storm ponds) the City will identify the front-end works in its Subdivision Agreement under a “Best Efforts” provision. In most cases, a 0.30 metre reserve will be established by the City adjacent to the lands abutting the front-end works and the City will use its “Best Efforts” obligation under the Subdivision Agreement to recover the abutting landowner’s benefitting share of the front-end cost when the adjacent lands develop. In cases where front-ended works are adjacent to existing development, a Municipal Act by-law will be passed to assess applicable costs to each benefitting landowner. The City shall reimburse the front-end developer with the adjacent landowners share of the front-end servicing cost. All “Best Efforts” recoveries for both above and belowground works shall be based on actual construction cost of the works installed, less over-sizing. The actual cost shall be adjusted by the Canadata Construction Cost Index from the month when the works were constructed to the month a recovery is paid.

New Roads Servicing Rate (Cost Sharing and Cost Recovery by City)
All cost sharing and cost recovery by the City for road works shall be based on a “flat rate” system referred to as “The New Roads Servicing Rate”. This rate represents the average cost of local road construction under Subdivision Agreements and is composed of curbs & sub-drains, sidewalks, asphalt pavement, street-lighting, catch-basins & connections, and utility trenching.

The City shall use the New Roads Servicing Rate to pay its share of the cost of local road works installed adjacent to land conveyed for park or larger frontage stormwater management facilities, as well as recover monies previously paid by the City for road works adjacent to undeveloped lands under existing Subdivision Agreements. Each year the City shall update the New Roads Servicing Rate based on the average construction cost of local roads in the previous year.
Exemption from Cost Recovery
A developer shall pay their share of all existing or future works, which abut the lands to be subdivided by that developer. However, where the City has mandated the subdivision of land with reverse frontage single or semi-detached units; a developer shall not be required to pay for the cost of services along the rear portion of reverse frontage units. Financing for this situation may be eligible for funding through Development Charges, although it is to be considered as part of the City’s New Development Charge By-law.

Also, where the City has mandated that direct access from freehold lots is not permitted to an existing roadway, but access is to be provided by a new shared service road (or lay-by), the subdivider typically is not required to pay for existing or future above ground works along the frontage. This situation and cost funding should also be considered by the City’s Co-ordinating Committee for the new Development Charge By-law.

Financing of City Share
Recommendation C(iv) clearly identifies a process for the timing of payment by the City for any eligible City share of the cost of new development. Funding is dependent on approval of sufficient funds in each year’s Capital Budget with funds specifically allocated to projects requesting, in advance, funding required.

BACKGROUND:
On January 1, 2001, the New City of Hamilton was formed which amalgamated the former local municipalities of the Town of Ancaster, Town of Dundas, Town of Flamborough, Township of Glanbrook, Corporation of the City of Hamilton, City of Stoney Creek and the Regional Municipality of Hamilton-Wentworth.

Under the City of Hamilton, restructuring in the Planning and Development Department has combined development staff from all the former municipalities into one Division, which administers development control for the entire City of Hamilton. On October 30, 2001, Council adopted a new unified Subdivision Agreement for the purpose of servicing land with municipal infrastructure under development applications in the City. Also, on June 12, 2002, Council approved a new policy for control of grading for all single and semi-detached lots created through Planning Act applications. Development staff has now undergone a comprehensive analysis of engineering guidelines, sidewalk and financial policies existing within the former municipalities, and other municipalities, in order to unify these policies and develop appropriate standards for application across the City of Hamilton.

The Department of Planning and Development was assisted greatly by the experience and professionalism of A. J. Clarke and Associates, the City’s Consultant on the project. Funding for the project was provided by Transition Board Reserve monies.
ENGINEERING GUIDELINES

The Development Engineering Guidelines is a comprehensive document referencing standards, policies and procedures for the City of Hamilton regarding the design of “hard services” for land under development applications. Staff has examined the standards, policies and procedures of the former local municipalities, and other municipalities, in developing the new harmonized standards, policies and procedures which are considered fair and equitable to all areas of the new City, and represent what we believe, will achieve good quality development and appropriate community design.

There are a number of other new initiatives that are currently under review and, when completed, will be incorporated into the Development Engineering Guidelines. These initiatives include the development of storm drainage design criteria and other polices that will be implemented by the Public Works Department, Capital Planning and Implementation Division, Strategic Planning Section. In addition, a new Specification Manual is being prepared by Public Works, Capital Planning and Implementation Division, Design Section, which will be cross-referenced in the Development Engineering Guidelines document. Once presented to Council, the City’s new Site Plan Guidelines may also include relevant standards for appropriate inclusion into the new Development Engineering Guidelines. The Site Plan Guidelines are expected to be considered by Committee and Council in August/September 2003.

SIDEWALK POLICIES

The requirement for and location of sidewalks in new development varied across the former area municipalities. City Council, in the past, has continued to be requested to consider petitions from residents to eliminate the requirement and/or change the location of the sidewalk in the boulevard area. The establishment of a uniform sidewalk policy and improved communication of the City’s requirements will minimize and, hopefully, eliminate future requests to Council for changes to sidewalk requirements.

FINANCIAL POLICIES

Prior to amalgamation, the former local and regional municipalities dealt with the financial aspect of development using their own set of financial policies for cost sharing and cost recovery of services constructed under development agreements. Through the analysis of existing policies, it was evident that the former municipalities shared different philosophies with respect to cost sharing and cost recoveries by a municipality. For example, the former City of Hamilton was the most liberal in the area of cost sharing for services, whereas the Towns of Ancaster, Dundas, Flamborough and Glanbrook provided almost no cost sharing at all. The intent of our analysis was to re-examine the philosophies behind cost sharing and cost recoveries under development applications in order to strike a balance between the former municipalities and derive a policy, which is fair and equitable to all areas of the new City and the development industry.
ANALYSIS OF ALTERNATIVES:

ENGINEERING GUIDELINES

Submission Requirements
Section 2.4.1 of the guidelines outlines requirements for the submission of detailed engineering drawings for servicing land under development applications. Clarifying the requirements will eliminate the uncertainty experienced by new consultants and developers in the City of Hamilton and to expedite the approvals process.

Sewer Design
The design of sanitary sewers was uniformly adopted across the former City of Hamilton and local municipalities, as it was a Regional service. Section 2.4.2 documents the criteria and design standards and specifications for this utility. The guidelines do include one major change in the sanitary sewer design criteria from the previous Regional design standards; that being the average daily domestic flow factor. This factor has been reduced from 455 to 360 litres per capita per day. The reduction in the daily domestic flow factor was based on a study that was undertaken in the late 1990’s where actual flows were measured and documented. Although the reduction in the daily domestic flow factor will increase the design capacity of the sanitary sewer; the minimum sewer size will remain unchanged. A minimum sanitary sewer size of 250mm is required to facilitate maintenance and cleaning of the sewer.

The storm sewer design criteria in determining flows has varied across the different local municipalities. With the exception of the former City of Hamilton, the local municipalities calculated storm run-off using the rational formula. The City of Hamilton utilized the modified rational method. The rainfall intensity curve was unique to each individual area and the storm sewers were designed for a 5-year storm for the local municipalities. However, a fifty (50) year storm was used to size storm sewers in the former City of Hamilton.

The storm drainage policies and criteria are currently being reviewed by the City’s Public Works Department, Capital Infrastructure Planning Division, Strategic Planning Division. It is recommended that until such time the storm drainage policy review is completed, that the current design criteria for each local municipality be maintained. Section 2.4.3.4 reflects the methods of determining storm design flows in the former municipalities.

Watermain Design
Watermain design criteria were uniformly adopted across the former City of Hamilton and Area Municipalities, as it was a Regional service. The design criteria, design standards and specifications for watermains are detailed in Section 2.4.4. Developers and their Engineers are required to conform to these criteria, standards and specifications for the supply of water for their developments.
Local Road Allowance Width
After the amalgamation, various requests were received from the development industry to examine the policy respecting the minimum road allowance width for urban local residential roadways. With a few exceptions, the minimum road allowance width across the local municipalities was 20m. In response to the development industry, the City developed a reduced road allowance right of way of 18m. The adoption of an 18m road allowance is a result of a review of best practices and consultation with other City Departments and members from the Utility Co-ordinating Committee. The Township of Glanbrook and the Town of Ancaster had previously introduced an 18m road allowances for local residential streets.

It should be highlighted that the width of the travelled portion of the roadway remains unchanged at 8.0m wide, consistent with the pavement width on a 20m road allowance. At this time there is no support from staff to consider further reductions in road allowances widths.

In addition, standard right of way cross sections for the wider road allowances were reviewed and revised standards were developed. The adoption of these cross sections encourages conformity to standard locations for utilities (gas, bell, hydro, cable, water, and sewers) within the various width road allowances. The standardization of cross sections will save time and money when services must be located for repair at a later date.

Pavement Design
There were differences across the various local municipalities on the minimum pavement design for local residential streets. It varied in both the thickness of the cross section and the type of materials. The table below illustrates the differences between the local municipalities.

| Existing Pavement Design Requirements |
|-------------------------------|------------------|-----------------|------------------|------------------|------------------|
| Town of Ancaster             | Town of Dundas   | Town of Flamborough | Township Of Glanbrook | City of Hamilton | City of Stoney Creek |
| **Surface Course Asphalt**   | 40mm            | 40mm            | 40mm            | *               | 40mm            | 40mm            |
|                             | HL3             | HL3             | HL3             | HM3             | HL3             |                  |
| **Binder Course Asphalt**    | 50m             | 80mm            | 50mm            | *               | 80mm            | 85m             |
|                             | HL8             | HL8             | HL8             | HL8             | HL8             |                  |
| **Granular Bases**           | 450mm           | 150mm           | 150mm           | 150mm           | 150mm           | 150mm           |
| Granular A                   | 150mm           | 150mm           | 150mm           | 150mm           | 150mm           |                  |
| Granular B                   | 225mm           | 300mm           | 300mm           | 400mm           |                  |                  |
| Granular B                   | 300mm           | Granular B      | Granular B      |                  |                  |                  |
| Granular B                   |                  |                 |                 |                  |                  |                  |

**Note:** * minimum 75mm of asphalt, pavement design shall be in accordance with recommendations of a geotechnical consultant
The new required pavement design for local residential streets in new subdivisions consists of:

- 40mm HM3 Surface Course Asphalt
- 80mm HL8 Binder Course Asphalt
- 150mm Granular A
- 300mm Granular B, Type II (100% Crushed Aggregate)

The asphalt mixes are consistent with those mixes that are utilized in the Capital Works Program administered through the Public Works Department, Capital Planning and Implementation Division, Design and Construction Section.

**Driveway Apron Approaches**

In examining the existing requirements associated with driveway apron approaches throughout the former municipalities of the City, staff found it ranged from no requirement to the requirement of a concrete apron approach. The following table summarizes the requirements for driveway apron approaches of the former local municipalities.

<table>
<thead>
<tr>
<th>Driveway Apron Approach Requirements</th>
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<tbody>
<tr>
<td><strong>Town of Ancaster</strong></td>
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<tr>
<td><strong>Town of Dundas</strong></td>
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<tr>
<td><strong>Township of Flamborough</strong></td>
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<tr>
<td><strong>Township Of Glanbrook</strong></td>
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<tr>
<td><strong>City of Hamilton</strong></td>
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<tr>
<td><strong>City of Stoney Creek</strong></td>
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</tbody>
</table>

Stakeholders in the development industry expressed their dissatisfaction with the requirement of providing concrete apron approaches in the case where there was a sidewalk. They have indicated that many homeowners do not wish to have a concrete apron approach and have expressed a desire to have the same treatment as their driveway (i.e. Impressed concrete, asphalt, interlocking brick). In addition, they raised the issue of not treating all homeowners equitably. For those lots, which do not have a sidewalk there was no requirement for any treatment in the driveway approach.

The policy respecting apron approaches was reviewed and staff has recommended that there be no requirement from the Developer to provide for a hard surface on the apron approach. However, Recommendation B(ii)3.c requires the purchaser to be responsible for hard-surfacing the apron within three (3) years of initial occupancy and to maintain
the apron thereafter. Although no securities will be collected to “force” this requirement, the obligations of the owner will remain as an encumbrance on title of the lands.

**Asphalt Turning Circles**
After a comprehensive review of standards utilized by the former local municipalities on asphalt turning circles on cul-de-sacs, the new standard developed provides for a 13m radius asphalt turning circle. The criterion was established through input from staff responsible for the maintenance operations such as snow removal and garbage collection, as well as through discussions with members from the Hamilton-Halton Homebuilders Association at the liaison committee meetings. The minimum 13m radius was established during a field demonstration with various pieces of maintenance equipment (snow equipment, waste collection, etc). It was determined that this minimum was required to allow maintenance vehicles to completely turn around at dead ends (cul-de-sacs) without the need to operate the equipment in reverse.

<table>
<thead>
<tr>
<th>Town</th>
<th>Asphalt Turning Circles in Cul-de-sacs</th>
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</thead>
<tbody>
<tr>
<td>Town of Ancaster</td>
<td>Minimum 10.5m radius asphalt turning circle (15m radius road allowance)</td>
</tr>
<tr>
<td>Town of Dundas</td>
<td>Minimum 13m radius asphalt turning circle (18.75m radius road allowance)</td>
</tr>
<tr>
<td>Township of Flamborough</td>
<td>Minimum 13m radius asphalt turning circle (18.75m radius road allowance)</td>
</tr>
<tr>
<td>Township Of Glanbrook</td>
<td>Minimum 13m radius asphalt turning circle (18.75m radius road allowance)</td>
</tr>
<tr>
<td>City of Hamilton</td>
<td>Minimum 9m radius asphalt turning circle (14.75m radius road allowance)</td>
</tr>
<tr>
<td>City of Stoney Creek</td>
<td>Minimum 15.25m radius asphalt turning circle (21.0m radius road allowance)</td>
</tr>
</tbody>
</table>

**Street Trees**
Street tree requirements are outlined in Section 2.4.5.15. The Developer is required to provide for a minimum of one street tree along the frontage for each residential lot and two (2) additional trees on the flankage side on corner lots. This requirement is essentially the standard among all the former local municipalities. The selection and mix of species for boulevard trees are to be approved by the City’s Manager of Forestry in accordance with the City’s standard list of tree species for boulevards.

**Park Development**
Section 2.4.5.18, “Parklands”, defines the subdivider’s responsibilities when parklands are within the plan of subdivision and to be dedicated to the City. The subdivider’s responsibilities are limited to grading and seeding of the parklands and provisions for sewer and water service connections. Other amenities and site treatment, including landscaping, trails, recreation equipment, etc., are the responsibility of the City.
Servicing Land Prior to Plan Registration

Prior to amalgamation, there existed time lags in the process for Subdivision Agreement preparation and execution, which delayed servicing of land under development applications. Construction of services under development applications could not take place until a Subdivision Agreement was prepared and signed by the developer. However, the agreement could not be signed until the municipality had received approval from its Council to enter into the agreement and expend municipal monies where there was cost sharing by the municipality. During typical summer months, Council would reduce its schedule of meetings, which made the time lags longer and more difficult to work within for development staff. As a result, subdividers became increasingly frustrated because servicing was frequently delayed during the ideal months of the year for construction.

Most local municipalities introduced a Pre-servicing Agreement as a solution to the time lag problem surrounding Council meetings. The agreement allowed a developer to proceed with construction of their development prior to Council approval to execute a Subdivision Agreement, provided the developer's engineering design was approved and other requirements related to servicing land were completed.

As a result of amalgamation, the development approval process was re-examined and initiatives were undertaken to streamline the process. From these initiatives staff obtained delegated authority from Council on August 22, 2001 to execute Subdivision Agreements where the requirement to enter into a Subdivision Agreement was a condition of development approval. The rational for such authority was that the requirement to enter into a Subdivision Agreement was previously approved as part of the draft approval stage for the development. It was determined that the act of fulfilling the direction of Council, or the authority delegated by Council, from an earlier stage of the development process did not require further Council approval at a later stage in the development process. Thus, the current process allows the City to execute Subdivision Agreements without further Council approval provided it is a condition of development that the Developer enter into an agreement with the City.

Due to this streamlining measure, it is the opinion of staff that the current process now eliminates the need to allow developers to pre-service land prior to execution of a Subdivision Agreement. Therefore, it is the recommendation of staff no land be serviced under a development application until a Developer:

i) has signed a Subdivision Agreement and has submitted all financial securities for such servicing required by the Agreement; and,

ii) has received approvals from all applicable agencies for servicing; and,

iii) has satisfied all conditions of draft plan approval, which must be completed prior to commencing the construction of services.
To ensure that the City’s engineering approval and Subdivision Agreement process is maintained, Development Staff has made a commitment to the Development industry to have a completed Subdivision Agreement ready for execution by the developer within three (3) weeks of final approval of the engineering design drawings. Where the City is unable to fulfil this commitment, due to a delay on the part of the City, then to avoid any unnecessary delays to the developer, the Director of Development will permit servicing prior to Subdivision Agreement execution subject to the current practice of entering into a Pre-servicing Agreement with a $50,000 security deposit.

**Easements**
The City’s Public Works Department, Water and Wastewater Division, Operation Planning Section recommended minimum easement widths for the various sewer and watermain installations. The minimum width takes into consideration difficulties encountered in the past when it was necessary to perform works within the easement.

The width established ensures sufficient space for equipment to manoeuvre within the limits of the easement. It should be noted that easement widths may be increased should soils condition, topography, operational needs and/or depth of the utility be identified as a potential problem. The industry stakeholders have raised concerns and feel that the widths are excessive, particularly those required for sewers and watermains. Exceptions may be considered during pre-engineering submissions for requests to reduce easement width, should circumstances warrant. Consideration of such requests will be given by both the Development Engineering Division and Department of Public Works.

Development Engineering easements required for sewer mains, storm outlets or watermains shall be in accordance with the following guidelines:

<table>
<thead>
<tr>
<th>Minimum Easement Widths</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>One sewer</td>
<td>9m</td>
</tr>
<tr>
<td>Dual Sewers</td>
<td>12m</td>
</tr>
<tr>
<td>Watermain</td>
<td>6m</td>
</tr>
<tr>
<td>One Sewer and Watermain</td>
<td>10m</td>
</tr>
<tr>
<td>Dual Sewers and Watermain</td>
<td>12m</td>
</tr>
</tbody>
</table>

As an overall principle, the City discourages the use of any easements in new development where other feasible alternatives exist.
Lot Grading
Section 2.5 incorporates the lot grading policy that was approved by City Council on June 12, 2002 for single family and semi-detached lots in new developments. The policy establishes the design criteria and standards for the control of grading of single and semi-detached lots in new developments.

SIDEWALK POLICIES

Council has been increasingly asked to deal with requests to eliminate the requirement of sidewalks in new developments. In the absence of a uniform sidewalk policy, establishing criteria for the requirement of sidewalks and the location of sidewalks in relation to the curb and gutter, Council had little direction on how to deal with requests with decisions becoming inconsistent.

The following chart summarizes sidewalk location requirements from the former local municipalities within the City.

<table>
<thead>
<tr>
<th>Municipalities</th>
<th>Sidewalk Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancaster</td>
<td>Sidewalks on both sides of arterial and major collector roads. Sidewalks on one side of minor collector roads. No sidewalk requirement for local roads.</td>
</tr>
<tr>
<td>Dundas</td>
<td>Sidewalks on both sides of arterial, collector, and local roads. No sidewalks required on cul-de-sacs where the number of residential units is fifteen (15) or less except when the cul-de-sac connects to a walkway, or is a pedestrian link to a park, plaza, or school, then sidewalks required on one side.</td>
</tr>
<tr>
<td>Flamborough</td>
<td>Sidewalks on both sides of arterial, collector, and local roads.</td>
</tr>
<tr>
<td>Glanbrook</td>
<td>Sidewalks on both sides of arterial and collector roads. Sidewalks on one side of local roads.</td>
</tr>
<tr>
<td>Hamilton</td>
<td>Sidewalks on both sides of arterial, collector, and local roads. No sidewalk required on cul-de-sacs and crescents where the number of residential units is thirty (30) or less except when the cul-de-sac or crescent connects to a walkway, or is a pedestrian link to a park, plaza, or school, then sidewalks required on one side.</td>
</tr>
<tr>
<td>Stoney Creek</td>
<td>Sidewalks on both sides of arterial and collector roads. Sidewalks on one side of local roads.</td>
</tr>
</tbody>
</table>

It is evident that there is a need to establish sound and consistent policies to assist Council in determining the location requirements for sidewalks in new developments. Members of Council have expressed the desire to provide for sidewalks along most streets in new subdivisions in order to promote safe pedestrian access in the neighbourhood.
The recommended sidewalk policy requires sidewalks on both sides of all arterial and collector roads and one side of all local roads. The only exceptions to these requirements are for what are considered “minor local streets”. These streets include only cul-de-sacs (one-access street) or a crescent (two access to the same street) where no sidewalks are required if the number of units are below the maximum set out in the policy. The maximum number of units for a cul-de-sac with no sidewalk is thirty (30); crescents sixty (60); a combination of cul-de-sacs/crescents may have up to one hundred and ten (110) units. Any connection of a walkway or pedestrian link to, for example, schools, parks, open space, other residential areas will require the developer to install a sidewalk on one (1) side connecting with the pedestrian link. The recommended maximum number of units was developed and used by the City of Kitchener for over twenty years and relates to the level of pedestrian safety between parked cars and traffic projected. External traffic using these types of defined streets as a short cut, adding to the traffic counts, is minimized.

After reviewing the sidewalks design requirements among the various former municipalities, other municipalities, and input from various Departments in the City of Hamilton, standard roadway cross sections also were developed for local, collector and arterial roadways. Each cross section details the width of the carriageway (roadway), sidewalk locations, and locations for street furniture such as fire hydrants, hydro transformers, utility boxes, and street trees. The cross sections provide for sidewalks with a boulevard to provide a safety separation from the motor vehicles as well as location for surface and underground utilities.

There are many benefits in providing a boulevard between the curb and sidewalk. The boulevard provides an area for snow storage during the winter season, which allows for more efficient snow clearing operations. The boulevard also provides an area for the storage of solid waste or recycling containers temporarily stored at curb side for scheduled pick up so there is less tendency for them to be in the middle of the sidewalk to impede pedestrians, particularly those with strollers or in wheelchairs/scooters on the sidewalk. The boulevard provides an additional level of safety by increasing the separation between pedestrians and vehicular traffic. Pedestrians are also less likely to be splashed by passing vehicles in wet weather. The boulevard space provides space for both surface and underground utilities. Inclusion of a boulevard also provides an area where the sloped driveway approach can be positioned thereby eliminating the situation where the approach is located within the sidewalk resulting in an unsafe slope to the sidewalk. Aesthetically, the boulevard is more appealing since it breaks up the area of concrete and asphalt with a green area. The sidewalk policy is the result of a review of best practices and the input of various Departments in the City.

The other matter related to addressing past issues with sidewalks is ineffective communication to, and awareness by, the public and, most importantly, by prospective purchasers regarding the City’s sidewalk requirements. Confusion, and lack of knowledge and understanding, does exist with the general public. As part of working towards enhancing communication and awareness to the public, various
recommendations have been included in this report, including detailed, entrance billboard signs, appropriate plans required to be displayed in sales offices, and notices of sidewalk locations included in all Offers to Purchase and Sale, Rental Agreements.

Outstanding Business Item AA of the
Hearing Sub-Committee Meeting Number 03-012
Sidewalks on Highvalley Road, Ancaster and in New Subdivisions in General

The required design for sidewalks in Parkgate Estates, Greenview Estates and Falling Brook Estates was consistent with the sidewalk policy at the time these developments were proceeding to approval by the local municipality. It was always looked at as important to provide a pedestrian link between the subdivision and the access to the neighbourhood park and Bruce Trail. (See Appendix “G”)

The original approved design requirement is generally consistent with the proposed new recommendations for sidewalks. Therefore, it is recommended that the sidewalks on Filman Road, Highvalley Road, Greenview Drive and Woodhaven Place be installed in accordance with the original design with the following modifications, consistent with the new sidewalk policy.

Firstly, the sidewalks in this development area were originally designed at a location consistent with the former Ancaster municipal standards, i.e. a 3.25 metre wide boulevard. The above ground utilities were installed accordingly. The proposed sidewalks may now be installed with a 1.75 metre wide boulevard. For the most part, the location of above ground utilities in the field do not present a conflict.

Secondly, sidewalks were originally proposed for installation on both sides of Greenview Drive. In keeping with the new policy for local roads, it is recommended that a sidewalk be installed on one side of the road only. Staff suggests that since there are no above ground utility conflicts on the east side of the road, the sidewalk be installed here at the new recommended location within the boulevard.

FINANCIAL POLICIES

Over-sizing Of Infrastructure
Over-sizing of infrastructure refers to the “growth related” portion of sewers, watermains or roadways when their size is increased (over-sized) beyond the size of a local service to benefit an area over and above any single development. The purpose of the over-sizing policy is firstly: to identify the size where a service is no longer “local” in nature but has a “growth related” component which is benefiting a larger area, and secondly: to affix a rate to the growth related component of each oversized service. The City will use this rate to pay its contribution towards oversized services constructed under Subdivision Agreements.
It was agreed by all staff and stakeholders that a unified over-sizing policy for infrastructure was appropriate, would be easier to administer by the City and ultimately, would coincide with a unified Development Charges By-law for the new City. A municipality’s Development Charges By-law and the Development Charge itself are based on the “growth related” portion (oversized limit) of infrastructure established by the municipality. Hence, all over-sizing costs for infrastructure in new development is ultimately to be funded from the Development Charge Reserve.

Over-sizing limits for sanitary sewers (all pipe sizes greater than 450mmØ) and watermains (all pipe sizes greater than 300mmØ) are already standardized across the new City as the former Hamilton-Wentworth Region controlled these services over all the former local municipalities. These oversized limits can be brought forward unchanged into the City’s new guidelines without affecting existing Development Charge By-laws and have been applied to new development since 1991.

However, each former local municipality within the new City administered storm sewers and roads individually and each had its own unique Development Charge By-law based on different limits for “growth related” services. These By-laws are still in effect and will continue to be valid until replaced by a new development charges By-law in 2004. The table below illustrates the differences between local municipalities with respect to these services.

| Existing Over-size Limits of Former Local Municipalities Funded from Development Charges |
|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
| Storm Sewer | Town of Ancaster | Town of Dundas | Town of Flamborough | Township Of Glanbrook | Corporation of the City of Hamilton | City of Stoney Creek |
| Storm Sewer | Over 1050Ø | None | None | Over 1200Ø | Over 1200Ø | Over 1050Ø |
| Roads (Extra Width of Asphalt) | None | None | None | None | Over 8.0 m | Over 8.0m |
| Roads (Extra Depth) | None | None | None | None | Extra 50mm Base Course | Extra 50mm Base Course |
| Over-contribution of Land for Roads | None | None | None | None | Yes | None |

In the area of road over-sizing it was agreed by all that a road of 8.0 metre pavement width is generally recognized as an industry standard for a local residential street and that any pavement width exceeding this threshold and requiring additional base course asphalt is intended to service higher traffic volumes and benefit a larger area beyond the properties which front the road. Therefore, staff propose that road pavement width over 8.0 metres and a base course asphalt depth greater than 80mm be considered as over-sized roads by the new policy and funded from Development Charges.
For those local municipalities, which have a storm sewer, over-sizing policy, there existed a difference in policy of one pipe size (difference between 1050mmØ and 1200mmØ). Again, it was agreed by all, that based on current storm sewer design criteria, which requires larger size pipes to accommodate peak flows from a higher “Year” storm average, which storms are of higher intensity, the larger size pipe of 1200mmØ was a more appropriate choice. It should be noted that City Public Works Department is undertaking a study of Storm Sewer Design Criteria for the City of Hamilton. From this study, new design criteria may have an effect on the over-sizing limit currently set for storm sewers.

The most difficult issue to deal with regarding over-sizing policies was implementing a unified policy prior to adoption of a new City Development Charges By-law. To bridge the gap in time between adoption of the financial policy and approval of a new Development Charges By-law, two (2) options were considered.

Option 1 - Write an amending By-law to the existing Development Charges By-laws of the local municipalities adopting the new oversize limits of the financial policy.

Option 2 - Recognize the fact that until a new Development Charge By-law is approved there will be a temporary discrepancy between the financial policy and the existing Development Charge By-laws and allow a transitional period whereby the City shall pay over-sizing of infrastructure based on the limits for over-sizing set by the existing By-laws in effect.

Implementation of Option 1 would have an effect on the Development Charge Rate already in place in the areas of the former local municipalities and would result in a number of area specific charges within the new City and would be costly to implement. Option 2 imposes no additional costs to the City to implement and does not affect present Development Charge rates. Staff of Finance, Legal and Development agreed that Option 2 was the most desirable and could be implemented by way of Council resolution only.

Payment of the City’s share of over-sizing cost for roads, sewers and watermains constructed under Subdivision Agreements shall be based on a “flat rate” system (dollars/metre of service). The City shall assess a rate for each service size that is identified as over-sized, which rate represents the average of the actual cost of the oversized portion of the service. The City shall adjust the over-sizing rates attached to this report as Appendix “C” each year using the Canadata Construction Index.

A “flat rate” system based on an average of the actual cost of services is preferred over payment of over-sizing based on the actual cost by both the municipality and the development community. A “flat rate” system offers a municipality the ability to easily project what its financial commitments for over-sizing will be on a year to year basis. A “flat rate” system also significantly reduces the preparation time of the City Subdivision
Agreement because the City’s financial commitment to a project cost can be calculated quickly by multiplying the length of oversized service by its flat rate. To the developer, there is an advantage because they too can easily determine, early in the process, how much financing the City must commit to a project.

**Over-dedication of Land for Road Allowance**

Under the Planning Act, the City has authority to require a Developer to dedicate land for roads within their plan to the City with no compensation to the City. Generally, a municipality’s Official Plan defines ultimate road allowance widths for roads. Land dedication for roads within a development plan are then based on these pre-established widths.

Where a Developer is required to dedicate land to the City to establish major collector or arterial roads, which roads are intended to service the travelling public for larger areas of the City, then the land dedication exceeds that required for a local service.

In reviewing land dedications for roads, staff considered the option of no compensation for all land dedications or compensation for land dedications beyond the width required for a local service within a plan of subdivision. After considering the two (2) options, the recommendation of staff is that dedications of land by a developer beyond the width of a mid-block collector road (26 metres) is for the purpose of establishing a growth related service and should be funded by all development through Development Charges. Compensation by the City for over dedication of land to establish road allowance width for a growth related service is reasonable and consistent with the City’s policy for over-sizing of infrastructure.

**Cost Recovery for Existing Sewers and Watermains Installed Under the Local Improvement Act**

In the past, sewers and watermains were installed by the former Regional Municipality of Hamilton-Wentworth within the existing public road allowance under the Local Improvement Act. The Region assessed those properties abutting the Local Improvement works based on a Local Improvement Rate approved in the year a project was constructed. In most cases the assessed Local Improvement Rate did not represent the full cost of the project after oversizing cost was deducted. Thus each project included a non-rated component which was paid by the former Region.

Historically, recovery of the non-rated portion of a project cost occurred in one of two ways. Firstly, where the non-rated portion of the project cost has been identified as a Development Charge capital project cost, the recovery occurred indirectly through payment of the municipal Development Charge. Secondly, where the non-rated portion of the project cost had not been identified as a Development Charge capital project cost, the Region recovered this portion as a condition of Plan of Subdivision or Consent approval when the abutting land derived benefit from the existing service. This non-rated portion of a project cost was generally referred to as the “Subdivider’s Share” of the cost.
In formulating the new financial policies, staff considered the option of continuing with the policy of the former Region to recover the Subdivider’s Share of existing sewer and watermain projects or discontinue the recovery. The philosophy for such recoveries was based on the principle that development of land abutting roads with existing works installed under the Local Improvement Act resulted in somewhat lower costs to a developer as compared to the cost of servicing newly created roads within a plan of subdivision. Thus, an inequity existed between the two situations. The purpose of the policy was to eliminate this inequity. As the philosophy of the existing cost recovery policy is still applicable today, it is the opinion of staff that the existing policy be carried forward into the City’s new Financial Policy for development. Therefore, it is being recommended that the non-rated portion of a Local Improvement Project cost, referred to as the “Subdivider’s Share”, be collected by the City as a condition of Subdivision or Consent approval where such outstanding project costs apply to lands abutting and benefitting from the service.

The City shall adjust the “Subdivider’s Share” of the project cost by the Canadata Cost Index from the month when the works were constructed to the month when the cost recovery is due. Payment of the adjusted amount shall be made to the City prior to final approval of a Subdivision or Consent application.

**Cost Sharing for Frontage and “Best Efforts”**

The term “cost sharing for frontage” is intended to describe financial contribution by the City for the cost of municipal services installed by a front-ending developer along the frontage of lands, which are not owned by the front-ending developer.

The local municipalities outside old Hamilton, as well as the regional municipality, had either no cost sharing policies or, in the case of Stoney Creek, cost sharing only where services were constructed adjacent to park lands. Conversely, the former Corporation of the City of Hamilton participated more actively and extensively in cost sharing for services adjacent to lands not owned by a developer. The table below shows the level of participation in cost sharing by the former local and regional municipalities.

<table>
<thead>
<tr>
<th>Cost Sharing for Frontage Policies of the Former Local Municipalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Ancaster</td>
</tr>
<tr>
<td>Services Adjacent to Parks</td>
</tr>
<tr>
<td>Services Adjacent to private lands</td>
</tr>
</tbody>
</table>
Again, it was agreed by all that a unified cost sharing policy throughout the entire City was the most desirable. Staff considered three options:

Option 1 - That the City cost share with a developer for the cost of services along the frontage of land not owned by a developer. The City shall place a 0.30 metre reserve along the frontage of the adjacent lands and recover the City’s share of the servicing costs when the adjacent lands develop.

Option 2 - That there be no cost sharing by the City for services along the frontage of land not owned by a front-ending developer and that the developer must arrange their own method of cost recovery from the adjacent land owner.

Option 3 - That a front-ending developer pays the full up-front cost of services (less over-sizing) installed adjacent to land not owned by the front-ending developer. The City shall place a 0.3 metre reserve along the frontage of the abutting lands and will enter into a “Best Efforts” obligation under its Subdivision Agreement with the front-ending developer to recover the cost of front-end services from an abutting landowner when the adjacent lands develop.

In addition, the City will cost share with a front-ending developer for services installed adjacent to:

i) land that has been conveyed, or, is to be conveyed to the City to satisfy the requirement for parkland under the Planning Act. The City’s share of servicing cost to be paid following the completion of the works.

ii) the frontage of a storm water management pond, which is greater than 8.0 metres when the requirement for additional frontage beyond 8.0 metres is mandated by the City.

iii) vacant land owned by the City, which lands do not include undevelopable lands such as Environmentally Sensitive, open space lands, woodlands, creeks and other hazard lands. The City’s share of servicing cost shall be paid upon development of the vacant lands or when the vacant lands take direct benefit of the service (i.e. connect to underground services).
iv) lands currently owned and used by the City for its operation such as arenas, community centres, firehalls and works yards. The City’s share of servicing cost for road works shall be paid following the completion of the road works. The City share of underground works shall be paid at the time the lands take direct benefit of the service.

In considering Option 1 staff had to recognize the fact that cost sharing by the City along frontages not owned by a front-ending developer requires the City to upfront the cost and to carry the cost of those services for an indefinite period of time. These monies cannot be recovered until the abutting lands develop and in some cases the abutting lands may never develop. This form of cost sharing policy exposes the City to substantial financial liability because the unrecovered money expended by the City increases each year. In 1998 staff compiled an inventory of all monies expended by the old City of Hamilton in cost sharing which was not recovered at that time. The outstanding amount was approximately $1.2M.

Also, although the policy of Option 1 helps to promote development by relieving a developer’s financial burden associated with servicing land, it also forces the City to accept all the financial risk associated with front-end servicing for every development. In the opinion of staff, development should be at the financial risk of a developer, not the City. Also, the financial burden associated with servicing land should be spread among all front-ending developers and not absorbed by the City. For these reasons Option 1 is not practical from a financial point of view.

Option 2 addresses the liability issue associated with Option 1 but raises two other concerns. Firstly, Option 2 does not take into consideration that there are instances where the City itself is an abutting landowner and derives benefit from the services constructed by a front-end developer. Such constructed works either provides service to the land which brings a benefit to the community, such as parks; or benefits land which the City currently uses for its operation as a municipality, such as public works yards or arenas; or creates the potential for development by servicing vacant land owned by the City. Option 2 also does not take into consideration requirements and standards of the City which can require a developer to replace road frontage originally proposed for building lots with road frontage for storm water management facilities. Such situations require developers to construct services that derive no direct benefit to the developer but which are a benefit to the community in general.

The second issue with Option 2 is the responsibility placed on the front-ending developer to arrange their own method of cost recovery from an adjacent landowner for the cost of the front-end services. This type of policy can lead to developers who inflate the actual cost of services to be recovered by an abutting landowner or abutting landowners that refuse to pay their share of the front-end services. The result is disputes between landowners and developers because there is no “neutral body” involved in the process to oversee the actual cost of front-end services and control their recovery.
Option 3 addresses concerns identified in both Options 1 and 2 by eliminating the City’s financial risk associated with cost sharing for services and uses the City as a neutral body to ensure all land owners abutting front-end works will pay their benefitting share of works through a “Best Efforts” obligation in the Subdivision Agreement at the time their lands develop. In addition, Option 3 also recognizes the fact that, in some instances, the City is an abutting land owner whose land derives benefit from the front-end services installed. Option 3 identifies timing of payment of the City’s share of construction to coincide with the benefit of the works by the City. In the opinion of staff, Option 3 is most reasonable because it places the financial risk of development with the developer, uses the City as a neutral body to control cost recovery of front-end works and recognizes the fact that the City can be a landowner who also derives benefit from front-end services and who shall pay it’s benefitting share accordingly.

**Method of Cost Sharing and Cost Recovery By the City**

In formulating cost sharing and cost recovery policies for the City’s share of local services, it was necessary for staff to consider what method of cost sharing and recovery would be most appropriate taking into consideration the type of service constructed and the length of time for construction.

Construction of sewers and watermains can begin and end within the same construction season and the actual cost of the service is known within a relatively short period of time. Also, because the size of sewers and watermains and the soil conditions in which they are constructed varies widely from project to project a “flat rate” system would not represent a true average due to these inconsistencies. For these reasons, cost sharing and recovery of the City’s share of the local component of the sewer and water works based on actual construction costs makes more sense and ensures that the City never overpays or under recovers on its share of these works.

However, construction of road works is quite different from sewer and watermains. The components of a local road with standard cross section remain consistent for each development. A “flat rate” system for road works is a true and accurate representation of the average cost to construct a road because the size for each component never changes. In addition, the length of time to construct a road from start to finish can take at least two and in most cases three or more construction seasons in order to account for factors such as road settlement and rate of house construction. In the period of time between beginning and end of road construction, development of abutting lands usually occurs. As a condition of development, the abutting lands must pay their share of the road cost to the City prior to final approval of the development application. Without a “flat rate” system it would be impossible for the City to make a recovery for works, which have not been completed and final costs are not known. For these reasons, a “flat rate” system for cost sharing and cost recovery of the City’s share of road works is the most appropriate approach.

The City shall establish a “flat rate” for above ground works, which include curbs & sub-drains, catch basins & connections, sidewalks, finished road, street lighting and utility
trenching. This rate shall represent an average of the actual cost of construction of above ground works installed under Subdivision Agreements and shall be referred to as “The New Roads Servicing Rate”. The New Roads Servicing Rate shall be used to pay the City's share of road works adjacent to lands dedicated for park and road frontage of storm water management ponds over 8.0 metres, if required by the City. In addition, the City will also use this rate to recover its share of above ground works under existing Subdivision Agreements by multiplying the rate by the applicable property frontage. Each year the City shall update The New Roads Servicing Rate based on the average cost of aboveground work constructed under Subdivision Agreements in the previous year.

**Best Efforts Cost Recovery**

The City, pursuant to subsection 51(25) of the *Planning Act*, may impose as a condition of approval to a plan of subdivision a requirement to construct services outside the actual plan of subdivision but relate to the plan of subdivision. The condition must be deemed to be reasonable and has regard to the nature of the proposed development.

Further, the City has the authority pursuant to subsection 51(25) of the *Planning Act* and permitted by section 59 of the *Development Charges Act* to impose a condition of development to require subsequent developing landowners to reimburse in whole or in part, original front-ending developers for services paid for or installed, constructed or provided that benefit these landowners.

The inclusion of a "Best Efforts - Cost Recovery" clause (attached as Appendix E herein) in the "Specific Provisions" of Schedule "D" of the standard subdivision agreement for those subdivisions which require such condition for front-end services (defined as Improvements), will permit the City on a best efforts basis, to recover on behalf of the front-end developer, the proportionate costs of these Improvements from subsequent developing landowners which benefit from the Improvements. The Department of Planning and Development, in consultation with Legal staff, are recommending a new policy that the City’s obligations with respect to cost recovery on behalf of the front-end developer be limited to a maximum of ten (10) years. In the past the Ontario Municipal Board has supported a municipality being involved in cost recovery practices to repay the private sector. The Ontario Municipal Board has commented that “the sharing of costs for common elements represents an acceptable, desirable and organized way of developing.”

**Cost of Services Adjacent to Lands Owned by a School Board**

In the former City of Hamilton, both the Public and Separate School Boards own vacant lands which were intended for development as school sites by the City's various secondary or neighbourhood plans. Development of the School Boards' lands always followed development of the surrounding residential lands and, from time to time, developers found themselves in the situation of constructing services along the frontage of vacant land owned by the School Board.
Using the former City of Hamilton’s cost-sharing policy, the City paid the cost of above ground works installed under subdivision agreements adjacent to vacant School Board lands. The former Region of Hamilton-Wentworth administered installation of underground works in new developments and had no cost sharing policy with respect to School Board lands. Thus, front-ending developers paid the full cost to install underground works adjacent to School Board lands with the expectation of a cost recovery in the future, through “Best Efforts”, when the school board lands developed. It should be noted that the above situations do not apply to lands within a plan of subdivision designated as future school sites. The cost of services adjacent to these designated blocks in a subdivision plan should be paid in full, less over-sizing, by the developer, who in turn can recover the applicable servicing cost from a school board through sale of the designated site.

In considering the cost to a developer to install services along the frontage of lands owned by a school, it was agreed that these services do not benefit just the developer, but are a benefit to the community overall because they provide service to a public facility. New residential development creates a demand for additional community-wide facilities and engineering services to support those facilities. Accordingly, it is staff’s opinion that the cost for such services should be funded by all of development through the Development Charge. It is, therefore, recommended that the Development Coordinating Committee consider the cost of engineering services installed adjacent to lands presently owned by a School Board as eligible development charge funding.

Exemption from Cost Recovery
Typically, a Developer must pay its share of outstanding servicing costs for existing works in the streets, which abut their development plan. The rational for such charges to a developer is that the subdivided land fronts onto and derives benefit from the existing works and therefore it is reasonable that a Developer pay its share of the cost of those works. In some cases, subdivision of land results in creation of lots whereby the rear portion of the lot abuts a road. Such lots are generally referred to as “reverse frontage” lots.

The issue surrounding reverse frontage lots has always been that a developer is burdened with servicing costs in the road along the rear of the lot, which they derive no benefit from, in addition to typical servicing costs for the road fronting the lot. In most cases, subdivision of land with reverse frontage lots is dictated by a municipality’s secondary plan requirements, is typically an arterial or major collector road and is for the benefit of the travelling public across several communities. Staff assessed the issue regarding reverse frontage lots and considered two options:

Option 1 - Require Developers to pay for services along the rear of reverse frontage lots on the basis that developers should take into account the cost of all streets abutting their plan in acquiring and developing land.
Option 2 - Allow an exemption from payment by a developer for existing or future works along the rear of a reverse frontage lot, but only where a developer is required by the City to develop such lot designs.

It is the opinion of staff that Option 2 is more fair and reasonable because, where the City has mandated reverse frontage lots by its secondary plan, a developer has no option in considering whether or not subdivision of land by reverse frontage lots is financially feasible. However, where a developer has chosen to subdivide land with reverse frontage lots then, they have done so taking into consideration all costs in the streets abutting the plan and, from a marketing and financial perspective, have concluded that it is still feasible and desirable to develop. In these cases, it is the opinion of staff that the developer should pay its share of servicing costs for the streets along the rear of reverse frontage lots within their plan. The exemption policy shall apply to reverse frontage single and semi-detached lots and multiple dwellings with freehold lots (i.e. street townhouses) where the City has mandated subdivision of land by reverse frontage design. There is a similar situation with freehold lots on shared service roads where the City has mandated no direct access to the existing, adjacent major road. Both of these situations should be reviewed in the context of the new Development charge By-law.

**FINANCIAL/STAFFING/LEGAL IMPLICATIONS:**

Financial – Implementation of the City’s over-sizing policy as proposed by this report impose no financial implications on the City levy. By allowing the over-sizing limits of the existing Development Charge By-laws to prevail over the policy until a new Development Charge By-law is completed, this transitional period will prevent any non-eligible funding from existing Development Charge Reserves.

Under the new financial policy for development, a front-ending developer must pay the up front cost of all works installed adjacent to lands owned by others. There will be no cost sharing or front ending by the City for works installed adjacent to lands of other owners. This section of the policy prevents the City from the financial burden of carrying servicing costs associated with undeveloped land for an indefinite period of time. If the City were to consider cost sharing for front-end works adjacent to lands of other owners, then the amount of City funds expended on works constructed but never recovered would continue to grow over the years. In the opinion of staff, this financial burden poses an unnecessary and inappropriate liability to the City and, alternatively, should be at the risk of a developer.

Staffing – Implementation of the recommendations in this report imposes no additional staffing implications on the corporation.
SUBJECT: Development Engineering Guidelines; Sidewalk and Financial Policies for Development; and Response to Hearings Sub-Committee Outstanding Business – as at April 2, 2003 - Item AA (Sidewalks on Highvalley Road, Ancaster) (PD03060) (FCS03073) (PW03027) - Page 30 of 31

Legal – As the recommended financial policy is being created ahead of a new Development Charges By-law for the City of Hamilton, portions of the policy which deal with cost sharing for over-sizing of services in development, conflict with some of the existing Development Charges By-laws of the former municipalities.

Over-sizing of roads, sewers and watermains is generally known as the “growth related” portion of the infrastructure cost which cost is recovered by a municipality from all of development through its Development Charge. A municipal Development Charge By-law identifies the limit of the “growth related” portion of municipal infrastructure. Where the limits for over-sizing of infrastructure in the new financial policy conflict with the existing By-laws, the City is legally required to honour the limits for Growth related services previously established under the existing Development Charge By-laws until a new By-law is passed by the City.

Therefore, during the transitional period of time after adoption of the financial policy, and prior to adoption of a new comprehensive Development Charge By-law by the City, the City must comply with the provisions established under the existing Development Charge By-laws.

Policies Affecting Proposal:

The Development Engineering Guidelines, sidewalk policies and financial policies recommended in this report propose to replace all existing financial policies for development adopted by the former municipalities, of the Town of Ancaster, Town of Dundas, Town of Flamborough, Township of Glanbrook, Corporation of the City of Hamilton, City of Stoney Creek and the Regional Municipality of Hamilton-Wentworth.

Consultation with Relevant Departments/Agencies:

Development of the City’s engineering guideline, sidewalk and financial policy began in 1990 with preliminary discussions involving development engineering staff of the former municipalities, which make up the new City of Hamilton. Comparisons and differences between policies were noted at that time. In addition, development staff surveyed other municipalities outside the City of Hamilton such as Kitchener, London, Mississauga, Burlington and the Region of Waterloo in order to determine how other municipalities dealt with matters of development related to engineering design and the financial aspect of development. From this analyses, guided by the City’s Project Consultant, a draft of the engineering guidelines and policies were prepared for review by staff, first in 1997 and then a revised version in late 2001.

Further discussions on the draft guidelines and policies with Development staff, the Consultant, the Director of Development, the General Manager of Planning and
Development and staff from Capital Budgets and Development in the Finance Department resulted in numerous revisions and subsequent discussions over the course of 2002.

By the Fall of 2002, a copy of the draft policy was circulated to members of the Hamilton Halton Home Builders Association for their review and comment. In addition, Development Staff extended an invitation to the development and consultant industry to attend a workshop presentation of the guideline and policies at City Hall on January 15, 2003. From the workshop presentation, the Homebuilders Association submitted comments to the City on the new policy (attached as Appendix “F”). At a meeting of the Homebuilders Association Liaison committee on February 7, 2003, the comments and concerns of the Homebuilders with the guidelines and policies were discussed with staff from the Development Division and Legal Department. From those discussions, a final draft of the guidelines and policies was prepared, taking into consideration comments and concerns raised by the Homebuilders Association. A draft copy of the staff report was subsequently circulated to the City’s Legal, Finance and Public Works Departments for review and comment. This final report has now been prepared for submission to Committee and Council with comprehensive recommendations relating to the engineering guidelines, sidewalk, financial policy and transition policies.

The technical components of several of the engineering guidelines are still under discussion with the Department of Public Works. Any future changes will be made to these technical standards after Council consideration, but prior to final production of the document and its distribution to the development community and consultant industry.

**CITY STRATEGIC COMMITMENT:**

Adoption of the Development Engineering Guidelines and Policies within this report will ensure a consistent application of design requirements for new developments in the City of Hamilton.

The guidelines and policies are consistent with the City of Hamilton’s goal to provide a financially sustainable, healthy, safe, green city which will inspire community pride. The policy encourages improved streamlined processes consistent with the City’s “Open for Business” and “Open for Opportunity” initiatives, as well as producing a better informed public by enhanced communication of the requirements for new developments. This initiative will also contribute towards assisting the City in its goal to attract and retain economic development.

:MJI

Attachs. (7)
Development
Engineering Guidelines

Version 2003.03.12

City of Hamilton
April 1, 2003
# Table of Contents

1 **Introduction** .............................................................................................................. 1- 1  
  1.1 General ................................................................................................................ 1- 1  
  1.2 City’s Jurisdiction ............................................................................................... 1- 1  

2 **Land Development** .................................................................................................... 2- 1  
  2.1 General ................................................................................................................ 2- 1  
  2.2 Engineering Services .......................................................................................... 2- 1  
  2.3 Preliminary Engineering .................................................................................... 2- 1  
  2.4 Final Engineering Design .................................................................................. 2- 4  
    2.4.1 Engineering Drawings ............................................................................. 2- 6  
    2.4.2 Sanitary Sewer Design Criteria ........................................................ 2-14  
    2.4.3 Storm Sewer Design Criteria ................................................................. 2-20  
    2.4.4 Watermain Design Criteria ..................................................................... 2-26  
    2.4.5 Road works Design Criteria ..................................................................... 2-32  
    2.4.6 Erosion and Sedimentation Control ....................................................... 2-45  
    2.4.7 Easements .............................................................................................. 2-46  
  2.5 Lot Grading Policy, Criteria and Standards ......................................................... 2-47  
  2.6 Construction of Municipal Services ................................................................. 2-52  
  2.7 As-Constructed Drawings ................................................................................ 2-60  
  2.8 City of Hamilton Subdivision Agreement ....................................................... 2-61  
  2.9 Building Permits ................................................................................................. 2-61  

3 **Financial Policies** .................................................................................................... 3- 1  
  3.1 Oversizing of Infrastructure .............................................................................. 3- 1  
  3.2 Cost Sharing for frontage .................................................................................. 3- 2  
  3.3 Best Efforts Obligation....................................................................................... 3- 5  
  3.4 Cost Recovery Policies ..................................................................................... 3- 5
Appendices

Appendix 1
Pre-application checklist for Issue Identification

Appendix 2
Standard subdivision notes

Appendix 3
Notes on Grading Plans

Appendix 4
Soil Test Evaluation criteria

Appendix 5
Sanitary Sewer Design Calculation Sheet

Appendix 6
Typical locations of Services

Appendix 7a
Storm Sewer Design Calculation Sheet

Appendix 7b
Design values of αCi

Appendix 8
Watermain looping in cul-de-sacs detail

Appendix 9
Typical Road Cross-sections

Appendix 10
Details

Appendix 11
Pre-construction check list

Appendix 12
Format for Security Reduction Requests

Appendix 13
City of Hamilton Subdivision Agreement
Introduction

1.1 General

In order to complete the land development process in the City of Hamilton, ("City"), it will be necessary for the Developer to engage the services of a qualified professional engineer, ("Engineer"), to address municipal engineering requirements of the City.

This manual is intended to be a guide in assisting developers, land owners, municipal engineers, planners, architects and all others involved in the land development process to evaluate the criteria for any engineering submissions required to be made in support of a development proposal.

The information provided in this manual is general in nature and is not meant to relieve the Developer and the Engineer of the responsibility of submitting a finished product of competent engineering design and construction. For any form of consideration made to deviate from minimum City standards, the Engineer shall submit a detailed proposal outlining the deviation, with the necessary justification and analysis, for consideration by the City prior to formal engineering submissions.

1.2 City’s Jurisdiction

The City has the jurisdiction over and is responsible for the engineering requirements for:

- sanitary sewers and wastewater treatment,
- storm sewers and storm water management,
- watermains and water supply,
- roadways, including asphalt pavement, curbs, subdrains, sidewalks, walkways, etc.,
- fencing,
- tree planting, sodding of boulevards,
- lot grading, and
- street lighting and municipal consent ("mc") for construction of utilities
The engineering submissions shall be made to:

City of Hamilton  
Planning and Development Department  
Development Division, Development Engineering Section  
7th Floor, Hamilton City Hall  
71 Main St. West  
Hamilton, Ontario  
L8P 4Y5  

Attn: Manager, Development Engineering

All developers and their engineers are encouraged to meet with the Development Engineering Section, as early as possible, to clarify the City’s requirements for the scope of engineering submissions required on individual projects, to discuss any site-specific requirements that may be identified and to identify cost sharing financial policies that may be applicable.

The City has also entered into a Memorandum of Understanding with the following Provincial Ministries to review development applications on their behalf:

1. Ministry of Municipal Affairs and Housing (MMAH)  
2. Ministry of Environment (MOE)  
3. Ministry of Natural Resources (MNR)  
4. Ministry of Citizenship, Culture and Recreation (MC2CR)  
5. Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
2

Land Development

2.1 General

This section deals with the steps required in the development of land for subdivisions by means of a registered plan of subdivision. This would involve filing a draft plan of subdivision with the City and obtaining draft plan approval subject to a list of conditions. Once the conditions of draft plan approval have been satisfied, the final plan of subdivision can be registered, thereby creating building lots.

2.2 Engineering Services

The Developer shall retain a Professional Engineer, ("Engineer"), licensed to practice in the Province of Ontario, who is experienced in the design and execution of land development projects, to provide the following engineering services, to the satisfaction of the City:

1. Preliminary investigation
2. Layout drawings
3. Estimates of cost
4. Design methodology with associated calculations
5. Contract drawings and specifications
6. Application to the Ministry of Environment for approval of sewers and watermains, and storm water management facilities (if applicable)
7. Application for other permits required to construct the work as may be necessary
8. Calling of tenders, if so requested by the City
9. Analysis of bids and recommendation to the Developer and the City
10. Setting out of the work
11. General administration of the Contract (as per P.E.O.)
12. Resident Supervision of Construction (as per P.E.O.)
13. Preparation of As-constructed Drawings

2.3 Preliminary Engineering

During the pre-application consultation process, as described in the City's Development Guide to Planning Applications, the need for a preliminary engineering report will be identified in the "Pre-Application Checklist for Issue Identification". (See Appendix 1)
A Preliminary Engineering Report, if required, shall be submitted to the City Planning and Development Department with the draft plan application. It shall include, but not be limited to, the following:

a) Contour Plan and Draft Plan of Subdivision
   - Existing ground contours at sufficient intervals to permit assessment of surface drainage patterns. This plan should be at a scale not smaller than 1:1000, and can be combined with the draft plan of subdivision.

b) Sanitary Sewer System
   - existing sanitary sewer outlet information (size, slope, location)
   - drainage areas and proposed flows
   - functional design of sanitary sewers
   - identification of potential constraints, if any, and how they have been addressed. Any mitigation measures proposed shall be detailed.

c) Storm Drainage System
   - existing storm sewer outlet information (size, slope, location)
   - drainage areas, proposed flows and functional design of storm sewers
   - designation of major and minor drainage systems, assessment of any storm water management facilities together with functional design, and
   - identification of potential constraints, if any, and how they have been addressed. Any mitigation measures proposed shall be detailed.

d) Watermain Distribution System
   - existing watermain information (sizes, locations, looping, pressure boundaries)
   - functional watermain distribution system design
   - identification of potential constraints, if any, and how they have been addressed

e) Roadways
   - identification of collector roads where additional pavement widths and special pavement design is warranted
   - the need for assessment of the impact of the development on any adjacent roads, and
   - identification of potential constraints, if any

f) Special Reports
   - For development in rural areas, where private or communal services are being proposed, the City will require special hydrogeological studies to be conducted to evaluate the potential for development of the lands. Before commencing on any special reports, it is recommended that the terms of reference for the special study be submitted for approval by the City.
Four (4) copies of the Preliminary Engineering Report shall be submitted with the application for draft plan approval to:

City of Hamilton  
Planning and Development Department  
Development Division, Development Planning Section  
7th Floor, Hamilton City Hall  
71 Main Street West  
Hamilton, Ontario  
L8P 4Y5  
Attn: Manager, Development Planning
2.4 Final Engineering Design

Once the Developer has obtained draft plan approval for the subdivision, a detailed engineering submission can be made to:

City of Hamilton
Planning and Development Department
Development Division, Development Engineering Section
7th Floor, Hamilton City Hall
71 Main St. West
Hamilton, Ontario
L8P 4Y5

Attn: Manager, Development Engineering

The first engineering submission shall consist of:

a) two (2) copies of the final survey plan
b) three (3) sets of detailed engineering drawings
c) two (2) sets of sanitary sewer and storm sewer calculation sheets
d) two copies of a stormwater management report (if applicable)
e) two (2) copies of a geotechnical report
f) one (1) copy of any other relevant reports or drawings (traffic impact, noise impact, archaeological assessment, etc.)
g) a draft copy of the engineering cost estimates, (Schedule “F”)
h) a checklist showing how the development engineering draft plan conditions have been addressed, and
i) payment of Stage 2 City Subdivision Processing Fees, based on current fee at the time the engineering submission is made (see User Fee Bylaw).

The design of municipal services shall be based upon the specifications and standards in effect at the time the engineering drawings are approved. The City Planning and Development Department, Development Engineering Section, shall approve all engineering drawings but such approval shall in no way relieve the Engineer of the responsibility to design adequate and safe services.

All sanitary sewers, storm sewers, watermains and their appurtenances and all roadways being constructed within the City of Hamilton, shall conform to the City of Hamilton Standard Specifications (latest edition) which is available from the City’s Public Works Department.

Overall drainage area maps of trunk sanitary sewers and trunk storm sewers are available for viewing at the City Development Engineering Section. Overall watermain distribution maps are also available for viewing and for use as a guide for the design of the watermains within the project.

Upon review of the first submission of engineering drawings and the cost schedules by the City, the Engineer shall amend the drawings and schedules to incorporate the comments and shall resubmit two (2) sets of the detailed engineering drawings for final approval. The cost schedules shall be amended, if necessary, and re-submitted to the
City for final approval in electronic form (Word 2000 format or alternate format acceptable to the City).

The Engineer is also required to co-ordinate the municipal consent process for utilities. See Section 2.4.5.19 for the Municipal Consent procedure to be used. Generally, at the time of initial engineering submission to the City, the utility companies shall be notified by the Engineer of the proposed development. When the second submission is made for approval to the City, the Engineer shall provide the utility companies with a set of engineering drawings so that they can complete the design of their plant.

Upon completion of the design of their individual plant, the utility companies shall forward their design to the Engineer, who shall check for any conflicts. The aboveground utility plant shall be shown on the Lot Grading Plan for submission to the City for final approval. The Engineer shall sign the Municipal Consent form, certifying that there are no conflicts, and forward the utility plans to the City for approval.

The Engineer shall also submit MOE forms for a Certificate of Approval for sanitary sewers, storm sewers and watermains. Two additional sets of engineering drawings, individually folded, shall be provided to the City to accompany the MOE application under the Transfer of Review Program between the City and the MOE. Review and administration fees specified in the MOE applications for sewage works and water works are included in the City's Stage 2 Subdivision Processing Fees.

Projects that involve stormwater management facilities require the MOE application to be submitted directly to the MOE for approval, however, the application forms shall be submitted to the City for signature as the operating authority. The Developer shall be responsible for any fees payable to the MOE for this review.

The City Development Engineering Section shall prepare the City of Hamilton Subdivision agreement. To assist in the preparation of these agreements, the Developer shall require an Ontario Land Surveyor to submit the following to the Development Engineering Section:

  a) sixteen (16) full size copies of the final plan of subdivision, signed by the surveyor and the Owner
  b) six (6) reduced copies (8½" x 14") of the final plan of subdivision, signed by the surveyor and the Owner
  c) one (1) copy of the certified Lot and Block Areas and Frontage data and the total area for the entire final plan of subdivision
  d) one (1) copy of the legal description of the final plan of subdivision on 8½" x 14" legal size paper, signed and dated by the Ontario Land Surveyor
  e) four (4) copies of any reference plans required for land dedications and/or easement transfers
  f) one (1) copy of a land appraisal, where required, in accordance with the City's Parkland Dedication policy, showing the calculated amount for any required cash-in-lieu of park dedication (where sufficient land is not being dedicated for park purposes), or where excess park dedication has to be acquired by the City), and
  g) written confirmation of:
     • Owner’s legal name on title to the lands being developed
• full names of the signing officers and positions within the company
• mailing address of the Owner of the lands, and
• name and address of the Owner's lawyer.

2.4.1 Engineering Drawings

The detailed engineering drawings submitted by the Developer's Engineer shall be subject to the following:

a) All drawings shall be in metric and shall be neat, legible and completed in ink.
b) Lettering shall be done using a lettering template with a minimum size of 80.
c) Sheet size shall be metric A1 (594mm x 841mm) or Imperial (24"x36"). External sanitary and storm drainage area plans for overall catchment areas may be submitted on larger size sheets for convenience of presentation.
d) Plan-profile drawings shall be to a scale of 1:500 horizontal and 1:100 vertical, except when drawings for existing roadways are required, when a larger scale would be more suitable.
e) All drawings shall contain a key plan, north arrow, title block showing the name of the Engineer together with the sheet title and current revision status.
f) All drawings shall be sealed, signed and dated by the Engineer responsible for the design.
g) All elevations are to relate to a geodetic datum acceptable to the City, and the bench mark shall be described on all the drawings.

The detailed engineering drawings shall consist of the following:

a) Title Sheet
b) General Plan of Services
c) Lot Grading Plan
d) Erosion and Sedimentation Control Plan
e) Plan-Profile Drawings
f) Sanitary Drainage Area Plan
g) Storm Drainage Area Plan
h) Other drawings as required (example: Tree Preservation Plan)

2.4.1.1 Title Sheet

A Title Sheet shall be included for every subdivision that includes more than one street that is being constructed as part of the plan of subdivision. All Title Sheets shall contain the following information:

1) Name of Municipality (City of Hamilton)
2) Key Plan showing the location of the proposed development
3) Name of the Development
4) Name of the Engineer
5) List of drawings
2.4.1.2 General Plan of Services

A General Plan of Services shall be prepared for every subdivision that includes more than one street that is being constructed as part of the plan of subdivision.

If possible, a scale of 1:500 shall be used. For larger subdivisions, an appropriate scale shall be selected, but in no case shall it be smaller than 1:1000.

The following information shall be shown on the General Plan of Services:

a) All road allowances, lots and blocks in the plan of subdivision and those immediately neighbouring the subdivision.

b) Proposed sanitary and storm sewers including diameter of pipe and direction of flow, manholes, culverts, road catchbasins and rear yard catchbasins (if applicable).

c) Proposed watermains (including diameter of pipe) and appurtenances.

d) Proposed curbs and sidewalks

e) Existing services surrounding the subdivision and their relation to the proposed work.

f) Description of the nearest geodetic benchmark. Site benchmarks should also be shown and described.

g) General Notes describing the construction of services. For larger subdivisions it is preferable to have the notes on a separate page. A sample of the General and Standard Notes to be used on a subdivision is included as Appendix 2. These notes are constantly being updated and the Engineer should use only the notes applicable to the subdivision that are current at the time of design and construction. The most recent OPSD and City Specifications shall be referenced in the notes.

h) Typical road cross-sections with pavement design

2.4.1.3 Lot Grading Plan

Lot grading plans shall be drawn to a minimum scale of 1:500 and shall be fitted on a standard metric A1 sheet or imperial 24" x 36" sheet. Additional sheets with appropriate match lines shall be used if the subdivision does not fit on a single sheet.

The following information shall be shown on all lot grading plans:

a) Existing ground contours at 0.5m intervals over the entire subdivision and sufficient area of adjacent lands to establish the overall drainage pattern.

b) Along the perimeter of the subdivision, existing ground elevations obtained by an actual field survey, shall be shown at the lot corners of all existing abutting properties and along 3 lines parallel to the subdivision perimeter lot line, (at approx. 2.5m, 5.0m and 7.5m from the perimeter lot line), into the adjoining property.

If the adjoining property is large, then existing ground elevations along the common property line and along 3 parallel lines, (distant 5m, 10m and 15m from the common property line), within the adjoining property, taken at a min. spacing
of 15m shall be shown, as well as at all locations where the ground topography changes abruptly.

The Engineer shall determine if there is an approved draft plan of subdivision on adjacent vacant lands and shall co-ordinate the grading with the engineer of the adjacent development, so as to match proposed and existing grades.

c) The location of all existing trees, septic tanks and tile fields, wells, existing above ground utility structures and other structures as necessary.

d) Proposed ground elevations at all lot corners and at intermediate points for change in grade. On large blocks, proposed ground elevations at 15m spacing along the frontage of the block and at reasonable spacing along the sides and rear of the block shall be shown.

e) Proposed ground elevation at the front of all dwellings on the proposed lots. For split type drainage patterns where the elevation at the rear (or side) of the dwelling shall vary by more than 0.4m from the elevation at the front of the dwelling, the proposed ground elevation at the rear (or side) of the dwelling shall also be specified.

f) Minimum basement floor elevations of the proposed dwellings. Minimum basement floor elevations shall be calculated based on the elevation of the sanitary (and/or storm) private drains. For all practical purposes, and unless the design of the services indicates special consideration for the private drains, the generally accepted practice is that the minimum basement floor elevation is 1.6m lower than the centerline of the road at the location of the private drain.

g) Proposed road centerline elevations at all changes in grade, at all intersections and opposite each proposed lot and block corner. If the frontage of the blocks is large, proposed centerline road elevations at 15m spacing shall be provided.

h) Direction of surface drainage on all lots and blocks.

i) Location of any proposed private rear yard catchbasins and the top of grate elevations.

j) Location of any proposed retaining walls with proposed top of wall elevation and ground elevation at bottom of wall at appropriate intervals with sections. Where any major retaining walls are proposed that exceed 2m in height and 50m in length, the Engineer should provide a longitudinal section for the length of the wall and provide construction details on a separate drawing.

k) All existing and proposed slopes and embankments showing top and bottom of slope/embankment elevations and degree of slope (e.g. 3:1).

l) Existing and proposed curb and sidewalks.

m) Typical sections for all proposed drainage courses and swales.

n) Typical details of proposed drainage types of houses and lots.
o) Location of all road catchbasins, hydrants, street lights and hydro transformers, telephone and cable boxes.

p) All existing and proposed easements within the subdivision.

q) Standard Lot Grading Notes (see Appendix 3).

r) Key Plan showing the proposed development and, for larger subdivisions, the location of the lots on the sheet in relation to the overall development.

s) Any additional plans, sections and details for drainage courses and erosion protection, irregular or steep topography, and screening and noise abatement features as may be required.

t) Description of the nearest geodetic bench-mark and site bench marks.

2.4.1.4 Erosion and Sedimentation Control Plan

The Erosion and Sedimentation Control Plan may be submitted with the Lot Grading Plan or as a separate plan.

It shall show details of controls for road and rear yard catch basins and location of sediment control fencing.

Any special measures required on a site specific basis to mitigate sediment contamination of affected creeks, adjacent properties, storm sewer systems and storm water management facilities shall be detailed. Consultation with the Conservation Authority is recommended when draining surface run-off to areas regulated under the Conservation Authorities Act.

2.4.1.5 Plan-Profile Drawings

Plan profile drawings shall be prepared for all streets proposed within the plan of subdivision as well as for any existing streets on which major reconstruction and/or construction is being proposed. Easements for services and public walkways shall also require plan-profile sheets.

The following guidelines shall be used in the preparation of Plan-Profile drawings for submission to the City Planning and Development Department, Development Engineering Section:

1) General

1.1 All plan-profile sheets for proposed streets shall be drawn at a scale of 1:500 horizontal and 1:100 vertical.

1.2 Plan-profile sheets for reconstruction or construction on existing roads within an urban area may be drawn at a scale of 1:250 horizontal and 1:50 vertical, at the discretion of the Engineer, depending on the detail required to be shown on the drawing.
1.3 The profile portion of the drawing shall be a vertical projection of the plan portion, wherever possible.

1.4 All road allowances, lots, blocks, easements, reserves are to be shown and identified in accordance with the notation on the Final Survey Plan. Lot and Block frontages and bearings are to be shown and must correspond with the Final Survey Plan.

1.5 Dimensions of the road allowance and at least one set of dimensions from the property lines to proposed curbs, sidewalks, sewers, and watermains shall be shown on each sheet.

1.6 A key plan identifying the subdivision and the relationship of the proposed street within the subdivision shall be provided.

1.7 Two short streets may be shown on one plan-profile drawing.

2) Plan view requirements

2.1 The street name or easement number shall be prominently centered over the top of the plan portion of the drawing.

2.2 Generally, the plan view shall be drawn such that the north arrow is pointing towards the top of the page and/or to the right of the page.

2.3 All existing sewers, watermains, curbs, sidewalks, etc. shall be shown and labeled as "existing". All proposed sewers, watermains, curbs, sidewalks, etc. need not be labeled as "proposed" but shall be distinguished from the existing services by line type and size/style of lettering.

2.4 Only the size and type of the proposed and existing sewer and watermain shall be labeled (e.g. 250mm Sanitary).

2.5 Where intersecting streets (or easements) are shown in plan view, only the size and type of sewer and direction of flow of the intersecting sewers are to be shown.

2.6 All sewer manholes shall be numbered. Sanitary manhole numbers shall be distinguished from storm manholes by the prefix "A", (e.g. MH A2).

2.7 Road catchbasins and connections shall be shown. Rear yard catchbasins and connections shall be shown with adequate details regarding top of grate elevation, location of catchbasins and connection in relation to rear and side property lines, standard drawing detail, inverts, length and grade of connection, pipe material and class of bedding.

2.8 Hydrants, valves and other appurtenances on the watermain shall be shown and labeled with details regarding standard drawing details and location.

2.9 Locations of sanitary private drains and storm private drains (if applicable) and private water services for each lot and block within the subdivision shall be shown.
2.10 Details and specifications for the proposed curbs and sidewalks shall be shown. All transitions from different types shall be properly labeled and dimensioned. Curb radii at intersections shall be shown and curb radius and angle of intersection of other horizontal curves shall be adequately indicated.

2.11 Match lines for continuation of the street shall be clearly marked.

2.12 Borehole locations and numbers shall be shown.

2.13 Cross reference drawing numbers of adjoining plans.

2.14 Cross reference to general notes drawing number

3) Profile view requirements

3.1 The following profiles shall be shown:
   - Existing ground over centerline of road/easement
   - Proposed centerline road/easement
   - Sanitary and storm sewers
   - Watermains, 400mm in size and larger.

3.2 Proposed sewers shall be detailed for each section including size and type of sewer, length and grade, pipe material specifications and class of bedding.

3.3 Manholes shall be numbered and distinguished to correspond to the numbering in plan view. Manhole details such as standard drawing number and any required information such as diameter of base, top of grate elevation, drop-pipe requirements, safety gratings shall be shown. Construction details are to be referred to the applicable City of Hamilton Drawings or Ontario Provincial Standard Drawings (OPSD).

3.4 All sewer inverts at manholes shall be given and adequately described.

3.5 For 400mm dia. and larger watermains, chainages, inverts, length and grade of each section, and pipe material specifications shall be shown. Locations of hydrants and other appurtenances shall be adequately described.

3.6 Proposed centerline road grade, chainages of P.V.I.s, intersections, and vertical curve data shall be adequately shown and described.

3.7 Borehole logs shall be plotted with brief description of soils and water level, as well as rock elevations (if applicable). If the borehole log interferes with other details such as a manhole, the exact location of the borehole may be altered sufficiently for clarity.

### 2.4.1.6 Sanitary Drainage Area Plan

The Sanitary Drainage Area Plan shall be drawn at the same scale as the General Plan of Services.
It shall include the following information:

1. All streets, lots, blocks, easements and other lands within the plan of subdivision.

2. Proposed sanitary sewers, including size, length and grade, manholes, manhole numbers, and direction of flow, and details of the receiving sewer.

3. The drainage areas within the subdivision and the limits of external areas draining into the proposed system. The area contributing to each manhole shall be clearly outlined and the area in hectares and population density in persons per hectare, shall be indicated on all drainage areas.

If the contributing area to a manhole is made up of areas with different population densities, the sub-areas showing the individual area in hectares and the population density shall be clearly shown.

If the external drainage area is large, it may necessitate the preparation of an external drainage area plan. External drainage area plans may be prepared at a smaller scale, but shall show the existing ground contours to beyond the limit of the drainage area. Planned street patterns (if available) shall be shown to determine the route of the future sewers.

2.4.1.7 Storm Drainage Area Plan

The Storm Drainage Area Plan shall be drawn at the same scale as the General Plan of Services and shall include the following:

1. All streets, lots, blocks, easements and other lands within the plan of subdivision.

2. Proposed storm sewers, including size, length and grade, manholes, manhole numbers, direction of flow and details of the outlet sewer or receiving watercourse and/or stormwater management facility.

3. The drainage areas within the subdivision and the limits of external areas draining into the proposed system. The area contributing to each manhole shall be clearly outlined and the area in hectares and runoff coefficient shall be indicated on all drainage areas.

If the contributing area to a manhole is made up of areas with different runoff coefficients, the sub-areas showing the individual area in hectares and the runoff coefficient shall be clearly shown.

If the external drainage area is large, it may necessitate the preparation of an external drainage area plan. External drainage area plans may be prepared at a smaller scale, but shall show the existing ground contours to beyond the limit of the drainage area. Planned street patterns (if available) shall be shown to determine the route of the future sewers.
2.4.1.8 Other Plans

Detail drawings shall be prepared whenever necessary by the Engineer for special features not covered by the City's Standard Drawings or OPSD. These special details shall be drawn on standard sized sheets and included as part of the engineering drawings.

2.4.1.9 Geotechnical Soils Report

Soil test borings shall be placed at intervals not exceeding one hundred and fifty (150m) metres and to a depth of not less than three and one half (3.5m) metres below the proposed pavement grade or refusal to rock.

The geotechnical report shall also identify potentially corrosive soil environments for ductile iron pipe in accordance with the 10-point soil evaluation procedure included in ANSI/AWWA C105/A21.5. Details of the Soil Test Evaluation Criteria are attached as Appendix 4.

Soil classification and water levels shall be recorded and noted on the plans and profiles submitted.
2.4.2 Sanitary Sewer Design Criteria

2.4.2.1 General Requirements

The following criteria are recommended minimum requirements for the design of sanitary sewers within the City. Sound engineering judgment of the Engineer shall always prevail in the actual design.

Sanitary sewers shall be designed to service the lands within the subdivision and any external drainage areas as may be required. Foundation drains, weeping tiles and roof drainage are not permitted to be discharged into the sanitary sewer.

In the case where the outlet sewer is a combined sewer, the subdivision shall be designed for separate sanitary and storm sewers and an inter-connection shall be made at the limit of the subdivision. In all instances where the subdivision discharges into a combined sewer, the Engineer shall contact the City Planning and Development Department during the preliminary engineering stage to determine the constraints, if any, that may limit the discharge into the combined sewer system.

The Engineer shall submit sanitary sewer design sheets in accordance with the sample design sheet attached as Appendix 5. An electronic copy of the spreadsheet in Excel format shall be submitted to the City upon approval of the design.

2.4.2.2 Location

The sanitary sewer shall normally be centered within the road allowance or easement. When sanitary and storm sewers are constructed in a common trench, the storm sewer shall be constructed parallel to the sanitary sewer with 450mm minimum separation between the outside walls of the two pipes.

Generally, the installation of sanitary sewers shall be located in public right-of-ways. In special circumstances where there are no viable alternatives to installing the sewer other than in an easement, the Engineer shall obtain approval from the City Planning and Development Department during the preliminary engineering stage to install the sewers in an easement.

2.4.2.3 Depth of Sewer

The minimum depth of cover shall be 2.75m below the centerline elevation of the proposed road. However, the Engineer shall investigate the profile of the sanitary sewer to the upper reaches of the sanitary drainage area, taking into consideration potential conflicts with storm sewer crossovers and possible future road profiles along the route of the future sanitary sewer.

If the profile of the sanitary sewer necessitates the placement of fill in excess of 0.6m on lands outside the subdivision, the Engineer shall be required to demonstrate that reasonable care has been taken to ensure that the design of the sanitary sewer has been optimized so as to minimize the impact of fill on those lands.
2.4.2.4 Design Flows

The design flow for sanitary sewers shall be based on the following formula:

\[
\text{Design Flow} = \text{Average Dry weather flow} \times \text{Peak Factor} + \text{Infiltration Allowance}
\]

Sanitary sewers shall be designed for 360 litres per day per capita. The average dry weather flows for the sanitary sewer shall be based on the population densities of the area being serviced by the sewer. The Engineer shall obtain the current neighbourhood secondary plans for the catchment area and assign densities based on the designations for the lands in the neighbourhoods. If no secondary plans are available for future external areas, the Engineer shall, in consultation with the City Planning and Development Department, assign average densities that reflect a probable development pattern for the future lands.

The following guidelines are provided for the use of the Engineer in assigning densities:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single detached</td>
<td>60 - 75 ppha</td>
</tr>
<tr>
<td>or Semi-detached</td>
<td></td>
</tr>
<tr>
<td>Townhouses</td>
<td>110 ppha</td>
</tr>
<tr>
<td>Medium Density</td>
<td>250 ppha</td>
</tr>
<tr>
<td>apartments</td>
<td></td>
</tr>
<tr>
<td>High Density</td>
<td>varies (subject to detailed plans)</td>
</tr>
<tr>
<td>apartments</td>
<td></td>
</tr>
<tr>
<td>Parks</td>
<td>12 to 25 ppha</td>
</tr>
<tr>
<td>Schools and</td>
<td>75 to 125 ppha</td>
</tr>
<tr>
<td>Institutional</td>
<td></td>
</tr>
<tr>
<td>Uses</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>varies 125 to 750 ppha</td>
</tr>
<tr>
<td>Business</td>
<td></td>
</tr>
<tr>
<td>Districts</td>
<td></td>
</tr>
</tbody>
</table>

The peak factor shall be obtained by using the Babbitt Formula:

\[
M = \frac{5}{P^{0.2}}
\]

where \(M\) = peak factor where \(2 \leq M \leq 5\)

\(P\) = number of persons in thousands contributing to the sewer

An allowance shall be made in the sanitary sewer design for infiltration into the sewer system as follows:

For areas where the design of the storm sewers allows for deep gravity storm sewers, i.e. the storm sewer is below the weeping tiles of the dwellings, or where a separate foundation drain collector sewer is proposed, the infiltration factor shall be 0.2 litres per second per hectare.

For areas where there are no storm sewers or shallow storm sewers, i.e. where the weeping tiles of the dwellings are drained by sump pumps, the infiltration factor shall be 0.4 litres per second per hectare.

2.4.2.5 Capacities, Velocities and Sizes

Generally, new sanitary sewers shall be designed to flow at a maximum of 75% full design capacity of the pipe for sizes up to and including 450mm diameter pipes.
Where there is a large external area with no secondary plan determined at the time of design, the Engineer shall use sound engineering judgement in selecting the pipe capacity.

Manning's formula shall be used in determining the capacity of the sanitary sewers as follows:

\[
Q = A \frac{V}{n R^{2/3} S^{1/2}}
\]

and

\[
V = \frac{1}{n} R^{2/3} S^{1/2}
\]

\[
R = \frac{A}{P}
\]

where

- \( Q \) = Capacity of the pipe flowing full (m\(^3\)/sec)
- \( V \) = Velocity (m/sec)
- \( R \) = Hydraulic radius (m)
- \( A \) = Cross-sectional Area of pipe (m\(^2\))
- \( P \) = Wetted perimeter (m)
- \( S \) = Gradient of pipe (m/m)

and

\[
n = \text{Manning's factor} = 0.013 \text{ for all pipe sizes and pipe materials}
\]

The minimum design velocity for the sanitary sewer shall be 0.75 m/sec flowing full and maximum velocity shall not exceed 2.75 m/sec. However, the Engineer shall investigate the actual velocity in the sewer for instances where the design flows are low (example: in cul-de-sacs), and make a reasonable attempt to obtain self-flushing velocities.

The minimum size of the sanitary sewer shall be 250mm diameter. 200mm diameter shall be permitted on the last run of sanitary sewers such as in cul-de-sacs or crescents where there will be no further upstream contribution.

Generally, no decrease of pipe size from a larger upstream pipe to a smaller downstream pipe shall be allowed, regardless of increase in grade, velocity and capacity. The design of the sewers shall be such that there is no decrease in velocity and capacity from the upstream pipe to the downstream pipe. In cases where this is unavoidable, care should be taken to ensure that an appropriate drop is incorporated in the manhole to dissipate the excess energy.

2.4.2.6 Pipe Materials, Classification and Bedding

**Pipe material acceptable for sanitary sewers**

<table>
<thead>
<tr>
<th>Material</th>
<th>Minimum Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC (Polyvinyl Chloride)</td>
<td>200mm and larger</td>
<td>Rubber adaptor or manhole stub sanded spigot end.</td>
</tr>
<tr>
<td>ASTM D3034 DR 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforced Concrete</td>
<td>300mm and larger</td>
<td></td>
</tr>
<tr>
<td>CSA A257.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Vitrified Clay Pipe
CSA A60.1 and A60.3

PVC (Polyvinyl Chloride)
CSA B.182.1 DR 28

200mm and larger
150mm

For sanitary private
drains (coloured pipe).

Substitution of pipe material from the approved drawings must be approved by the City and Engineer prior to use.

Transition from one pipe material to another must be made at a manhole or with an approved coupler.

**Bedding requirements**

The class, type of pipe and pipe bedding shall be indicated on the profile for each section of the sanitary sewer.

The class of pipe and the type of bedding shall be selected to suit loading and proposed construction conditions. Bedding as per OPSD 802.010, 013, and 014 for flexible pipe and OPSD 802.030, 031, 032, 033 and 034 for rigid pipe shall be used in all new construction and the class of pipe shall be selected to suit this bedding detail and characteristics.

Bedding and cover material to be granular A compacted to 95% SPMDD. Maximum depth of cover shall be in accordance with OPSD 806.06, 807.01, and 03.

**Testing requirements**

Infiltration/exfiltration testing will be carried out on all sanitary sewers, using either water or low air pressure in accordance with OPSS 410.07.15.02.

PVC sanitary sewers shall be subjected to a mandrel test. Maximum allowable deflection of the mainline sewer shall be 5%. A deformation gauge (PIG) test in accordance with OPSS 410.07.15.05 shall be carried out a minimum of thirty days after the sewer trench has been backfilled or prior to paving of roadways. It shall also be repeated prior to final acceptance and assumption of the sewer at the end of the maintenance period.

**2.4.2.7 Manholes**

Manholes shall be provided at each change in pipe alignment (vertical and horizontal), and at any change in pipe size or material and where the maximum spacing for a pipe run has been reached.

Generally, the maximum spacing for manholes shall be as follows:

- 120m for pipe sizes 200mm to 1050mm dia.
- 150m for pipe sizes 1200mm and larger.
The maximum change in direction from upstream to downstream pipes for pipe sizes 675mm and larger is 45°. For 675mm and larger size of pipes where the change in direction is greater than 45°, additional manholes shall be required to reduce the angle.

For manholes constructed at the end of a line that is to extended in the future, proper bulkheads shall be designed and the size of the bulkhead shall be specified on the engineering drawings.

Manholes may be constructed with either precast or poured in place concrete. The size of the manholes shall be based on the pipe size, the deflection angle of the pipes and the number of pipes at the junction manhole (see OPSD 701.021). When any dimension of a manhole differs from the standards, the manhole shall be individually designed and detailed.

Benching details for non-standard cases shall be detailed on the plan-profile sheets. Generally, the benching shall be brought to the spring line of the outlet pipe.

The obvert of the upstream pipe(s) shall generally not be lower than the obvert of the pipe on the downstream side of the manhole. If the cover over the sanitary main is being compromised because of this rule, then the design shall be on the basis of the 0.8 x dia. of the pipes are at the same elevation.

Suitable drops shall be provided across manholes to compensate for the loss in energy due to the change in flow velocity and for the difference in the depth of flow in the sewers. In order to reduce the amount of drop required, the Engineer shall try to restrict the change in velocity between the inlet and outlet pipes to less than 0.6 m/sec. The minimum drops across manholes shall be as follows:

<table>
<thead>
<tr>
<th>Alignment Change</th>
<th>Drop required</th>
</tr>
</thead>
<tbody>
<tr>
<td>0° grade of sewer</td>
<td>0.02m</td>
</tr>
<tr>
<td>1° to 45°</td>
<td>0.05m</td>
</tr>
</tbody>
</table>

The maximum drop allowed across a manhole is 0.60m calculated from the invert of the upstream pipe to the invert of the downstream pipe (in accordance with OPSD 1003.01). In junction manholes where there is a pipe entering the side of the manhole, the drop shall be calculated from the invert of the higher pipe to the top of the benching in the manhole. For drops greater than 0.60m a drop structure is required. Generally, the size of the drop pipe shall be one size smaller than the connecting sewer, minimum size of 200mm.

Safety gratings shall be installed in manholes that are greater than 5.0m in depth from the top of the manhole grate to the lowest invert.

Manhole frames and covers shall conform to OPSD 401.010 (closed cover).
2.4.2.8 Sanitary Private Drains

All sanitary sewer service connections shall be individual services. Shared sanitary private drains within the road allowance shall not be permitted. The services shall be located 1.5m to the right of the centre of a single detached residential lot. Locations for semi detached, street townhouse and quadroplex units shall be specified by the Engineer. Typical locations are shown in Appendix 6. Private drains for Blocks on a plan of subdivision (for commercial, institutional, industrial or multi-family block townhouses) shall be designed by the Engineer.

The connection to the mainline sewer shall be made with an approved prefabricated wye or an approved saddle for larger diameter sewers. For connections required to an existing sanitary mainline sewer, the main sewer shall be cored and an approved saddle used.

The minimum size for sanitary private drains shall be 150mm. Service connections for multiple family and commercial, industrial and institutional blocks shall be sized individually.

The sanitary private drain shall be extended 1m into the lot where the land is owned by the Developer or the City. A stake shall be placed at the end of the sanitary private drain, painted black, and extending 1.0m above grade.

The colour of the sanitary private drain shall be any colour except white. (White shall be used for storm private drains only).

The top of the sanitary private drain at the street line shall be minimum 2.2m below the centerline elevation of the road at that point.

In cases where dual (i.e. sanitary and storm) private drains are being installed, the sanitary private drain should be located such that the storm private drain is north or east of the sanitary private drain.

In cases where the main line sewer is a combined sewer, dual private drain connections shall be installed as specified in RSS 200.

Bedding for PVC private drains shall be granular A as per RSS 205. For sewers deeper than 3.7m, a riser shall be installed to an elevation of 2.75m below the final road elevation in accordance with RSS 201 (Sht.1). However, the riser shall be encased in 15 MPa wet concrete to only 1 metre above the main sewer.
2.4.3 Storm Sewer Design Criteria

2.4.3.1 General Requirements

Storm sewer systems in the City of Hamilton shall be designed and constructed in accordance with the City's Storm Drainage Policies and Criteria Manual.

Storm sewers shall be designed to service all the lands within the subdivision and any external drainage areas as may be required.

In the case where the outlet sewer is a combined sewer, the subdivision shall be designed for separate sanitary and storm sewers and an inter-connection shall be made at the limit of the subdivision. In all instances where the subdivision discharges into a combined sewer, the Engineer shall contact the City Planning and Development Department during the preliminary engineering stage to determine the constraints, if any, that may limit the discharge into the combined sewer system.

The Engineer shall submit storm sewer design sheets in accordance with the sample design sheets attached as Appendix 7a. An electronic copy of the spread sheet in Excel format shall be submitted to the City upon approval of the design.

2.4.3.2 Location

Storm sewers shall normally be constructed in a common trench with the sanitary sewer and shall be located parallel to and to the north and west of the sanitary sewer wherever possible, with 450mm separation between the outside walls of the two pipes.

However, the Engineer may deviate from this standard location if it can be shown that it is beneficial to the overall design.

2.4.3.3 Depth of Sewer

The cover of storm sewers shall be dependent on the storm sewer outlet. Generally, unless specified otherwise in the preliminary engineering report, the minimum depth of cover over the storm sewer shall be 2.75m below the centerline of the proposed road elevation, for storm sewers designed to provide standard urban servicing.

However, as in the case with the sanitary sewer design, the Engineer shall investigate the profile of the storm sewer to the upper reaches of the storm sewer catchment area, taking into consideration potential conflicts with sanitary sewer cross-overs and possible future road profiles along the route of the storm sewer.

If the profile of the storm sewer necessitates the placement of fill in excess of 0.6m on lands outside the subdivision, the Engineer shall be required to demonstrate that reasonable care has been taken to ensure that the design of the storm sewer has been optimized so as to minimize the impact of fill on those lands.
2.4.3.4 Design Flows

The City of Hamilton Storm Drainage Policies and Criteria Manual shall specify the preferred design procedure for the calculation of storm flows. Until the manual is finalized, design flows shall be determined using the Rational Method in the former municipalities of the Town of Ancaster, Town of Dundas, Town of Flamborough, Township of Glanbrook and the City of Stoney Creek, using the rainfall intensity curves established for those former municipalities.

The Modified Rational Method shall be used for obtaining design flows in the former municipality of the Corporation of the City of Hamilton, using the rainfall intensity curve established for use in the former City of Hamilton.

Under special circumstances, computer simulations shall be acceptable for estimating storm run-off provided the methodology and parameters used have been tested and deemed acceptable by the City.

Storm sewers in the former municipalities of the Town of Ancaster, Town of Dundas, Town of Flamborough, Township of Glanbrook and the City of Stoney Creek, shall be designed using the Rational Method as follows:

\[
Q = 0.0028 \times C \times i \times A
\]

and in the former Corporation of the City of Hamilton using the Modified Rational Method:

\[
Q = \alpha \times C \times i \times A
\]

where:

- \(Q\) = Flow in litres per second
- \(A\) = Drainage Area in hectares
- \(i\) = Intensity of rainfall in mm/hr
- \(C\) = Coefficient of Imperviousness
- \(\alpha\) = Modification factor (see Appendix 7b)

The Drainage Area \((A)\), shall be determined from the largest scale contour maps available for the area. The Engineer shall obtain from the City's Development Department, the overall storm drainage area maps that were used for the design of the trunk storm sewer systems. These maps shall then be refined based on existing development patterns that have evolved since the trunks were installed and on any additional detailed information available for the area.

Additional information regarding the basis of design is provided below:

The Intensity of Rainfall \((i)\), shall be calculated for each former municipality on the following basis:

< Ancaster: 2 year return frequency calculated by the formula:

\[
i = \frac{695.07}{(t + 6)^{0.81}}
\]
< Dundas: 5 year return frequency calculated by the formula:
\[ i = \frac{697.40}{(t + 5)^{0.764}} \]

< Flamborough: 5 year return frequency calculated by the formula:
\[ i = \frac{904}{(t + 5)^{0.788}} \]

< Glenbrook: 5 year return frequency calculated by the formula:
\[ i = \frac{904}{(t + 5)^{0.788}} \]

< Stoney Creek: 5 year return frequency storm calculated by the formula:
\[ i = \frac{2463.8}{(t + 16)} \]

< Hamilton: 50 year return frequency storm calculated by the formula:
\[ i = \frac{1034.8617}{t^{0.749}} \]

where \( t \) = time of concentration in minutes.

To determine the estimated flows in the former City of Hamilton, based on the above formula, The Engineer shall use the table attached as Appendix 7b, which shows the values of \( \alpha_{Ci} \) v/s time for different coefficients of imperviousness. This table shall be used for all drainage areas, regardless of shape.

The initial **time of concentration** (\( t \)), shall be as follows:

- Ancaster minimum of 15 minutes
- Dundas minimum of 10 minutes
- Flamborough minimum of 10 minutes
- Glenbrook minimum of 15 minutes
- Hamilton minimum of 10 minutes
- Stoney Creek minimum of 10 minutes

To calculate the initial external time of concentration for external lands that are scheduled for future development, the Engineer shall obtain the current neighbourhood secondary plans for the catchment area and determine the proposed street pattern and the most probable route of the storm sewer.

The top end of the storm sewer system shall then be assigned an initial time of concentration of 10 minutes and the time for conveyance of the storm flows shall be determined using an average velocity in the storm sewers system of 2 m/sec.

All external areas shall be designed on the basis of developed conditions unless otherwise advised by the City's Planning and Development Department.
Coefficients of Imperviousness \((C)\), shall be determined from the types of land uses within the drainage area. Recommended values are as follows:

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Recommended Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks</td>
<td>0.2</td>
</tr>
<tr>
<td>Low Density Residential</td>
<td>0.45 to 0.5</td>
</tr>
<tr>
<td>Medium Density Residential</td>
<td>0.65</td>
</tr>
<tr>
<td>High Density Residential</td>
<td>0.75</td>
</tr>
<tr>
<td>Institutional</td>
<td>0.75</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.75</td>
</tr>
<tr>
<td>Commercial</td>
<td>0.90</td>
</tr>
<tr>
<td>Paved Areas</td>
<td>0.9 to 1.00</td>
</tr>
</tbody>
</table>

For external areas, the Engineer shall assign coefficients of imperviousness based on the current neighbourhood secondary plans. If no secondary plans are available for future external areas, the Engineer shall, in consultation with the City Planning and Development Department, assign average coefficients of imperviousness that reflect a probable development pattern for the external area.

Sound engineering judgement shall always prevail in the actual design.

The Modification factor \((\alpha)\), for use in the Modified Rational Method in the former Corporation of the City of Hamilton, is the product of four coefficients:

a) coefficient of imperviousness
b) coefficient of distribution of rainfall
c) coefficient of retention, and
d) coefficient of retardation

The table in Appendix 7b shows the relationship of \(\alpha CI\) v/s time for various coefficients of imperviousness and shall be used as the basis of obtaining the design flows in the storm sewer.

2.4.3.5 Storm Sewer Pipe Design

Manning's formula shall be used to compute the capacity of storm sewers. The minimum design velocity for the storm sewer shall be 0.75 m/sec flowing full and maximum velocity shall not exceed 3.65 m/sec.

The minimum size of the storm sewer main shall be 300mm dia.

The storm sewer may be designed to flow at a maximum of about 95% full design
capacity of the pipe. Where there is a large external area with no secondary plan
determined at the time of design, the Engineer shall use sound engineering
judgement in selecting the pipe capacity.

**Pipe material acceptable for storm sewers**

<table>
<thead>
<tr>
<th>Pipe Material</th>
<th>Size</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC (Polyvinyl Chloride)</td>
<td>300mm and larger</td>
<td>Rubber adaptor or manhole stub sanded spigot end.</td>
</tr>
<tr>
<td>ASTM D3034 DR 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVC (Polyvinyl Chloride) Profile Pipe</td>
<td>300mm and larger</td>
<td>Rubber adaptor or manhole stub sanded spigot end.</td>
</tr>
<tr>
<td>CSA B182.4 and ASTM F794</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforced Concrete</td>
<td>300mm and larger</td>
<td></td>
</tr>
<tr>
<td>CSA A257.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitrified Clay Pipe</td>
<td>300mm and larger</td>
<td></td>
</tr>
<tr>
<td>CSA A60.1 and A60.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVC (Polyvinyl Chloride) CSA B.182.1 DR 28</td>
<td>150mm</td>
<td>For storm private drains (white).</td>
</tr>
<tr>
<td>PVC (Polyvinyl Chloride) ASTM D3034 DR 35</td>
<td>250mm</td>
<td>For catch basin leads.</td>
</tr>
</tbody>
</table>

Substitution of pipe material from the approved drawings must be approved by the City and Engineer prior to use.

Transition from one pipe material to another must be made at a manhole or with an approved coupler.

Storm private drains in the City of Hamilton shall be subject to the same criteria as sanitary private drains, as detailed in Section 2.4.2.8. unless otherwise approved by the City's Development Engineering Section.

The minimum size of storm private drains shall be 150 mm dia. All storm sewer service connections shall be individual services. Shared storm private drains within the road allowance shall not be permitted.

The services shall be located in the same trench as the sanitary private drain (i.e. 1.5m to the right of the centre of a single detached residential lot) with the storm private drain being located to the north or east of the sanitary private drain.

Locations for semi detached, street townhouse and quadroplex units shall be specified by the Engineer. Typical locations are shown in Appendix 6. Private drains for Blocks on a plan of subdivision (for commercial, institutional, industrial or multi-family block townhouses) shall be designed by the Engineer.

Storm private drains shall be **white** in colour to distinguish them from sanitary private drains, which can be any colour except white.
In cases where the storm sewer has less than 2.75m cover and sufficient cover cannot be achieved for the storm private drain at the street line to drain the weeping tiles of the dwellings by gravity, (or where weeping tile are not allowed to be discharged directly into the storm sewer), sump pumps shall be specified for each lot so affected. Sump pumps shall be allowed to discharge onto the ground a minimum of 0.6m beyond the foundation wall.

The Engineer shall contact Hamilton Hydro/Hydro One to determine the location of any hydro vaults and shall allow for storm drains to each hydro vault (if required) on the engineering drawings.

2.4.3.7 Manholes and Catch Basins

Manhole frames and covers shall conform to OPSD 401.010 (open cover).

Catch basin frames and covers shall conform to OPSD 400.020 for local and collector roads and OPSD 400.070 for arterial roads.

2.4.3.8 Roof water Leaders discharge

All single-detached and semi-detached dwellings shall have their roof water leaders discharged to the ground via splash pads. However, consideration shall be given for the connection of roof water leaders for small lots (10m frontage and less) to the storm sewer.

Roof water leaders from street townhouses shall be connected directly to the storm sewer unless the Developer provides an appropriate stormwater management study, prepared by a qualified Professional Engineer and the design is approved by the Manager of Development Engineering.
2.4.4 Watermain Design Criteria

2.4.4.1 General

All watermains within the City shall be installed in accordance with the current City Specifications. Information regarding existing pressures and flows at key nodes in the neighbourhood shall be made available to the Engineer by the City. A request for this information shall be made to the Senior Project Manager, Development Engineering, who shall provide the information in a timely fashion.

All developments, and phases of developments, shall be encouraged to provide two watermain feeds where practical. Generally, if there are more than 100 lots being serviced by one watermain feed, a second watermain feed shall be required. The watermain distribution layout shall be discussed with the City's Development Engineering Division prior to finalizing the engineering submission. Where two feeds are not practical (or cost prohibitive), the City may waive this requirement.

2.4.4.2 Location

Generally, the watermains shall be located in the pavement 1.0m from the edge of asphalt. Property line off-set for the watermain shall be as indicated in the standard road cross-section. For road allowances larger than 20m the Engineer shall discuss with the City's Development Engineering Division to determine the preferred location.

In all normal cases, the watermain should be located such that it has a minimum of 2.5m horizontal separation from the nearest sewer.

Under special conditions, where a significant portion of the watermain is in rock, or where congestion with other utilities negates the possibility of maintaining a 2.5m horizontal separation, the City Development Engineering Section should be consulted to obtain permission to install the watermain closer to the sewer. Under such conditions, the elevation of the crown of the sewer must be a minimum of 0.5m below the invert of the watermain.

Where this vertical separation cannot be obtained, the sewer shall be constructed of materials and joints that are equivalent to watermain standards of construction and shall be pressure tested in accordance with Section 2.4.4.12.

2.4.4.3 Depth of Cover

The minimum depth of cover for all new watermains shall be 1.6m measured from the top of the pipe to the centerline of the road elevation from urban road cross-sections. For rural cross-sections, where the watermain may be located near the roadside ditch, the design shall be reviewed to ensure that there is a minimum of 1.5m cover over the watermain. The maximum depth of cover allowed for existing or proposed watermains is 3.0m.
2.4.4.4 Sewer Conflicts and Crossings

Generally, the watermain shall cross above sewers with sufficient vertical separation to allow for proper bedding and structural support of the watermain, (150mm minimum).

When there is conflict with the elevation of the sewer and the watermain such that the watermain cannot pass over the sewer, then the watermain shall be designed such that it passes under the sewer subject to the following conditions:

a) There shall be a minimum vertical separation of 0.5m between the bottom of the sewer pipe and the top of the watermain,
b) The watermain shall be lowered below the sewer using vertical thrust blocks,
c) The length of the watermain pipe shall be centred at the point of crossing so that the joints are equidistant and as far as possible from the sewer, and
d) the sewer shall be adequately supported to prevent joint deflection and settling.

2.4.4.5 Hydrants

All hydrants shall be 3-way hydrants and shall be spaced approximately 150m apart on streets with low density development, and at 110m spacing on collector streets, high density residential streets and industrial streets. On cul-de-sacs, the fire hydrant shall be located within 75m of the dwelling lot furthest from the street entrance.

On rural roads hydrants shall be spaced at 150m. Hydrant connections only (with secondary valves) may be installed where the lands have not been developed.

Hydrants shall be located within the road allowance at the extension of the lot line between two lots to avoid potential conflicts with driveways. If the location of driveways has been determined in advance, the hydrant location shall be reviewed in conjunction with any driveway locations to ensure that conflicts do not occur.

All hydrants shall

- be in accordance with the approved watermain materials list
- be 3-way, two nozzles which are 180° to each other and parallel to the street and a 100mm pumper “STORZ” connection facing the street
- open counter-clockwise (left)
- have a 25mm top operating nut size
- be painted red (barrel, bonnet and hose nozzle caps) and the “STORZ” connection painted black
- be controlled by a secondary valve close-coupled to the hydrant
- be installed plumb in accordance with the City standard drawing RWS 600

If an extension is required to adjust the length of the barrel, it shall be placed between the lower section of the barrel and the boot connection.
2.4.4.6 Valves

The number of gate valves required shall be based on the layout of the development. At an intersection, the number of gate valves required is generally one less than the intersecting watermains, i.e. if there is a 4-way cross, 3 valves shall be installed. On long stretches of watermain without intersections, a valve should be installed for every 100 units serviced and shall be located on the projection of a lot line. At intersections, the valve shall be located at the projection of the intersecting street line.

All gate valves shall
- be in accordance with the approved watermain materials list
- open clockwise (right) in the Hamilton District
- open counter-clockwise (left) in the Ancaster, Dundas, Flamborough, Glanbrook and Stoney Creek Districts
- be installed in chambers if 400mm and larger
- have a 25mm operating nut size in the Hamilton District and 50mm in the Ancaster, Dundas, Flamborough, Glanbrook and Stoney Creek Districts

Chambers are not required for main line gate valves and tapping valves off mains smaller than 400mm diameter (even if located within the road pavement). All gate valves 400mm and larger and tapping valves off mains 400mm and greater shall be installed in a concrete chamber in conformity with current City standards. Air valves and blow-off valves shall be installed in a chamber, regardless of size.

Valve chambers shall contain a sump and drained by a 150mm dia. storm drain to the storm sewer, where possible. A Bibby Type B-4055 backwater valve or approved equivalent shall be installed on the storm drain. If there are no storm sewers or where the storm sewer is not deep enough to drain the valve chamber, a sump shall be installed in the bottom of the valve chamber.

The top of valve boxes and valve chamber covers shall be set flush with the finished grade. For chambers and valve boxes located in shoulders of roads, an asphalt paved shoulder shall be constructed in accordance with RHS 507.

2.4.4.7 Tapping Valves and Sleeves

Connection of the new watermain and the existing water distribution system shall be made using a tee and sleeve. In the event that the water distribution system cannot be taken out of service a tapping valve and tapping sleeve shall be utilized, subject to approval by the City.

Tapping valve and sleeve shall be in accordance with the approved watermain materials list.

2.4.4.8 Cul-de-sac and Dead end mains

Permanent cul-de-sacs shall provide for the looping of the watermain in accordance with detail shown in Appendix 8. It is preferred to locate a fire hydrant at the end of temporary dead end mains, however a 50mm blow-off is an approved alternate.
2.4.4.9 Pipe Material and Bedding

Hyprotec ductile iron, Class 52 or PVC pipe shall be used for watermains unless a geotechnical report is submitted indicating that the soils conditions are not conducive to corrosion of the pipe. The ten point scale as described in AWWA C105 shall be used to determine the corrosive nature of the soils. See Appendix 4

Pipe material acceptable for watermains

Ductile Iron with cement Mortar lining, Class 52 AWWA C151
100mm to 400mm For non-corrosive soil

Hyprotec Ductile Iron with Cement Mortar Lining, Class 52 AWWA C151
100mm to 400mm For corrosive and non corrosive soil

PVC (Polyvinyl Chloride)
CSA B137.3, DR-18 AWWA 900
For corrosive and non corrosive soil

Copper, Type K soft
20mm to 50mm For corrosive and non corrosive soil

For PVC mains a continuous #8 gauge TWU tracer wire must be supplied along the full length of the pipe to provide electrical continuity for purposes of locating the main and cathodic protection of metallic fittings in accordance with RHW Form 1600.

Substitution of pipe material from the approved drawings must be approved by the City and Engineer prior to use.

Transition from one pipe material to another must be made with an approved coupler.

Bedding requirements

Ductile Iron or Hyprotec Ductile Iron Granular A, RWS 500

PVC Granular A

Copper, Type K Soft Granular D, RWS 500

2.4.4.10 Thrust Blocks and Mechanical Joint Restrainers

All horizontal and vertical bends, tees and plugs shall be restrained with concrete thrust blocks in accordance with City Standard drawings.

Concrete for thrust blocks shall be 30 MPa laid to undisturbed ground. Where thrust blocks cannot be laid to undisturbed ground due to excessive sewer excavation or fill conditions, mechanical joint restrainers may be used in conjunction with concrete thrust blocks.
Any section of watermain that is not pressure tested against thrust blocks (e.g. connection pieces), shall be required to use mechanical joint restrainers at the tee connections in addition to the concrete thrust block.

2.4.4.11 Private Water Services

Private water services for single detached residential lots shall be a minimum of 20mm dia, Type K copper pipe, located 1m to the left of the centerline of the lot. Water services shall be separated from sanitary and storm private drains by a minimum of 2.5m.

All private water services shall be connected to a main stop at the watermain and shall be terminated at the street line with a curb stop and box.

Water services shall be installed perpendicular to the watermain, where possible.

2.4.4.12 Charging and Testing of New Watermains

All new watermains shall be tested prior to any connection being made to existing watermains, using temporary caps or plugs.

All connection points between the new watermain and the existing water distribution system must be kept physically separated until the watermain has successfully passed bacteriological tests.

Temporary charging of new watermains

A reduced pressure zone backflow prevent is required on the temporary supply line used for filling and flushing of all watermains. The following backflow preventer valves are approved:

- Watts 009 16mm to 50mm
- Watts 909 75mm to 200mm
- Hersey FRPII 19mm to 50mm
- Hersey 6CM 75mm to 100mm

Testing of new watermains

New watermains shall be tested in the following sequence

a. pressure and leakage test
b. swabbing
c. disinfection and bacteriological testing

to the satisfaction of the City prior to connection to existing watermains.

Pressure and Leakage Testing

Prior to the pressure and leakage test, the contractor may elect to swab the main to assist in the removal of air pockets.
The test pressure shall not be less than 1035 KPa (150 psi) for ductile iron and PVC pipe.

The leakage allowance shall be less than 1.85 L/mm of pipe diameter/km of pipe/day within the shortest valved section. The duration of the pressure test shall not be less than two (2) hours.

**Swabbing**

All new watermains shall be cleaned by passing a minimum of three (3) polyethylene swabs through the pipe. Additional swabbing will be required if the water in not clear after the third swab.

**Disinfection and Bacteriological Testing**

After pressure and leakage testing, and swabbing of the new main, disinfection of the new main shall proceed. Sodium hypochlorite or other approved chlorine compound in sufficient quantity to obtain an initial free chlorine residual of minimum 50 mg/L and a minimum of 25 mg/L 24 hours after the introduction into the pipe.

After successfully disinfection, the main shall be flushed. Chlorinated water may be discharged into the sanitary sewer system. In rural areas where no sanitary sewers are available, chlorinated water must be dechlorinated and tested prior to discharging into a ditch/watercourse.

After final flushing and a “sitting period” of 18 hours, water samples for bacteriological testing will be collected by the City and submitted for testing by the City Laboratory at Woodward Avenue. Samples will only be accepted by the Lab Monday through Friday from 8:30 a.m. to 3:30 p.m.

Samples shall be collected at the end of each branch or stub, at 350m intervals, and a minimum of two (2) samples taken for each main. When the samples prove satisfactory, the mains may be placed in service and connections to the existing water distribution system can be arranged.

The Engineer shall co-ordinate with the City to connect to the water distribution system. A minimum of 48 hours advanced notice to all affected properties prior to the disruption of the water distribution system.
2.4.5 Road works Design Criteria

2.4.5.1 Geometric Standards

The geometric design of municipal roads in the City of Hamilton shall conform generally with the standards set out in the latest edition of the "TAC" Manual on Geometric Design Guidelines, September 1999.

The following road classifications shall apply:

ARTERIAL ROAD describes a road, which functions as a strategic link in the overall road network of the City. Arterial roads carry relatively large volumes of short and long distance traffic in and through the City and provide some access to abutting properties.

COLLECTOR ROAD describes a road whose function is to provide a connecting road link between Arterial and Local roads. Collector roads generally carry lower traffic volumes than Arterial roads and may provide direct access to abutting properties.

LOCAL ROAD provides direct access to abutting properties and carries traffic predominantly of a local nature.

Classification of roads as major or minor collectors and local residential roads shall be identified in the City's Official Plan or the Secondary Plan for each Neighbourhood. Where no Secondary Plan has been prepared, the Director of Development shall determine the classification of the roadways, based on the function of the proposed roadway within the Neighbourhood as described above.

All roads within the urban boundary of the City of Hamilton shall be designed and constructed to urban standards with full municipal services: i.e. concrete curbs with subdrains, asphalt on granular pavement, concrete sidewalks, catchbasins, storm sewers and street lighting.
A summary of some of the design criteria is given below:

<table>
<thead>
<tr>
<th>Geometric Detail</th>
<th>Local Road</th>
<th>Minor Collector</th>
<th>Major Collector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban Residential</td>
<td>Urban Residential</td>
<td>Urban Residential</td>
</tr>
<tr>
<td>Min. ROW (m)</td>
<td>18</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>Design Speed (km/hr)</td>
<td>50</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Posted Speed (km/hr)</td>
<td>50</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Min. Visibility Curves in Sag (K)</td>
<td>12</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Min. Visibility Curves on Crests (K)</td>
<td>8</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Min. Horizontal centreline Road Radius (m) **</td>
<td>90</td>
<td>95</td>
<td>160</td>
</tr>
<tr>
<td>Min. curb radius at intersection (m)</td>
<td>9</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Pavement asphalt Width (m)</td>
<td>Residential</td>
<td>8.0</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>8.0</td>
<td>11.0</td>
<td></td>
</tr>
<tr>
<td>Subgrade cross-fall</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Pavement cross-fall</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Min. Grade (%)</td>
<td>0.5% with curb/gutter</td>
<td>0.5% with curb/gutter</td>
<td>0.5% with curb/gutter</td>
</tr>
<tr>
<td>Max. Grade (%)</td>
<td>6.0%</td>
<td>6.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Max. Grade for Through Roads at Intersections (%)</td>
<td>3.5%</td>
<td>3.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Max. Grade at Stop Roads at Intersections (%)</td>
<td>2.5%</td>
<td>2.5%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Intersection Angle (degrees)</td>
<td>80 to 90</td>
<td>80 to 90</td>
<td>85 to 90</td>
</tr>
<tr>
<td>Min. Tangent Length approaching intersections</td>
<td>20</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Cul-de-sacs ROW</td>
<td>18.0 m Radius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement</td>
<td>13.0m Radius</td>
<td>18.0 m Radius</td>
<td>13.0m Radius</td>
</tr>
<tr>
<td>Geometric Detail</td>
<td>Local Road Rural Residential</td>
<td>Minor Collector Rural Residential</td>
<td>Major Collector Rural Residential</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Min. ROW (m)</td>
<td>20</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>Design Speed (km/hr)</td>
<td>50</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>Posted Speed (km/hr)</td>
<td>50</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Min. Visibility Curves in Sag (K)</td>
<td>12</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Min. Visibility Curves on Crests (K)</td>
<td>130</td>
<td>175</td>
<td>250</td>
</tr>
<tr>
<td>Min. Horizontal centreline Road Radius (m) **</td>
<td>100</td>
<td>150</td>
<td>2000</td>
</tr>
<tr>
<td>** except at 90° corners at crescents and courts.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum edge of pavement radius at intersection (m)</td>
<td>9</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Pavement asphalt Width (m) **</td>
<td>6.7 plus shoulders</td>
<td>6.7 plus shoulders</td>
<td>9.0 plus shoulders</td>
</tr>
<tr>
<td>** Rural roads to be designed with roadside ditches for drainage. No curb and gutter required.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subgrade cross-fall (%)</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Pavement cross-fall (%)</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Min. Grade (%)</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Max. Grade (%)</td>
<td>6.0%</td>
<td>6.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Max. Grade for Through Roads at Intersections (%)</td>
<td>3.5%</td>
<td>3.0%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Max. Grade at Stop Roads at Intersections (%)</td>
<td>2.5%</td>
<td>2.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Intersection Angle (degrees)</td>
<td>80 to 90</td>
<td>80 to 90</td>
<td>85 to 90</td>
</tr>
<tr>
<td>Min. Tangent Length approaching intersections</td>
<td>20</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Cul-de-sacs</td>
<td>18.0 m Radius</td>
<td>13.0 m Radius</td>
<td></td>
</tr>
<tr>
<td>Geometric Detail</td>
<td>Local Road</td>
<td>Minor Collector</td>
<td>Major Collector</td>
</tr>
<tr>
<td>------------------</td>
<td>------------</td>
<td>-----------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>Industrial/Commercial</td>
<td>Industrial/Commercial</td>
<td>Industrial/Commercial</td>
</tr>
<tr>
<td>Min. ROW (m)</td>
<td>20</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Design Speed (km/hr)</td>
<td>50</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Posted Speed (km/hr)</td>
<td>50</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Min. Visibility Curves in Sag (K)</td>
<td>12</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Min. Visibility Curves on Crests (K)</td>
<td>8</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Min. Horizontal centreline Road Radius (m) **</td>
<td>110</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>** except at 90° corners at crescents and courts.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement asphalt Width (m)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial</td>
<td>9.25</td>
<td>11.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Subgrade cross-fall</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Pavement cross-fall</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Min. Grade (%)</td>
<td>0.5% with curb/gutter</td>
<td>0.5% with curb/gutter</td>
<td>0.5% with curb/gutter</td>
</tr>
<tr>
<td>Max. Grade (%)</td>
<td>6.0%</td>
<td>6.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Max. Grade for Through Roads at Intersections (%)</td>
<td>3.5%</td>
<td>3.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Max. Grade at Stop Roads at Intersections (%)</td>
<td>2.0%</td>
<td>2.0%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Intersection Angle (degrees)</td>
<td>80 to 90</td>
<td>80 to 90</td>
<td>85 to 90</td>
</tr>
<tr>
<td>Cul-de-sacs ROW</td>
<td>18.0 m Radius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement</td>
<td>13.0 m Radius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sidewalks</td>
<td>not required</td>
<td>not required</td>
<td></td>
</tr>
</tbody>
</table>

Horizontal and vertical alignment shall be in conformity to the geometric standards outlined above. Vertical curves are required for changes in grade greater than 2.0% for local roads and minor collector roads and 1.0% for major collector roads (except
at the crown of the road through intersections and at the point where the crossfall of the through road meets with the grade of the intersecting stop street.). The minimum length of each grade shall be 6 metres. Cul-de-sacs shall be designed such that there is a minimum 0.5% gutter grade around the longest curb.

For intersection grading, the 2% pavement cross-fall on the through roadway shall be maintained through the intersection. The crown and cross-fall on the intersecting roadway shall match the projected gutter line pavement elevation of the through roadway. For intersections where both roads are either arterial or collector roads, a minimum cross-fall and crown shall be maintained on all approaches.

The minimum curb return radii at intersections shall be 9m. Larger radii may be required to accommodate transit and truck traffic at selected intersections.

The Engineer shall design road grades taking into consideration the existing (and/or proposed) grades of adjoining properties, lot grading patterns, existing and/or proposed sewer profiles, major overland flow routes and elevations of intersecting streets, etc.

As a requirement of draft plan approval, the Engineer may be required to incorporate traffic-calming methods in the design of the roadways. These shall be discussed on an individual basis with the City Planning and Development Department prior to completing the final engineering drawings.

**2.4.5.2 Pavement Design**

The following table summarizes the minimum requirements for pavement structure for different road classifications:

<table>
<thead>
<tr>
<th>Road Classification</th>
<th>Top Course</th>
<th>Binder Course</th>
<th>Granular &quot;A&quot;</th>
<th>Granular &quot;B&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asphalt</td>
<td>Asphalt</td>
<td>(Type II 100% crushed aggregate)</td>
<td></td>
</tr>
<tr>
<td>Residential Roads</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban Local Residential</td>
<td>40mm HM-3</td>
<td>80mm HL-8</td>
<td>150mm</td>
<td>300mm</td>
</tr>
<tr>
<td>Urban Collector Residential (Minor and Major)</td>
<td>40mm HM-3</td>
<td>100mm HL-8</td>
<td>150mm</td>
<td>300mm</td>
</tr>
<tr>
<td>Commercial/Industrial Roads</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban Local Commercial/Industrial</td>
<td>40mm HM-3</td>
<td>120mm HL-8</td>
<td>150mm</td>
<td>375mm</td>
</tr>
<tr>
<td>Urban Collector Commercial/Industrial (Major and Minor)</td>
<td>40mm HM-3(HD)</td>
<td>120mm HL-8(HS)</td>
<td>150mm</td>
<td>375mm</td>
</tr>
<tr>
<td>Rural Roads</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Local Residential</td>
<td>40mm HM-3</td>
<td>80mm HL-8</td>
<td>150mm</td>
<td>300mm</td>
</tr>
<tr>
<td>Rural Collector Residential (Major and Minor)</td>
<td>40mm HM-3</td>
<td>100mm HL-8</td>
<td>150mm</td>
<td>300mm</td>
</tr>
</tbody>
</table>
All asphalt mixes shall be in conformity with the latest City of Hamilton Specifications Form 1300.

On roadways where underground services have been installed, the surface course asphalt shall not be placed immediately after the binder course asphalt.

The final asphalt course on any roadway shall not be placed until

a) written approval by the Engineer is received; and
b) a minimum of one year has passed after the placement of the binder course asphalt; and

c) at least 80% of the dwellings in the land are constructed; and

d) deteriorated base asphalt and/or granular base and concrete curbs and gutters have been repaired and/or replaced to the satisfaction of the Engineer; and

e) the base course shall be power swept and/or power flushed and free of mud and debris.

When the surface course is to be placed on a previously laid binder course a tack coat shall be applied immediately prior to placing the surface course asphalt.

_Generally, surface course asphalt shall not be placed before the first day of May or later than the first day of November. Any deviation of this date shall require the prior approval of the Manager of Development Engineering._

2.4.5.3 Adjustments of all appurtenances

When the surface course asphalt is not placed immediately after the binder course asphalt, all adjustments of manholes, catch basins, and valve chambers shall be set to the binder course asphalt and re-adjusted when the surface course asphalt is placed.

The final adjustment of all manholes, catch basins, water chambers shall be done using one continuous pour of 30 MPa concrete from the underside of the frame to 150mm below the top of the pre-cast structure on the outside. The minimum concrete thickness shall be 150mm.

Precast adjustment units may be used for temporary adjustments only. Prior to the placement of the final surface course asphalt, all temporary adjustment units shall be removed.

2.4.5.4 Curbs and gutters and subdrains

All roadways shall be constructed with curb and gutter (OPSD 600.040) in accordance with the current City Standards. Two stage curb and gutter construction (OPSD 600.070) is allowed.

In the event that weather conditions do not permit concrete curb and gutter construction, a wider paved roadway will be permitted. The width of the roadway
shall be extended a minimum of 0.5m on each side. The cross section of the widened pavement shall conform to the cross section of the roadway. Curb and gutters shall be constructed within one year of the completion of the binder course asphalt. A minimum of 1.0m of the paved roadway shall be removed upon installation of the curb and gutter (i.e. minimum 0.5m asphalt repair adjacent to curb and gutter) and binder asphalt placed to the specified thickness.

Curb depressions are required at every driveway and at each intersection for wheelchair ramps.

Subdrains shall be installed continuously below the curb unless soil conditions warrant otherwise. Any request for reduced subdrain installation shall be accompanied with a geotechnical report outlining the soil conditions and what impact the reduction of subdrains shall have on the life of the pavement.

**Generally, Concrete curbs and gutters shall not be placed after November 15th. Any deviation of this date shall require the prior approval of the Manager of Development Engineering.**

### 2.4.5.5 Sidewalks

Concrete sidewalks, 1.5m wide, shall be installed as follows:

**Arterial Roads:**
- on both sides of the road located 1.0m from the street line where
  - there is no direct individual access from freehold units onto the road
  - there may be a joint access from a lay-bye (or service road parallel to the arterial)
  - there is access from a block multi-family residential development, and
  - there is access from a commercial or industrial development block.

Where there is direct access onto the arterial road from individual residential lots, sidewalks shall be located so as to provide a 3.0m wide boulevard between the back of the curb and the sidewalk.

**Minor and Major Collectors**
- both sides of the street, located 1.75m from the back of curb

**Local urban roads**
- one side of the street, located 1.75m from the back of curb

**Cul-de-sacs and Crescents**

For the purposes of the City's sidewalk policy, a cul-de-sac is defined as a street having only one access to another street and a crescent is defined as having two accesses to the same street. If a crescent has access to a second street, it shall be classified as a local road.
No sidewalks are required for cul-de-sacs which have 30 units or less or on crescents which have 60 units or less. If a development is serviced by a combination of cul-de-sacs off crescents the maximum number of units allowed on the combination is 110 before sidewalks are required on one side of the crescent. The corner entrance lots are not included in determining the number of units.

If the cul-de-sac or crescent connects to a pedestrian link or walkway to external community facilities such as schools, parks/open space, other residential areas, shopping areas or recreational areas, a sidewalk on one side of the street shall be required connecting to the pedestrian link/walkway.

*Industrial Roads*

Sidewalks are generally not required along internal roads for industrial subdivisions or developments.

*There shall be no deviation from this policy.*

On continuation of existing streets where sidewalks have already been installed at a different location, the City's Development Engineering Division shall be consulted to determine the offset from the curb.

*Generally, concrete sidewalks shall not be placed after November 15th. Any deviation of this date shall require the prior approval of the Manager of Development Engineering.*

2.4.5.6 Roadway Cross Sections

Local urban residential streets shall have a 18m right-of-way, which provides for a 8.0m roadway

Minor collector roads shall have a 20m right-of-way, which provides for a 8.0m roadway

Major collector roads shall have a 26m right-of-way, which provides for a 11 m roadway

Typical road cross-sections are provided in Appendix 9.

2.4.5.7 Driveways

Granular driveways are required to be constructed by the Developer.

Driveway curb depressions shall be built to accommodate the driveway width plus 0.45m on each side of the driveway measured at the gutter line. The maximum width of the curb depression, measured at the gutter line, shall be 4.5m for a single driveway and 7.0m for a double driveway.
The maximum permissible design grade for any driveway shall be 7.0%. The minimum driveway grade shall be 2.0%.

Driveway entrances to multi-family blocks and commercial entrances shall be in accordance with City access permit requirements and shall be asphalt as per City Standard Drawings. There shall be a depressed curb along the road, across the entire width of the approach together with concrete curb returns along the sides of the asphalt approach. The minimum radius for the curb returns shall be 6.0m.

On arterial roads that have not been constructed to the proper urban cross-section at the time of approval of the Engineering drawings, there shall be a provision for the installation of a driveway culvert at the roadside ditch. The minimum length of CSP driveway culvert shall be 6.0m for single driveways and 9.0m for double driveways and the minimum diameter shall be 450mm.

2.4.5.8 Boulevards

All boulevards areas will be sodded using No. 1 nursery sod including 150mm of topsoil. 2% cross fall shall be maintained on boulevards.

2.4.5.9 Hydro and Street lighting

The Developer is responsible for arranging with Hamilton Hydro (or Hydro One, depending on the jurisdiction) for the installation of underground hydro and Street lighting on all streets within the plan of subdivision. The Developer shall enter into a separate agreement with Hamilton Hydro (or Hydro One) for the design and installation of these works.

Securities for the installation of street lighting shall be lodged with the City of Hamilton. Hamilton Hydro and Hydro One collect their own securities for payment of the underground hydro portion of the works.

Hamilton Hydro and Hydro One arrange for the installation of the works. However, rock excavation is not included in the normal installation provided by Hamilton Hydro. If storm drains for transformer vaults are required, they shall be paid for by Hamilton Hydro, but are usually installed by the Developer’s Contractor.

The Engineer shall, therefore, make allowance in the construction tender for rock excavation for hydro and utilities, street lighting poles, and storm drains for transformer vaults in rock. The Developer shall pay for these items.

The Engineer shall also allow in the tender a separate item for the installation of storm drains for transformer vaults. This price shall be submitted directly to Hamilton Hydro for payment.

In situations where the City cost-shares in the installation of street lighting on that roadway, Hamilton Hydro (or Hydro One) shall invoice the Developer for the cost of the street lighting and the City shall pay the Developer in accordance with the cost sharing arrangement in the subdivision agreement.
Should the Developer elect to install decorative street lighting it shall be in accordance with the following requirements:

Ancaster, Dundas and Flamborough Districts
• decorative street light poles, octagonal, etched, midnight lace, 4.57m high, direct buried; Stress-Crete #KCC-15-G-E10-CSA
• decorative light fixture, 100W HPS, 120V ballast, integral photocell, decorative cover; Powerlite “Georgian” #GRP10S4YPC2MSW1C-CSA-DC

Glanbrook, Hamilton and Stoney Creek Districts
• decorative street light pole, octagonal, etched, midnight lace, 4.57m high (plus 1.2m direct buried); Stress-Crete #KCC-15G-E10-CSA
• decorative light fixture, 100W or 70W HPS, 120V ballast, integral photocell; King Luminaire #K118-EAR-100HPS or #K118-EAR-70HPS

2.4.5.10 Traffic Signs and Street Name Signs

The City of Hamilton shall install all traffic signs and street name signs on all roads within the City. The Developer will be required to pay for the signs in the subdivision agreement.

2.4.5.11 Catch basins and Connections

Catch basins shall be designed to take into consideration the lot areas draining on to the roadway, the pavement widths, road grades and intersection drainage.

Catch basins shall be generally located upstream of any pedestrian sidewalk crossings, and if possible, should be avoided in driveway curb depressions. Double catch basins shall be installed at all the low points in a road. However, at intersections where the cross-fall of one road creates a low point on the other intersecting minor road, the back-fall shall be provided on the minor road to the end of the curb return radius to facilitate proper drainage of the intersection. Single catchbasins only shall be required at the end of the curb return for drainage in this case.

Catch basins spacing shall be determined as follows, unless prescribed otherwise by a detailed stormwater management design:

<table>
<thead>
<tr>
<th>Pavement Width</th>
<th>Maximum Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5m or less</td>
<td>90 m</td>
</tr>
<tr>
<td>9m to 11m</td>
<td>75m</td>
</tr>
<tr>
<td>11.5m or greater</td>
<td>60m</td>
</tr>
</tbody>
</table>

Where the road grades are between 3% and 5% the maximum spacing shall be reduced by 15% and for road grades between 5% and 6%, the maximum spacing shall be reduced by 30%.
Catch basins connections shall be 250mm dia. PVC DR 35 pipe in accordance with City Standard Drawings. All road catch basins shall be installed with goss traps in accordance with City Standard Drawings.

Catch basin frames and covers shall conform to OPSD 400.020 for local and collector roads and OPSD 400.070 for arterial roads.

For rear lot catch basins, the minimum size of the connection shall be 250mm and the minimum grade of 1.0%. If minimum grade cannot be maintained, the Engineer shall justify pipe design to the satisfaction of the Manager of Development Engineering.

The frame and cover for rear lot catch basins shall be “pyramidal” or “dome” type. Goss trap connection will not be required on rear lot catch basins.

### 2.4.5.12 Cul-de-Sacs

Permanent cul-de-sac shall be constructed in accordance with details shown in Appendix 10, providing for a 13m asphalt turning circle. The design road grade on the cul-de-sac shall be such that the drainage is directed away from the end of the cul-de-sac and towards the beginning of the bulb area.

### 2.4.5.13 Temporary Turning Circles

Temporary turning circles shall be considered whenever a road is to be continued in the future and the distance from the temporary dead-end to the centerline of the nearest intersection is greater than 45 m.

Details of the temporary turning circles shall be submitted with the engineering submission and shall include a min. 13m radius asphalt turning circle. A typical detail is included in Appendix 10.

### 2.4.5.14 Temporary Roads and Emergency Access requirements

The maximum number of dwelling units that will be allowed to be serviced with one road access is 100. If the proposed plan of subdivision is for more than 100 dwelling units (including potential units in multi-residential blocks), then a temporary road providing secondary access shall be provided to the satisfaction of the City.

Details of a temporary road access and an emergency access are shown in Appendix 10.

### 2.4.5.15 Street Trees

Generally, the Developer is required to plant one tree along the frontage of each lot and an additional two trees along the flankage of each corner lot within the plan of subdivision.

For reverse fronting lots, street trees shall also be provided in the boulevard at the
rear of the lots at the same spacing interval required for the frontage. Species of the boulevard trees shall be in accordance with the details provided in Appendix 10, subject to approval of the City’s Manager of Forestry as part of the first engineering submission.

### 2.4.5.16 Fencing

Where fencing is required adjacent to City owned properties, the Developer shall construct a 1.5m high chain link fence. The fence shall be installed so that the fence posts are located approx. 100mm within City owned property and shall be in accordance with OPSD 972.130 with black vinyl mesh and black posts with top rail and a mesh size of 50mm.

Wood privacy fencing shall generally be required where:
- residential lands abut commercial or industrial lands, and
- residential lands with reverse frontages on arterial roads

Wood privacy fencing shall be provided as per detail in Appendix 10.

### 2.4.5.17 Walkways

Public walkways shall be identified at the time of draft plan of subdivision and shall be constructed within the limits of the project by the developer. The minimum width of public walkways shall be 6.0m.

Walkways shall consist of a 1.5m concrete sidewalk centered in the walkway right of way. All walkways shall have a 1.5m high chain link fence along each property line in accordance with the detail drawing in Appendix 10. Remaining portions between the sidewalk and fence shall be sodded.

Bollards shall be installed at each end of the public walkway as per City standards to discourage vehicular traffic. See Appendix 10 for details.

### 2.4.5.18 Parklands

Parklands shall be fine graded in accordance with the approved grading plan and covered with a minimum of 150mm topsoil and seeded. Parklands shall be graded and seeded within two seeding seasons after the completion of the binder course asphalt road adjacent to the parklands.

The provision of service connections (water, sanitary and storm) may be required for the parklands at the discretion of the City.

### 2.4.5.19 Municipal Consent (MC) Procedures

The City of Hamilton MC procedure for new subdivision is as follows:

1. Engineer prepares and submits 1st engineering submission to City of Hamilton (Development Engineering) for review
All utility companies for information.

2. City of Hamilton (Development engineering) reviews the drawings and sends the comments back to the consultant.

3. Engineer completes and sends 2nd submission to the City and Hydro.

4. City reviews drawings.

5. Concurrently, Hydro prepares their design and circulates to all utility companies.

6. Utility companies prepare their designs in consultation with the Engineer.

7. Utility (including Hydro) companies send utility designs along with 2 copies of their MC application to the Engineer.

8. Engineer reviews utility design for conflicts, shows street furniture on lot grading plan and submits final lot grading design and 2 copies of all MC applications to the City (Development Engineering) for review or approval. Engineer has to include a statement of conformance of utility design.

9. City reviews lot grading plan. If additional revision(s) are required, the Engineer must contact the utility companies to work out their designs.

10. Additional submissions as required.

11. Development engineering forwards 2 copies of all the MC forms to the City’s utility co-ordinator along with the approval of their locations.

12. City’s utility co-ordinator returns approved MCs to appropriate utility companies.

13. All utility companies must be represented at the pre-construction meeting unless the utility company acknowledges (in writing) that its attendance is not warranted.

14. Road construction may not proceed until such time as all the MCs have been approved.

15. Each of the drawings attached for the MC has to be signed off by the Engineer indicating that all conflicts have been noted and eliminated.

16. The following note, signed and dated by the Engineer, shall be present on all development related utility drawings submitted for MC approval:

"This certifies that we have reviewed the drawings and the proposed utility locations are in accordance with City of Hamilton Standards. There are no conflicts.

__________________________ _______________________
Engineer Date

2.4.5.20 Asphalt Overlays on Existing Roads

If road cuts are required on existing roadways for construction of underground services, the Developer will be required to provide an asphalt overlay to the satisfaction of the City.

Generally, if there are more than two service trenches perpendicular to the roadway, at not more than 15m spacing, then the entire length of the roadway shall be overlaid from 1m past the first cut to 1m past the last cut.

If a service trench is required for a service parallel to the road, then the entire road shall be overlaid from 1m past the start of the service trench to 1m past the end of the service trench. If the service being installed is offset from the centerline of the road such that the service trench affects only a portion of the road, then the City...
may, at its discretion, allow half the road to be overlaid. For extra wide roads, the minimum asphalt overlay shall be one lane width.
2.4.6 **Erosion and Sedimentation Control**

A plan shall be prepared at the design stage incorporating the requirements for erosion and sedimentation in accordance with *Keeping Soil on Construction Sites*, HRCA (April 1994).

It is recognized that topsoil and other vegetation shall be removed from the site to accommodate grading, construction of sanitary and storm sewers, watermains, and other municipal services. The resulting areas of stripped ground will require sedimentation control measures to prevent silt from reaching the receiving storm sewer and downstream watercourses. The following minimum measures will be implemented during the construction phase of the development:

a) silt traps in the form of single filter cloth barriers shall be installed along the site boundaries that are susceptible to siltation;

b) temporary vehicle tracking controls to be constructed at all points of site access;

c) sediment traps consisting of filter cloth barriers shall be installed at all rear yard catchbasins. For roadway catchbasins, the filter cloth shall be folded in half, hung across the outlet pipe and weighed down with rebar;

d) if building activity does not commence within 45 days after the construction is completed, arrangements shall be made to seed any stripped areas and topsoil stockpiles that are not covered by vegetation and maintain them until ground cover is established;

e) maintenance of all siltation control measures will be required to prevent them from being clogged including replacement of filter cloth as required.

Sedimentation control measures shall be kept in place until satisfactory ground cover has been established and all building activity has been completed.
2.4.7 Easements

The Developer shall provide all easements that are required for the installation of municipal sanitary sewer mains, storm sewer mains, storm outlets, or watermains.

As a general principle, the City shall discourage the use of any easements where other feasible alternatives exist.

The minimum easement width required is:

a) 9 metres for one sewer (sewer centred on the easement)

b) 12 metres for dual sewer installation

c) 6 metres for a watermain (watermain centred on the easement)

d) 10 metres for one sewer with a watermain (3m easement limit to watermain, 2.5m clearance between watermain and sewer and 4.5m sewer to easement)

e) 12 metres for dual sewer installation with a watermain.

The above easement widths are minimum requirements and may be increased depending on the depth and size of the pipes within the easement and/or soil conditions, topography or operational needs.

Where special circumstances warrant, exceptions to reduce minimum easement requirements may be considered during pre-engineering submissions. Requests to reduce these requirements will be considered by the City's Manager of Development Engineering and the Department of Public Works.

The City shall not require any easements for private catch basin connections or private sewers and watermains.
2.5 City of Hamilton Lot Grading Policy, Criteria and Standards

Lot grading for single detached and semi-detached lots created through development applications in the City of Hamilton shall be subject to the following policy:

2.5.1 Policy

< Security for lot grading under subdivision agreements will be administered according to the following procedure:

Subdivision agreements will show a line item for:

(i) Pre-grading of lots
Security for pre-grading will be collected through the City’s subdivision agreement based on $1,000 per lot created by the plan and will be released following receipt of a grading certificate from a the developer's consulting engineer certifying that pre-grading has been completed.

(ii) Final lot grading
Security for final lot grading will be collected in two stages:

First Stage: A lump sum deposit will be collected through the City’s subdivision agreement to ensure completion of final lot grading and sodding should a problem arise with the overall grading in a development which cannot be rectified by modification to any single lot within that development.

Security amounts for final lot grading will be based on a sliding scale according to the size of the development as follows:

- $10,000 for plans up to 25 lots
- $15,000 for plans over 25 lots up to 50 lots
- $20,000 for plans over 50 lots up to 100 lots
- $25,000 for plans over 100 lots

The security held by the City under the subdivision agreement for final lot grading will be released upon acceptance of grading certificates by the City for all lots within a plan of subdivision.

Second Stage: A cash security deposit of $1,000 will be collected as a condition of building permit application from the owner of each lot within a development. The security deposit will be retained by the Director of Building & Licensing to ensure completion of final lot grading and sodding and will be released upon the City’s acceptance of a final lot grading certificate in accordance with the approved plot plan.

Acceptable Lot Grading

Lot grading shall be acceptable to the City if:
i) no portion of any side swale has a grade of less than 1.5%, unless mitigation measures have been put into place

ii) the average grade from the high point is not less than 1.8%

iii) the “as-built” grading does not impede the intent of the approved overall grading plan. Deviation in excess of 200mm at lot corners will be justified on the final grading certificate

iv) no portion of any backyard has a finished grade of less than 1.0%

v) the lot has been fully sodded, which includes the rear and side yards as well as the front yard, except for the area designated as a driveway.

< The subdivision agreement shall remain on title to the lots and blocks within a development in order to ensure that the Developer and subsequent owners of the lots and blocks within a development shall not be released from the restrictive covenants regarding discharge of roof leaders onto the ground.

2.5.2 Design Criteria

Design Criteria for grading lots with single detached and semi-detached housing in new developments within the City of Hamilton are as follows:

a) “Required backyard” shall mean the lesser of the distance regulated by the Zoning By-law or 6.0 metres.

b) The maximum slope in the backyard adjacent to the building for a distance equal to the required backyard shall be 5% except as set out in Items (c), (d) and (f).

c) The 5% restriction shall not apply to the sides of a swale along the sides or back of a lot, providing the total width of a swale does not exceed one (1) metre on each lot.

d) Where the 5% restriction on the backyard’s grades results in elevation differences between adjacent properties, retaining wall shall be constructed along the sides and back of the lot.

e) Generally, slopes shall be placed on the lower lot, whereas retaining walls shall be placed on the higher lands.

f) The 5% restriction does not preclude retaining walls in the required backyards providing the terraces are maintained to the 5% grade as set out in Item (b). The intention of this provision is to provide for flexibility of house construction.

g) Guards for retaining walls shall be designed and constructed in accordance with the requirements for exterior guards as contained in the Ontario Building Code.

h) Slopes of swales for both “back to front” and “split” drainage shall be no less than 2.0% grade and no greater that 33% grade (3:1 slope).

i) When matching to existing properties where 2% slope cannot be achieved, then a 1.5% slope is permitted provided a 150 mm sub-drain is installed below the bottom of the swale and drained to a suitable outlet, with a minimum of 0.30 metre cover over the sub-drain or other mitigation measures.

j) Minimum slopes for a “wrap around” swale in the back yard shall be 1.0%

k) Driveway slopes shall not be less than 2.0% and not more than 7%. Reversed sloped driveways in new developments are not permitted.

l) Each lot is to be independently drained. Drainage to a nearby street through the rear of an adjacent lot is not permitted, unless the adjacent lot is part of the same development. In areas where “zero lot line” zoning is permitted drainage to a nearby street through the rear of an adjacent lot is not allowed.
m) Catch basins in rear yard swales shall be designated as “private” and shall drain not more than four (4) lots on either side of any swale leading into a catch basin on any side of the catch basin.

n) All slopes shall be 3:1 or flatter.

o) Provisions shall be made to prevent disruption of the natural surface drainage pattern on lands bordering the development both during and after construction.

p) If grading is required on lands adjacent to the development, which are not owned by the developer, then the developer must obtain written permission from the adjacent property owner to allow the developer to grade on the adjacent lands, otherwise retaining walls must be used.

q) Where a lot is lower in the rear than in the front, a split drainage grading design will be used in order to drain a portion of the lot to street catch basins. No front to rear drainage will be permitted

2.5.3 Grading Standards

Overall Grading Plan

The overall grading plan shall be prepared on a standard metric A1 size sheet or an Imperial 24” x 36” sheet at a scale of 1:500, stamped and signed by a professional engineer and shall show the following:

a) all lots and blocks of the lands to be developed as well as adjoining lands for a minimum of 15 metres beyond the limit of the lands to be developed and further if necessary to determine future and proposed drainage patterns

b) existing contours at 0.5 metre intervals over the entire development including sufficient area of adjacent lands to establish the overall drainage pattern

c) proposed elevations at the corners of each lot and block and at intermediate point of change in grade

d) proposed elevations at 15 metre spacing along the frontage of large blocks and at a reasonable spacing along the sides and rear of the block

e) proposed centre line road elevations:
   i) at all changes in grade, and
   ii) opposite lot corners of the lands to be developed

f) the location of all existing trees, septic tanks and tile fields, wells, above ground utility structures (street furniture) and other structures as necessary

g) the location of existing and proposed retaining walls with proposed top and bottom elevations at appropriate intervals with sections

h) the location of drainage ponds or swales, and direction of surface drainage on each proposed lot and block and on all adjoining lands

i) the location of rear yard catch basins and inlets and top of grate elevations

j) proposed building envelopes with the following information:
   i) front of house apron elevation (garage floor elevation)
   ii) back of house apron elevation, if different from front
   iii) minimum basement floor elevation (shall be calculated based on the elevation of the sanitary and/or storm private drains)

k) the stipulation that roof leaders shall discharge onto splash pads, satisfactory to the City Engineer and then to a grassed or landscaped area at a minimum distance of 0.60 metres away from the building face
The overall grading plan shall be prepared in accordance with the following objectives:

a) the whole drainage for the development shall be self contained and directed to a suitable outlet
b) the lot grading plan shall accommodate any external drainage, which is tributary to the development and must prevent ponding on adjacent lands bordering the subdivision
c) the establishment of independent and adequate drainage for each lot (this can be provided by either “back to front” drainage (recommended) or “split” drainage intercepted by a rear yard swale)
d) the establishment of lot and house grades which are generally compatible with existing topography and surrounding development, existing trees etc., without steep slopes or abrupt changes in grade with minimum terraces

Plot Plan for Each Lot

The plot plan for each lot shall be stamped and signed by a Professional Engineer, Ontario Land Surveyor, Architect or Landscape Architect for approval by the Director of Building and Licensing prior to issuing a building permit and shall show the following:

a) proposed elevations at the lot corners, which must conform to elevations on the approved grading plan
b) elevations of the proposed sidewalk adjacent to the lot, and where no sidewalk is proposed, then the corresponding back of curb elevation and the centreline road elevation
c) the elevation, design and basis of design of all retaining walls required
d) ground elevations on all sides of the proposed building and the driveway gradient and elevation at the house
e) elevations of all swales on the lot, the gradient of the required backyard apron and arrows showing flow to or from adjacent lands
f) existing and/or proposed private catchbasins, road catchbasins, hydrants, street lights, hydro transformers, telephone and cable boxes.

2.5.4 Grading Certificate for Final lot Grading

A final lot grading certificate shall be submitted by a Professional Engineer, on a form acceptable to the City and shall contain the following wording:

STANDARD GRADING CERTIFICATE

We have reviewed the final lot grading for the above mentioned lot and taken elevations where necessary to confirm direction and grade of surface drainage.

We therefore certify that the works have been completed in the field and that they conform to the approved overall and detailed grading plans for the subdivision and the City’s standards.
GRADING CERTIFICATE – DEVIATION

This is to certify that we have reviewed the final lot grading for the above mentioned lot and taken elevations where necessary to confirm the direction of surface drainage. While the final lot elevations do not match exactly the proposed lot grading plan, the basic lot drainage pattern has been adhered to and the intent of the approved overall grading plan has been met. No drainage problems were evident at the time of inspection.
2.6 Construction of Municipal Services

2.6.1 Pre-servicing

A Subdivision Agreement is required by the City to be signed and returned to the City by the Developer and the required financial and insurance obligations satisfied before construction can commence.

Stripping of topsoil and site grading works may commence before final approval is obtained subject to the following:

- an erosion and sedimentation control plan has been approved by the City and the Conservation Authority
- all erosion and sedimentation controls are in place prior to any earthworks on the site, and
- a Tree Preservation Plan, if required, has been approved by the appropriate agency and safeguards are in place.
- Archaeological clearance of the lands has been obtained (if required as a condition of draft plan approval).

Construction of the municipal services in the subdivision can only start once the following conditions have been satisfied:

- approval from the City and, where required, approval from the Conservation Authority of engineering design drawings for the works to be constructed to service the subdivision, including receipt of M.O.E. certificates and approval of an erosion and sedimentation control plan
- Director of Development approval of the proposed final plan of subdivision for zoning compliance and road pattern and alignment
- approval of a Tree Preservation Plan by the appropriate agency, when such plan is required, including implementation of all necessary safeguards
- verification that all erosion and sedimentation controls are in place prior to any earthworks on the site,
- submission of a signed Subdivision Agreement with the City of Hamilton and deposited cash and security (75% estimated construction cost) as required under the agreement
- submission of originally signed certificates of insurance for the Developer and the contractor as proof that both Developer and contractor have obtained adequate insurance coverage in accordance with the City's Subdivision Agreement
- payment of Stage 3 processing fees in accordance with the City's current User Fee By-law
- written verification that an archaeological survey has been conducted and the site is free and clear for construction, when the requirement for an archaeological survey is a condition of draft plan approval
- written verification that the subdivision lands have been decommissioned, when the requirement for decommissioning is a condition of draft plan approval
- completion of a pre-blast survey of residences within 100 metres and notification of residents of blasting within 200 metres of the subdivision lands, where services are to be constructed in rock
< arrangement for all required site inspections and materials testing for the works to be constructed to service the subdivision
< arrangement for a pre-construction meeting for construction of the works to service the subdivision

### 2.6.2 Requirements for Tendering

The Engineer shall call tenders for the works (if requested by the City) and shall analyse the bids received and make recommendations to the Developer and the City regarding the awarding of the works to the Contractor.

Where the City of Hamilton is responsible for the payment of items that involve substantial cost sharing by the City that is not based on "Flat Rate" basis for sanitary and storm sewers and watermains and the "New Roads Servicing Rate" for roadworks, the following tendering procedure shall be used:

1. Any project where the City has a cost sharing in excess of $50,000.00 + GST shall be tendered by an open tender (i.e. public notice in the Spectator and at the Hamilton Construction Association, etc.).

2. The tenders shall close at the Consultant's office (if local) or at City Hall if the Consultant is from out of town. The out-of-town Consultant shall make arrangements to book a room at City Hall for the tender opening.

3. A City representative will be present at the opening of the tenders to witness the bids received and shall be provided with copies of the Schedule of Quantities of the three low bidders immediately.

4. The Developer can select the Contractor of his choice for the project, but the City will pay for its share of the works only on the basis of the overall low bidder (unless there is a justified reason to choose another bid e.g. disqualification of bidder due to no bid bond, known bad track record, etc.)

5. The Engineer will certify on the Statements of City's Share of the Works that the City's share is based on the prices submitted by the low bidder that has been accepted by the City and shall provide supporting documentation where necessary.

### 2.6.3 Pre-Construction Meeting

The Engineer shall arrange for a pre-construction meeting to be held prior to start of construction. A check-list of items to be covered at the pre-construction meeting is provided in Appendix 11.

At this time, the City shall be provided with the following documents:

a) one priced and signed copy of the contract documents and Form of Tender
b) one blank copy of the contract documents and Form of Tender (without prices)
c) 2 copies of the General Plan of Services
d) 3 complete sets of construction drawings
e) electronic copy of the approved engineering drawings (in .DWG/DXF format).

The Engineer shall obtain a Construction Schedule from the Contractor and provide the City with a copy. The City shall be regularly informed as to the progress of construction and of any deviation from the original schedule.

### 2.6.4 Construction on Existing Roads

Traffic on existing roads shall be maintained wherever possible. In the event that a road closure is required, approval must be obtained from the City's General manager of Public Works.

A minimum of two weeks notice is required to co-ordinate a road closure. The City Traffic Operations will establish and sign the detour route and notify all emergency services and school board transportation services. The Developer's Contractor will be responsible to post and maintain traffic control signage on site.

All costs associated with road closures and detour routes shall be paid for by the Developer.

A written notice, shall be prepared by the City and hand delivered by the Engineer to all abutting properties advising of the road closure.

### 2.6.5 Inspection Services

#### 2.6.5.1 General Inspection

The Engineer has full responsibility for the actions of the Contractor and the quality of the work. It will be the Developer's responsibility to have his Engineer provide full time inspection services during the construction of all municipal services in the project.

City staff shall only provide a part-time monitoring of the construction activities to ensure general conformance to the subdivision agreement and the City's policies and standards.

The following inspection and testing works shall be carried out during and after construction of services:

**Sewer Mains**

- a. Sieve analysis of pipe bedding material for compliance with the specifications. Representative samples are to be obtained by the Geotechnical consultant during sewer operations. Pipe bedding material supplier shall be approved by the City prior to use.
- b. Compaction tests shall be performed to assure that pipe bedding and backfill material has been compacted properly.
- c. Regular inspection of work in progress of the sewer installation and noted defects corrected immediately.
- d. All sewers and manholes must be flushed and cleaned prior to testing. A mandrel test shall be performed on all flexible pipe sewer mains in accordance with OPSS 410 which consists of a successful pass of the "pig" pulled through
e. Infiltration/exfiltration testing conducted on all sanitary sewers using low air pressure or water in accordance with OPSS 410.07.15.02 to assure joints and manholes are properly sealed.

f. Video inspection of all sewer mains to assure that no defects exist.

g. After the completion of the roadworks (minimum base course asphalt) an initial visual inspection of the sewer works shall be completed with the contractor, Engineer and City. A report outlining deficiencies shall be provided by the City.

h. Prior to the expiration of the Guaranteed Maintenance Period a final visual inspection of the sewer works shall be completed

Watermains

a. Sieve analysis of pipe bedding material for compliance with the specifications. Representative samples are to be obtained by the Geotechnical consultant during sewer operations. Pipe bedding material supplier shall be approved by the City prior to use.

b. Compaction tests shall be performed to assure that pipe bedding and backfill material has been compacted properly.

c. Regular inspection of work in progress of the watermain installation and noted defects corrected immediately.

d. Hydrostatic pressure and leakage testing of the watermain.

e. Swabbing of the watermains.

f. Main disinfection and bacteriological sampling.

g. A conductivity test shall be performed on all PVC watermain installations.

h. After the completion of the roadworks (minimum base course asphalt) an initial visual inspection of the watermain works shall be completed with the Contractor, Engineer and City. A report outlining deficiencies shall be provided by the City.

i. Prior to the expiration of the Guaranteed Maintenance Period a final visual inspection of the watermain works shall be completed

Road Works

a. Sieve analysis of granular base material for compliance with specifications. Granular base course material supplier shall be approved by the City prior to use.

b. Compaction tests on the subgrade, granular base courses and asphalt courses to assure satisfactory compaction has been achieved. Asphalt mix designs and supplier shall be approved by the City prior to use.

c. “Proof rolling” of the subgrade prior to the placement of the granular road base courses. All soft and spongy sections shall be excavated and filled with suitable material.

d. Concrete tests (air, slump, and compressive strength) shall be performed to assure concrete meets specifications. Concrete supplier shall be approved by the City prior to use.

e. Initial visual inspection of the road works.

f. A final visual inspection of the road works prior to the expiration of the Guaranteed Maintenance Period.

Notwithstanding the aforementioned requirements, the Engineer shall not be relieved in any way from full responsibility from carrying out any further tests which may be required to assure services meet specifications.
Upon substantial completion and satisfactory inspection of the sewer and water systems, the City shall release sewer and water permits for the lots and blocks in the registered plan of subdivision.

2.6.5.2 Compaction and Material Testing

Compaction testing for trench backfill, road subgrade, granular courses and asphalt including material testing of concrete, asphalt, granular materials etc., is required for all development projects in the City of Hamilton. It shall be the Developer's responsibility to provide material and compaction testing by a qualified geotechnical testing company.

In cases where blast rock is proposed as a backfill material, for which test results cannot be obtained, the Developer shall engage a qualified geotechnical soils consultant to be present on a full-time basis to monitor the compaction procedures during backfill, and provide the City with a written certificate at the completion of backfill operations that an equivalent of 95% Standard Proctor Density has been achieved for the backfill of the trenches.

2.6.5.3 Video camera Inspection

The City shall initiate the initial video inspection of the sanitary sewers and storm sewers only upon receiving notification from the Engineer that the sewers and manholes are complete, the manholes cleaned and there is suitable access to the site.

A deficiency list, if any, shall be made available to the Engineer when the testing company has completed the video inspection. The Engineer shall take the necessary steps to have any deficiencies rectified. In case of disputes, a copy of the video inspection report shall be made available to the Engineer/Contractor for viewing purposes.

Prior to the expiration of the Guaranteed Maintenance Period, the City may elect to carry out another video inspection of the sanitary and storm sewers, at no expense to the Developer.

Re-inspections of the sewer system for confirmation of correction of deficiencies shall be carried out by the City and all associated costs will be at the Developer’s expense.

2.6.5.4 Watermain Testing

The Engineer shall ensure that the Contractor assists City staff in the testing of the watermain. The Contractor is to provide all materials, equipment and personnel for pressure and leakage testing, swabbing, and disinfection and bacteriological testing of the watermains. City staff shall arrange for water samples to be collected and tested for potability at the City Lab.

2.6.5.5 Initial and Final Visual Inspections

The initial visual inspection of the sewers shall consist of inspecting of all manholes and catch basins to assure the structures are complete (i.e. ladder rungs, correct frame and
cover, temporary bulkheads removed, silt controls in catch basins, and free of debris. The initial visual inspection of the watermains shall consist of the inspection and operation of all main valves, hydrants and secondary valves. All valves and hydrants shall be left in the "open" position, unless noted otherwise. Valves 400mm and larger shall be operated by the City Waterworks Section.

Prior to the expiration of the Guaranteed Maintenance Period a final visual inspection of the watermain and sewer works shall be conducted.

The final visual inspection of the watermain works shall consist of inspecting and operating all main valves, hydrants and secondary valves, and curb stops. Valves 400 and larger shall be operated by the City Waterworks Section. The Contractor and Engineer shall satisfy themselves that all curb stops and located and operable prior to requesting the final visual inspection with the City.

The final visual inspection of the sewers shall consist of inspecting all manhole and catch basins and their adjustments.

The final visual inspection of the above ground works shall consist of, but not limited to the curbs and gutters, sidewalks, approaches, surface asphalt and boulevard sodding.

The initial and final visual inspections shall be conducted by the Contractor, accompanied by the Engineer and the City.

The City will provide one (1) field inspection after the final visual inspection to inspect and to confirm correction of deficiencies, however, subsequent inspections may be invoiced to the Developer on an hourly basis.

2.6.6 Substantial Completion of Works

The Engineer shall certify substantial performance of the Contract of Works and shall supply the Contractor with the necessary information for publication in accordance with the Construction Lien Act, 1983 or latest revision. Satisfactory evidence shall be provided to the City that it has been published, before the City will reduce the securities it holds for performance of the works.

2.6.7 Acceptance of Works - Start of Maintenance Periods

The "Start of Maintenance" date shall be established and the services placed on the maintenance period providing the following conditions have been satisfied:

a) the plan of subdivision has been registered
b) the construction of services has been certified as substantially complete
c) geotechnical reports confirming acceptable compacting testing
d) the Engineer has submitted as-constructed information in a form satisfactory to the City Development Engineering Section
e) the required inspections reveal that there are no major deficiencies in the sewer and watermain systems constructed under the subdivision agreement.

Maintenance periods will be established for the following phases of construction
a) completion of all below ground services (sewer and watermain)
b) completion of above ground works (after placement of the surface course asphalt)
c) completion of the landscaping

The Developer shall maintain all below ground services (sewer and watermain works) for a period of not less than two (2) years from the date of the "Acceptance of Works" as issued by the City.

The Developer shall maintain all above ground works (roadways, curbs and gutters, sidewalks, driveway approaches) for a period of not less than one (1) year from the date of the "Acceptance of Works" as issued by the City. The one year maintenance period shall not commence until the placement of the surface coarse asphalt.

The Developer shall maintain all landscaping (street trees, boulevard sodding) for a period of not less than two (2) years from the date of the “Acceptance of Works” as issued by the City.

2.6.8 Repairs

The Developer shall make good in permanent manner satisfactory to the City, any and all damage to the works during their construction and during the maintenance period.

2.6.9 Assumption of Works – End of Maintenance

Prior to the "end of the maintenance" period for the below ground works, the Engineer shall submit a request for a final visual inspection of the sewers and watermains with the City. In addition, a mandrel test shall be performed by the Contractor on all PVC sewers (sanitary and storm) in accordance with OPSS 410.07.15.05. When all identified deficiencies have been completed to the satisfaction of the City, a certificate of completion and final acceptance will be established.

Prior to the "end of the maintenance" period for the above ground works, the Engineer shall request a final visual inspection with the City. When all deficiencies have been corrected to the satisfaction of the City, a certificate of completion and final acceptance will be established.

Prior to the City accepting any services, the Developer shall:
• submit a declaration that the Developer has paid all accounts in connection with the installation and maintenance of the said works and that there are no outstanding claims
• all repairs have been corrected to the satisfaction of the City

2.6.10 Security Reductions

The Developer may apply for a reduction in securities held by the City, once the works have been constructed. Each request for security reduction will be accompanied by a Certificate from the Engineer, outlining the value of the completed works as well as the
value of incomplete works. The value of the incomplete works shall be estimated on the basis of the signed Contract of Works for the project.

Any interim requests for reduction in securities shall be accompanied by a proof of payment to the Contractor based on the latest payment Certificate used by the Engineer to certify the value of incomplete works.

A security reduction processing fee will be applied after the third reduction.

A copy of the standard format to be used for requests for reduction in securities is shown in Appendix 12.

2.6.11 Service Locates in New Subdivisions

The Developer shall be responsible for providing all "in-field" locates of services constructed under the plan of subdivision when requested under the "Ontario One Call" or equivalent system, and shall assume all liability associated with the service locates that are required to be provided any time from the start of construction of sewers and watermains, up to the time the Developer (or his Engineer) has submitted, in a form satisfactory to the City, preliminary "as-built" information on the services installed by the Developer's Contractor.

This preliminary "as-built" information shall be submitted as soon as possible upon completion of construction in a form of prints of as-constructed engineering drawings.

Initially, the City shall retain securities in the amount of $5,000.00 per plan-profile sheet of the engineering drawing or part thereof, to ensure that the preliminary as-built information is made available in a speedy fashion. Thereafter, the securities shall be reduced to $1000.00 per plan-profile sheet to ensure that the final as-constructed mylar engineering drawings are submitted.

If the City has not been provided with the preliminary as-built information, then any requests to provide service locates under the Ontario One Call system will be directed to the Developer who shall provide the necessary field locates.
2.7 As-Constructed Drawings

All engineering drawings included in the final design drawings (except lot grading plans) shall be up-dated to incorporate the following as-constructed information:

**Sewers**
- sewer length measured from centreline to centreline of manhole cover
- percent grade of sewer
- invert elevations at manholes, plugs and bulkheads
- manhole cover elevation

**Private Drains**
- location of private drain at main sewer dimensioned (chainage) from a manhole
- location of private drain at streetline referenced by a measurement from a lot corner
- where risers are used indicate with ‘R’

**Watermains**
- chainage of watermain appurtenances (tees, bends, reducers, hydrants, etc.) starting with 0+00 at a main valve or from a hydrant if no main valve
- specify manufacturer’s name and model number for all valves and hydrants

**Water Services**
- location of all private water service at the main (mainstop) to be indicated by chainage
- location of curb stop to be referenced by a measurement from a lot corner

**General**
- rock profile, where applicable
- all references to “proposed” to remain on drawings, unless the works were not constructed and the corresponding notes shall be crossed out (it will be assumed that all works were constructed unless otherwise noted)
- a certificate to be added to each drawing

"This certifies that the work shown on this drawing related to underground works has been completed in the field as required by the City of Hamilton subdivision agreement. All underground services shown are as-constructed."

_________________________________________  ___________________________
Date  Engineer

One copy of the as-constructed drawings shall be submitted to the City for review. Upon acceptance of the information on the drawings, the Engineer shall certify the drawings and provide mylar copies of all drawings (including a copy of the original lot grading plan and detail sheets) to the City for its permanent record.

The Engineer shall also provide the drawings in electronic file format (*.DWG or *.DXF), if available.
2.8  City Subdivision Agreement

2.8.1 General

Once the engineering drawings and the cost schedules have been approved, the City Planning and Development Department, Development Engineering Section, shall prepare the City Subdivision Agreement and circulate it to the Developer's solicitor for review.

A copy of the draft City subdivision agreement is attached as Appendix 13

2.9  Building Permits

No building permits shall be issued for any lot, block, unit or severed parcel within the Land by the City;

a) until the Plan of Subdivision, if any, has been registered on title; and,

b) until the required Subdivision Agreement has been registered on title; and,

c) until such time as the Engineer has certified that watermains, including fully serviceable and operative fire hydrants, together with a roadway, which includes granular base and base asphalt, have been installed in accordance with municipal standards to the satisfaction of the City; and,

d) until such time as the Engineer has certified that the lots, blocks, units or severed parcels have been pre-graded in accordance with the requirements of the Subdivision Agreement for pre-grading; and,

e) until a Detailed Grading Plan indicating the site of the building, the main floor and top of foundation wall elevations, and the proposed grading according to the Overall Grading Plan has been prepared by an Ontario Land Surveyor or a qualified Professional Engineer and filed with the Director of Building and Licensing, or designate; and

f) all trees to be preserved on the lot, block, unit or severed parcel have been satisfactorily protected in accordance with the standards established by the City; and,

g) unless otherwise prescribed in Schedule "D" (Specific Provisions) of the Subdivision Agreement.

Notwithstanding the foregoing provisions of this section, a building permit may be issued by the City, provided the Engineer certifies that:

a) an existing charged hydrant is located within 150 metres, and;

b) an acceptable street access has been provided to within 90 metres, of the construction site's property boundary.
Financial Policies

3.1 Over-sizing of Infrastructure

The term “over-sizing” in the context of this policy refers to sewers or watermains or roadways whose size has been increased (over-sized) beyond the size of a local service, as listed under sections 3.1.1 & 3.1.2 (below), and is therefore intended to service an area over and above the development proposed. The City’s contribution towards over-sized services constructed under subdivision agreements is based on the principle that no single Developer should pay the up-grade cost of municipal infrastructure which is intended to benefit and service all of development. Contribution by the City towards the cost of over-sized services constructed under subdivision agreements under this policy is funded from revenues collected by the City through its Development Charge.

3.1.1 Sanitary Sewers, Storm Sewers and Watermains

A Developer is required to pay the full cost for the installation of sanitary sewers and manholes, storm sewers and manholes and watermains, valves and chambers up to and including the following sizes:

<table>
<thead>
<tr>
<th>Type</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANITARY SEWER</td>
<td>450mm diameter</td>
</tr>
<tr>
<td>STORM SEWER</td>
<td>1200mm diameter</td>
</tr>
<tr>
<td>WATERMAIN</td>
<td>300mm diameter</td>
</tr>
</tbody>
</table>

The City shall contribute towards the cost to install sanitary and storm sewers and watermains, which exceed the sizes listed above and are considered over-sized, on a "Flat Rate" basis in accordance with the rates shown in Table 3.1, plus engineering and overhead fees and GST.

Over-sizing rates under Table 3.1 shall be adjusted annually by the City each November using the September issue of the Canadata Construction Cost Index (Ontario Series) for that year.

3.1.2 Roadworks

Under this policy the following road classifications shall apply:

- **ARTERIAL ROAD** describes a road, which functions as a strategic link in the overall road network of the City. Arterial roads carry relatively large volumes of short and long distance traffic in and through the City and provide some access to abutting properties.

- **COLLECTOR ROAD** describes a road whose function is to provide a connecting road link between Arterial and Local roads.
Collector roads generally carry lower traffic volumes than Arterial roads and may provide direct access to abutting properties.

LOCAL ROAD provides direct access to abutting properties and carry traffic predominantly of a local nature.

A Developer is required to pay the full cost for installation of an 8.0m wide (local) roadway with deep strength asphalt pavement, consisting of 150mm Granular “A” and 300mm Granular “B” bases, 80mm base course (HL8) asphalt and 40mm final course (HM3) asphalt constructed under subdivision agreements.

The City of Hamilton shall contribute towards the cost of over-sized roads, which may be required on collector and arterial streets constructed under subdivision agreements. Over-sized roads are roads for which the design standard is greater than 8.0 metres in width and/or where the design requires extra depth pavement consisting of additional base course (HL8) asphalt and/or granular bases over the standard requirements of a local road due to traffic considerations. Extra asphalt or granular bases required during the construction stage due to sub-soil conditions and/or method of construction shall not be compensated by the City.

Contribution by the City toward the cost of over-sized roads shall be on a "Flat Rate" basis in accordance with the rates shown in Table 3.1.

### 3.2 Cost Sharing for Frontage

In this policy,

Aboveground works refers to and includes all of the following:

- asphalt road on a granular base,
- concrete curb and gutter, including sub-drain,
- sidewalk,
- catch basins and connections,
- street lighting, and
- utility trenching

Underground works refers to and includes all of the following:

- storm and sanitary sewers, including manholes,
- storm and sanitary private drain connections, and
- watermains, valves and chambers and water service connections

### 3.2.1 New Roads Servicing Rate

All cost sharing by the City or cost recoveries as a result of previous front-ending by the
City for aboveground works shall be based on a flat rate system referred to as the “New Roads Servicing Rate”.

The New Roads Servicing Rate represents the average cost of aboveground works constructed under Subdivision Agreements, less the portion of the cost related to over-sizing, but does not include an overhead for engineering and administration fees or GST, which shall be payable in addition to the Servicing Rate. The City shall set the New Roads Servicing Rate annually at the beginning of each year (See Table 3.2).

All costs collected by the City from Developers as a result of previous front-ending by the City for existing or future aboveground works shall be based on the New Roads Servicing Rate. The length of property frontage and/or flankage of the lands to be developed, which abut the existing or future works, shall be multiplied by the New Roads Servicing Rate and the sum shall be paid to the City prior to final approval of the lands to be developed.

If it can be demonstrated that the abutting property has previously paid for the aboveground works (or part thereof), the Manager of Development Engineering shall adjust the rate accordingly.

3.2.2 City lands

The City shall pay its share of the cost of aboveground and underground works constructed adjacent to:

i) land that has been conveyed, or, is to be conveyed to the City to satisfy the requirement for parkland under the Planning Act. The City’s share of servicing cost for above and below ground works to be paid at the time of completion of construction.

ii) the frontage of a storm water management pond which is greater than 8.0 metres when the requirement for additional frontage beyond 8.0 metres is mandated by the City. The City’s share for above and below ground works to be paid following completion of construction.

iii) vacant land owned by the City, which lands do not include any undevelopable lands such as environmentally sensitive areas, open space lands, woodlands, creeks, and other hazard lands. The City’s share of servicing cost shall be paid upon development of the vacant land or when the vacant land takes direct benefit of the service.

iv) land currently used for the operation of the City such as fire halls, public works yards, arenas or community centres. This does not include land of an existing road allowance, which may abut front-end works. The City’s share of servicing cost for aboveground works shall be paid following completion of construction. The City share of underground works shall be paid at the time when the land takes direct benefit of the underground service.
For aboveground works the City's share shall be based on the New Roads Servicing Rate.

For underground works the City's share shall be based on the length of the frontage of the City lands as a percentage of the total length of frontage of all the lands within the limit of the works constructed along the road. The percentage calculated from the frontage of the City lands shall be applied to the actual cost of the works along the road to determine the City's share of the cost.

In all cases allocation of the City's share of servicing costs in any year for works constructed under subdivision agreements is subject to the availability of funding in the Capital Budget as approved by the City for that year.

The City shall finance these costs through the Unsubdivided Land Reserve.

### 3.2.3 Fencing Adjacent to City Lands

Where a development abuts City lands or lands to be conveyed to the City as a condition of development approval, and a Developer is required to install a fence to separate the developed lands from City lands, then the Developer shall pay the full cost of the fence installation. For lands conveyed to the City to fulfil the requirement for Parkland under the Planning Act the cost of the fence installation shall be shared equally between the Developer and the City based on the cost of a 1.50 metre high chain link fence.

The City shall finance the cost of these works from the Parks Trust Fence account.

### 3.2.4 Identification of Cost sharing in the Subdivision Agreement

The Engineer shall prepare a cost schedule for inclusion in the City’s Subdivision Agreement (Schedule “F” - Estimate of Costs and Description of Works to be carried out by the Owner). This cost schedule shall identify all the works required to service a Developer’s proposed plan, the estimated cost of the works and the City’s share of that cost in accordance with the City's approved Financial Policies.

### 3.2.5 Value of Land for Road Allowances

Where a Developer is required to dedicate more than 13 metres of land to establish road allowance width, measured from one side of the centerline of the ultimate road allowance width to its limit, then the City shall compensate the Developer for the value of land dedicated beyond 13m on that side of the road allowance, for the length of the conveyance.

Daylight triangles are not to be included in the calculation for the over-contribution of land for road allowances.

The value of the over contribution of land shall be the lower of two estimates made by independent appraisers, approved by the City. The Developer shall pay the appraisal fees.
The City shall fund the cost of the over dedication of land through the Development Charge Reserve.

3.3 **Best Efforts Obligation**

### 3.3.1 Identification of “Best Efforts” in the Subdivision Agreement

A Developer shall pay the initial front-end cost of all works constructed under the City’s Subdivision Agreement, less over-sizing, adjacent to land that is not owned by that Developer, excluding lands owned by the City as defined by Section 3.2.2 of this policy.

The Developer’s Engineer shall calculate the estimated cost of the front-end works and identify the abutting lands not owned by the Developer, adjacent to the front-end works. The City shall include the estimated cost of the front-end works and the abutting properties in the City’s Subdivision Agreement as a “Best Efforts” recovery for the Developer in the future.

### 3.3.2 Cost Calculation for “Best Efforts” Recoveries

Upon completion of the front-end works, the Engineer shall certify to the City the actual cost of the completed works and provide the City with a detailed breakdown of the cost. The City shall review the cost breakdown and advise the Engineer if the costs are satisfactory. Once the Engineer and City agree to the actual costs to be recovered for the front-end works, a rate for the “Best Efforts” recovery shall be set by the City and applied to the frontage and/or flankage of the abutting lands.

In the instance where development of the abutting lands takes place prior to completion of the front-end works then the cost calculation for a “Best Efforts” recovery of the front-end works shall be based on the unit cost of the signed tender document for the works.

The City will carry out its “Best Efforts” obligation under the Subdivision Agreement to collect the adjacent landowner’s share of the cost of the works, as a condition of development approval and reimburse the front-ending Developer for its initial up front cost of those works, in accordance with the City’s approved Cost Recovery Policies.

3.4 **Cost Recovery Policies**

### 3.4.1 0.3m Reserves along the Open-side of Road Allowances

*(new roads only)*

Where new roads are constructed adjacent to undeveloped land, the portion of a road allowance abutting the undeveloped land shall be referred to as the open side of a road allowance. The City shall establish a 0.30 metre reserve along the open side of a road allowance to ensure that all outstanding requirements of the City with respect to the front-end cost of the road and development of the adjacent lands are fulfilled by the abutting landowner.
When development of lands abutting the open side of a road allowance occurs then, prior to removal of a 0.30 metre reserve by the City, an abutting landowner shall:

i) satisfy all outstanding requirements of the City related to development of the lands abutting the reserve; and,

ii) prepare and register on title, at the Developer’s expense, a surveyor’s reference plan identifying the portion of the existing reserve to be lifted which is adjacent to the lands to be developed.

Upon fulfilment of all conditions of development approval, which have been imposed as a result of a development application on lands abutting the open side of a road allowance, the City will pass a By-law to have the 0.30 metre reserve incorporated into the public road allowance.

3.4.2 Front-ending by Developer - “Best Efforts”

Where the City has agreed, through its “Best Efforts” obligation under the Subdivision Agreement, to recover the cost of works on behalf of a front-ending Developer, the cost to be recovered shall be the actual cost of the works, which abut the adjacent lands, less the portion identified as over-sizing. The actual cost, less over-sizing, shall be adjusted by the Canadata Construction Cost Index from the month in which the works were constructed to the month the recovery is due.

3.4.2.1 New Roads

If an application is received by the City for development of lands along the open side of a road allowance where services have been constructed by a front-ending Developer under the “Best Efforts” provision of the subdivision agreement, then the City will use its authority under the Planning Act to collect the adjacent landowner’s share of the front-end service costs prior to final approval of the application. Monies collected by the City in fulfilment of its “Best Efforts” obligation under the subdivision agreement will be forwarded to the front-ending Developer.

3.4.2.2 Existing Roads

Where a Developer is required to front-end the construction of services along an existing municipal road under the “Best Efforts” provision of the City’s Subdivision Agreement in order to service the lands to be developed, then the City will pass a Municipal Act By-law for the purpose of assessing and rating each property for the cost of the front-end servicing by a Developer.

Cost recoveries from adjacent properties for front-end servicing by a Developer on an existing municipal street; will occur in either one or both of the following ways:

i) If a request is made by a landowner to connect to the front-end service, then the City will use its authority under the Municipal Act By-law to recover the adjacent owner’s share of the servicing cost; or,

ii) If an application is received by the City for development of lands adjacent
to the front-end works, then the City will use its authority under the Planning Act to recover the adjacent landowner’s share of the front-end service costs. The City will collect cost recoveries for lands under development application prior to final approval of the application.

All monies collected by the City in fulfilment of its “Best Efforts” obligation under the subdivision agreement will be forwarded to the front-ending Developer. Where lands are developed with reverse frontage single or semi-detached lots that have been mandated by the City, then no recovery will be made by the City for front-end works along the rear portion of the reverse frontage lots.

3.4.3 Front-ending By the City

3.4.3.1 Aboveground Works

Where the City has paid for construction of aboveground works along 0.30 metre reserves under previous subdivision agreements the City shall recover that cost, less the portion identified as over-sizing, from an abutting landowner prior to removal of the reserve. The City shall use the “New Roads Servicing Rate”, in force at the time of final approval for a development application, multiplied by the length of the 0.30 metre reserve adjacent to the lands to be developed. The sum shall be collected by the City as a recovery for the above ground works.

3.4.3.2 Underground Works

In the past the City has installed sewers and watermains within some existing public road allowance under the Local Improvement Act. The City has assessed those properties abutting the Local Improvement works based on a Local Improvement Rate approved in the year a project was constructed. In most cases the assessed Local Improvement Rate did not represent the full cost of the project after over-sizing cost is deducted. Thus, each project included a non-rated component, which was paid by the municipality.

Recovery of the non-rated portion of a project cost has occurred in one of two ways. Firstly, where the non-rated portion of the project cost has been identified as a Development Charge capital project cost, the recovery has occurred through payment of the City’s Development Charge. Secondly, where the non-rated portion of the project cost has not been identified as a Development Charge capital project cost, the City has recovered this portion as a condition of Plan of Subdivision or Consent approval when the land abuts the existing works and derives benefit form the service. This non-rated portion of a project cost is generally referred to as the “Subdivider’s Share” of the cost.

The non-rated potion of a Local Improvement Project cost typically referred to as the “Subdivider’s Share” shall be collected by the City as a condition of subdivision or Consent approval where such outstanding project costs apply to lands abutting and benefiting from the service.

The City shall adjust the “Subdivider’s Share” of the project cost by the Canadata Cost Index from the month when the works were constructed to the month when the cost recovery is due.
Payment of the adjusted amount shall be made to the City prior to final approval of a Subdivision or Consent application.

3.4.4 Payment for Future Works (above and below ground works)

The City shall collect a security deposit through its Subdivision Agreement from a Developer for payment of the Developer’s share of future roads and services, which will abut the proposed development when constructed in the future. Security for future aboveground works shall be based on the New Roads Servicing Rate applied to the frontage and/or flankage of the development adjacent to the future works whereas security for underground works shall be estimated based on pipe sizes of the future underground services.

3.4.5 Payment for Future Urbanization of Existing Rural Roads within the Urban Boundary

Where development of land creates lots or blocks, abutting an existing road of rural cross section which is within the Urban Area Boundary as defined by the Official Plan, then the City shall collect a cash payment from the Developer. The cash payment represents the Developer’s share of the cost to urbanize the existing rural road and will be collected as a condition of development approval based on the New Roads Servicing Rate applied to the frontage and/or flankage of the development adjacent to the existing rural road.

3.4.6 Exemptions from Cost Recovery

Where the City has mandated the development of land with reverse frontage lots for single, semi-detached or multiple dwellings with freehold single lots (i.e. street townhousing), along existing collector or arterial streets, then there shall be no payment by a Developer to the City for existing or future works along the frontage of the rear portion of the reverse frontage lots created by the development.

Where the City has mandated that direct access from freehold lots is not permitted to an existing roadway but access is required by means of a joint access along a shared service roadway, then there shall be no payment by a Developer to the City for existing or future above-ground works along the frontage of the lots created by the development. The Developer shall, however, be responsible for his share of the construction of below-ground infrastructure. For freehold lots created along a new roadway proposed within the same development, the Developer will be responsible for all costs, less oversizing, for the frontage of the freehold lots along the new road.

3.4.7 Timing of Funding from City

The timing of payment for the City's share of servicing costs eligible for each development shall be subject to the availability of funding approved and allocated in the City's Annual Capital Budget.

Any Developer requesting payment for City cost-sharing funding shall do so, in writing to
the City's Director of Development, prior to October 1st of each calendar year. Such requests can apply to both completed works or imminently proposed works.

Any development requiring the City's share of works to be paid beyond the approved Capital Budget amount for that year shall require the approval of City Council. The Director of Development may authorize funding to be paid during the year for completed eligible projects not initially allocated funds during the Capital Budget process, subject to the availability of reserved monies funded that year.
### Table 3.1
UNIT PRICES FOR CITY SHARE OF OVER-SIZED WORKS CONSTRUCTED UNDER SUBDIVISION AGREEMENTS - 2003 RATES

<table>
<thead>
<tr>
<th>WATERMAINS</th>
<th>UNIT PRICE PER METER</th>
<th>UNIT PRICE FOR VALVE CHAMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>300mm dia.</td>
<td>- NIL-</td>
<td>- NIL-</td>
</tr>
<tr>
<td>400mm dia.</td>
<td>$63.00</td>
<td>$17,303.00</td>
</tr>
<tr>
<td>500mm dia.</td>
<td>$186.00</td>
<td>$21,736.00</td>
</tr>
</tbody>
</table>

NOTE: For 400mm dia. air valve/blow off chambers the unit price per chamber is $17,303.00.

<table>
<thead>
<tr>
<th>SANITARY SEWERS</th>
<th>UNIT PRICE PER METER</th>
<th>UNIT PRICE FOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>450mm dia.</td>
<td>- NIL-</td>
<td>- NIL-</td>
</tr>
<tr>
<td>525mm dia.</td>
<td>$28.00</td>
<td>- NIL-</td>
</tr>
<tr>
<td>600mm dia.</td>
<td>$63.00</td>
<td>- NIL-</td>
</tr>
<tr>
<td>675mm dia.</td>
<td>$96.00</td>
<td>$1,574.00</td>
</tr>
<tr>
<td>750mm dia.</td>
<td>$159.00</td>
<td>$1,574.00</td>
</tr>
<tr>
<td>825mm dia.</td>
<td>$219.00</td>
<td>$1,574.00</td>
</tr>
<tr>
<td>900mm dia.</td>
<td>$282.00</td>
<td>$3,711.00</td>
</tr>
<tr>
<td>975mm dia.</td>
<td>$336.00</td>
<td>$3,711.00</td>
</tr>
<tr>
<td>1050mm dia.</td>
<td>$405.00</td>
<td>$3,924.00</td>
</tr>
<tr>
<td>1200mm dia.</td>
<td>$651.00</td>
<td>$6,749.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STORM SEWERS</th>
<th>UNIT PRICE PER METER</th>
<th>UNIT PRICE FOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200mm dia.</td>
<td>- NIL-</td>
<td>- NIL-</td>
</tr>
<tr>
<td>1350mm dia.</td>
<td>$186.00</td>
<td>- NIL-</td>
</tr>
<tr>
<td>1500mm dia.</td>
<td>$372.00</td>
<td>- NIL-</td>
</tr>
<tr>
<td>1650mm dia.</td>
<td>$618.00</td>
<td>$3,710.00</td>
</tr>
<tr>
<td>1800mm dia.</td>
<td>$866.00</td>
<td>$3,710.00</td>
</tr>
<tr>
<td>1950mm dia.</td>
<td>$1,113.00</td>
<td>$3,710.00</td>
</tr>
<tr>
<td>2100mm dia.</td>
<td>$1,362.00</td>
<td>$7,427.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROADWORKS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Pavement for Local Roads (to base course)</td>
<td>$32.85 per square metre of extra width of regular pavement</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.1  
UNIT PRICES FOR CITY SHARE OF OVER-SIZED WORKS CONSTRUCTED UNDER SUBDIVISION AGREEMENTS - 2003 RATES

<table>
<thead>
<tr>
<th>Description</th>
<th>Rate Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Pavement for Local Roads (top coat asphalt)</td>
<td>$8.00 per square metre of extra width of regular pavement</td>
</tr>
<tr>
<td>Asphalt Pavement for Collector Roads **2</td>
<td>$3.10 per square metre of extra depth asphalt pavement</td>
</tr>
<tr>
<td>Asphalt Pavement for Arterial Roads **2</td>
<td>$12.05 per square metre of extra depth asphalt pavement</td>
</tr>
</tbody>
</table>

1  The City shall pay engineering fees, overhead and GST in addition to the Unit Prices as detailed in the Subdivision Agreement schedules.

2  To be paid upon completion of base course asphalt
Table 3.2
New Roads Servicing Rate (2003 Rates)
(does not include engineering, overhead and GST) **1

<table>
<thead>
<tr>
<th>Item</th>
<th>$ per metre of frontage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curbs and subdrains</td>
<td>$ 55.35</td>
</tr>
<tr>
<td>Street Catch basins and connections</td>
<td>$ 27.80</td>
</tr>
<tr>
<td>Asphalt Pavement (upto base course asphalt)</td>
<td>$131.40</td>
</tr>
<tr>
<td>Asphalt pavement (top coat asphalt)</td>
<td>$ 32.00</td>
</tr>
<tr>
<td>Sidewalks (both sides)</td>
<td>$ 71.80</td>
</tr>
<tr>
<td>Sidewalks (one side only)</td>
<td>$ 35.90</td>
</tr>
<tr>
<td>Street Lighting</td>
<td>$ 18.00</td>
</tr>
<tr>
<td>Utilities trenching</td>
<td>$ 11.00</td>
</tr>
</tbody>
</table>

1 The City shall pay engineering fees, overhead and GST in addition to the Unit Prices as detailed in the Subdivision Agreement schedules.
Best Efforts - Cost Recovery Clause

(1) For the purposes of this section:

"Benefiting Area" means those lands that will derive a benefit from the construction, installation and/or provision of the Improvements defined herein;
"Benefiting Owner" means any owner of land within the Benefiting Area, other than the Owner, as described under Schedule “B” of the attached Agreement. Such Benefiting Owners shall be designated under Schedule “F-2” of the attached Agreement;
"Improvements" means those Services set out and designated as such in Schedule “F-2” of the attached Agreement, which services are required to enable both the Owners' lands and the Benefiting Area to be serviced;
"Improvement Costs" as defined in Schedule “F-2” of the attached Agreement.
"Proportionate Share of Improvement Costs" is the reasonable share attributed to each Benefiting Owner, calculated pursuant to the formula in Schedule “F-2” of the attached Agreement and payable to the City for reimbursement to the Owner.

(2) The Owner has made application to the City to develop the Land described under Schedule “A” of the attached Agreement, which Land requires construction, installation and provision of certain works, facilities and services (herein after referred to as “Improvement(s)”) which are outside or abutting the limit of the Land. Such improvements are related to or within the abutting area to the Lands and are necessary to allow for the development of the Lands. The City has, pursuant to Subsection 51(25) of the Planning Act and as permitted by subsection 59(2) of the Development Charges Act approved the installation, construction or provision of these Improvements as a condition to this Agreement.
(3) The Owners, at their sole expense covenant and agree to install, construct or otherwise provide these Improvements as described in Schedule “F-2” of the attached Agreement. The estimated cost to the Owner for the Improvements is $____________ and is detailed in Schedule “F-2” of the attached Agreement.

(4) The Owner agrees to provide to the City Engineer proof of the actual cost of the "Improvements" set out in Schedule “F-2” of the attached Agreement, (herein called the "Actual Cost") as soon as it is available. The City Engineer, in conjunction with the Director of Development will review the Actual Costs of the Improvements and determine the Proportionate Share of the Improvements Costs using the formula as set out in Schedule “F-2” of the attached Agreement.

(5) Subject to the provisions of this Agreement, the City shall require Benefiting Owners to pay their Proportionate Share of the Improvements Costs of the Improvements as a condition of an application for development of their Benefiting Lands or upon request to connect to the Improvement and shall be calculated according to the formula set out in Schedule “F-2” of the attached Agreement. The City covenants and agrees to use its best efforts to collect the Benefiting Owners share from the Benefiting Owners.

(6) The "Benefiting Owner's" share shall be calculated according to the formula set out in Schedule “F-2” of the attached Agreement and shall be adjusted by the percentage change in the Canadata Construction Cost Index (Ontario Series) from the date of Construction of the "Improvements" to the date of payment of any of the "Benefiting Owner's" share.

(7) The City shall require each Benefiting Owner to pay its Proportionate Share of the Improvement costs to the City, as a condition of approval of any development of the Benefiting Owners land located within the benefiting area. The Benefiting Owners proportionate share shall be calculated in accordance with the provisions in Schedule “F-2” of the attached Agreement. The payments are to reimburse the Owner described under
Schedule “B” of the attached Agreement for the Benefiting Owner’s share of the costs of the Improvements.

(8) The Owner covenants and agrees that the City may, in its discretion, release copies of any certificates, reports, contracts or other documents and materials that are in its possession to any Benefiting Owner for the purposes of satisfying a Benefiting Owner as to the amount of the Improvements.

(9) The City shall, within forty-five (45) days of receiving payment of the "Benefiting Owner's" share of the Improvements Costs from any of the “Benefiting Owners”, pay to the Owner under this Agreement the amount of the "Benefiting Owner's" share received.

(10) The City shall collect a fee from the Owner immediately upon execution of this Agreement for the administration of the recovery of the Improvement Costs associated with the "Benefiting Lands" for which the Owner under this Agreement is required to pay in accordance with this Section and Schedule "G" of the attached Agreement.

(11) The Owner covenants and agrees to indemnify, save, defend and keep completely harmless the City, its employees, elected officials, officers, contractors, servants and agents from costs, all actions, causes of action, suits and liabilities from or in any way connected with, but not limited to:

a) a breach by the Owner of their obligation under this Agreement
b) the installation of the Improvements or any other work performed pursuant to this Agreement and any construction liens relating thereto
c) any dispute arising with respect to the cost of installing the Improvements, including any disputes by a Benefiting Owner
d) all claims for property damage or injury, injuries resulting in death to any person, and any consequential damage arising from such
damages or injuries, whether such damage or injuries are caused by or attributed to the negligence of the City or its employees, elected officials, officers, contractors servants or agents.

(12) The Owner shall, at the request of the City, and at its own expense, retain such counsel as the City Solicitor deems necessary or desirable to represent the City in respect of any matter in respect of which the City is entitled to be indemnified or released by the Owner. The City shall be entitled to choose and exclusively instruct such counsel.

(13) The Owner agrees and acknowledges that the City obligations to under this section shall expire ten (10) years from the date of registration of this Agreement, unless otherwise extended in writing by both parties.

(14) The obligations of the Owner under this section shall survive any termination or expiry of this Agreement, anything in this Agreement to the contrary notwithstanding.
Re: Engineering Standards & Financial Policies

Dear Sally:


Comments contained within this letter were derived from our Development Council meeting of January 23, 2003. Comments are written in the order they appear within the Guidelines booklet and the HHHBA positions are made for the specific clauses.

Section 2 Land Development

2.3 Preliminary Engineering (Page 4)

Clause (d) (Page 4)

HHHBA Position:
City needs to put a process in place whereby TOE supplies information required on a timely basis

There should also be a master watermain plan for the City - Water Distribution Plan, which is accessible to the Consulting Engineers.

Agree. In order for the Engineer to complete a watermain distribution analysis, existing information on water pressures and flows at key nodes are required. This information is available from Public Works Department, Water and Wastewater Division, Operational Planning Section and they will make this information available. The Operational Planning Section has asked that requests for this information be made through the Development Engineering Section.

It was agreed that a master watermain distribution plan for the City would be beneficial and it is recommended that the City work towards this master plan.

2.4 Final Engineering Design (Page 6)
Clause (f)

HHHBA Position:
Minimum Guidelines and policy for landscape and streetscape requirements need to be developed as soon as possible.

Agree. Guidelines need to be developed with respect to requirements for boulevard streetscape.

HHHBA cautions that timely submissions from some Utilities may not be forthcoming and may result in substantial delays.

The City and HHHBA is aware of the lengthy delays in receiving designs from Hydro One. There appears to be no problems with the other utilities. HHHBA will be requesting Hydro One to attend a future liaison meeting to discuss this issue further.

Ontario Land Surveyor Submissions:  

Clause (f)

HHHBA Position:
Need to specify the timing of the parkland dedication appraisals or have some standard, in accordance with the Planning Act. Should be referred to the City’s parkland dedication policy.

The City is currently working with a consultant to develop a policy on parkland dedication.

2.4.4.9 Pipe Material (Page 31)

HHHBA Position:
Should be stated that all pipe materials are possible and that Hyprotech Ductile Iron and PVC can be used for non-corrosive or corrosive use.

Agree. Clarification to the document has been made with respect to the use of PVC and hyprotec ductile iron pipe. Both materials are permitted for corrosive and non-corrosive environments.

2.4.5.2 Pavement Design  

HHHBA Position:
This section should correspond to the OPS, and should be as recommended in the Geotechnical Consultant in its Report (2.4.1.9) as is standard industry practice.

The cross sections outlined are minimum standards. HHHBA felt that the depth of the binder asphalt was excessive and they have suggested that will have a geotechnical consultant review the specified cross section in the guidelines. In addition, they have suggested for the HL 3 mix as opposed to HM 3 for the surface course asphalt.

The cross sections were developed by Public Works Department and are currently used on their capital works projects. The binder asphalt thickness and surface course mix was discussed with Public Works and they recommend maintaining the standards as proposed.

2.4.5.7 Driveway Aprons (Page 41)

HHHBA Position:
We are opposed to driveway aprons. This should be homeowner choice. This Policy when read in conjunction with the sidewalk requirement would not produce uniform standards in any case.

HHHBA feels that the requirement to install concrete apron approaches is too onerous and feel that treatment of the approach should be left to the discretion of the property owner. They feel that property owners would prefer to use the same treatment as their driveway (ie. Impressed concrete, asphalt, etc.).

The City will not require the Developer to provide a concrete apron approach. The City will include a recommendation in their report to Council on the Development Engineering Guidelines to amend the Subdivision Agreement to include a clause that the construction and maintenance of the approach will be the responsibility of the homeowner.

2.4.5.12 Cul-de-Sacs (Page 44)

HHHBA Position:
13m asphalt turning circle is too large.

Disagree. The minimum radius for the turning circle will remain at the proposed 13m. This standard was established in consultation with the various departments in the City. This issue has been discussed at length at previous liaison meetings and will remain with a 13m radius.

2.4.5.16 Fencing (Page 44)
HHHBA Position:
The mandated black vinyl is an excessive standard. We recommend that galvanized is suitable.

*Disagree. There is a difference in price of approximately $1.00 per foot and $4.00 per fence post for black vinyl as opposed to galvanized. Black vinyl is more aesthetically pleasing and tends to blend in with the background. It was agreed that the same standard for fencing will be adopted that is currently being used by the City’s Parks Department.*

### 2.4.5.17 Walkways (Page 45)

**HHHBA Position:**
The requirement of 6m is too much and should be reduced.

*Disagree. The minimum width for public walkways shall remain at 6.0m.*

### 2.4.5.18 Parklands (Page 45)

**HHHBA Position:**
The timing requirement should reflect the realistic time frame and not be 6 months. Seasonal requirements should refer to OPS.

*Agree. Timing for the completion the grading and seeding of parklands shall be completed within two (2) seeding seasons after the placement of the binder course asphalt.*

### 2.4.7 Easements (Page 47)

**HHHBA Position:**
The requirements should be a function of pipe size and depth.

Clause (b) The requirement should only be 9m for dual sewer installation.

**HHHBA suggested the following easement widths:**
- 6m for one sewer
- 9m for dual sewers
- 4.5m for a watermain

**The City’s recommended widths for these are:**
- 9 metres for one sewer
- 12 metres for dual sewers
- 6 metres for watermain

The City’s Department of Public Works is concerned with any reduction of required easement widths and is not agreeable to any change to those standards recommended. Exceptions, where special circumstances warrant, may be considered, if justified, to the
satisfaction of both Development Engineering and Public Works as part of the preliminary engineering submission.

2.6.6 Start of Maintenance Periods (Page 58)

HHHBA Position:
The maintenance period for base roads should end the latter of 2 years or upon installation of surface course asphalt.

The establishment and duration of the maintenance period for above ground works are expressed in the subdivision agreement. Generally, the placement of the surface course asphalt is not completed until such time as all deficiencies in the binder asphalt and curbs and gutters are corrected to the satisfaction of the City, hence HHHBA members feel they should not responsible for maintenance of the curbs and gutters for one additional year.

The City is concerned of potential future damages to the curbs and gutters during the house building phase on vacant lots at the time the surface course is placed.

HHHBA will suggest to its member to include another security component at the building permit stage to ensure that damages to the curb and gutter during building is corrected at no expense to the City. Planning and Development to discuss this further with the Building Department.

2.6.9 Security Reductions (Page 60)

HHHBA Position:
Should reflect policy in place.

Agree. A copy of the security reduction requirements will be appended to the Development Engineering Guidelines.

Section 4 Financial Policies

4.1 Oversizing of Infrastructure (Page 63)

HHHBA Position:
The sizes of the Storm Water Sewers seem to be fairly large and should be reduced to 1050 mm on storm sewers

To be discussed further upon the completion of the comprehensive stormwater criteria and policy study. This will be dependent on the rainfall intensity curve that will be selected for the City.

4.1.2 Roadworks (Page 64)
HHHBA Position:
The local road definition should refer back to 2.4.5.2 and our
comments thereon rather than being reiterated here.

Agree. *The road cross section should coincide with the pavement
design as specified in Section 2.4.5.2 (page 37).*

### 4.2 Cost Sharing (Page 64)

**HHHBA Position:**
We strongly recommend that the city upfront the costs of all
above ground work for the 1-ft reserve along undeveloped
frontages. This would help facilitate development in cases of
fragmented ownership.

The City should establish a revolving reserve fund for 1-foot
reserve under the Development Charges Act. The fund would
allow for both the collection of and payment from, the fund,
depending on the situation.

*Disagree. The City should not be in the business of fronting costs to
facilitate development.*

*Disagree. Local services are not eligible for development charge
funding, therefore, would not permit funding the revolving reserve to
upfront costs for above ground works for 1 foot reserves along
undeveloped frontages.*

**4.2.2 Lands Dedicated for Park  (Page 65)**

**HHHBA Position:**
Infrastructure should be the responsibility of the City when
fronting parklands including passive or active parks, all
storm water ponds, and public walkways greater that 3
meters. It should not be the case for ESAs.

This same position holds true for lands owned by school
boards.

*Agree. The City shall pay its share of the cost of above ground and
below ground works constructed along the frontage of parklands and
storm water ponds in excess of 8m, when such frontage is requested by
the City.*

*Disagree. No payment for frontages associated with public walkways.*

*In the former City of Hamilton, the School Board had purchased lands
for future school sites and the Developer has no mechanism to collect*
for cost of services along frontages on lands owned by the School Board. A recommendation will be included in the report to Council to refer this item to the Development Charge Committee for consideration of reimbursement of costs for above ground works on existing sites owned by the School Board at the time of plan registration.

4.2.5 Value of Land for Road Allowances (Page 66)

HHHBA Position:
City should compensate for land over 13m from center line of original road allowance.

We would like to know how this policy is implemented when in an expropriation situation.

Where a developer is required to dedicate more than 13 meters of land to establish road allowance width, measured from one side of the centerline of the road allowance to its limit, then the City shall compensate the Developer for the value of the dedicated land beyond 13 meters for the length of the conveyance.

4.4.2 Front-ending by Developer – “Best Efforts” (Page 68)
Existing Roads

HHHBA Position:
City should reimburse on the front-ending work in cases of reverse frontage. In a case where the city mandates reverse frontage, the City should pay. Perhaps add, “However this does not relieve the City of its obligation to repay the developer’s front-ending costs”

A recommendation will be included in the report to Council to refer this item to the Development Charge Committee for consideration in the new Development Charges By-Law.

4.4.6 Exemption for Cost Recovery (Page 69)

HHHBA Position:
Where direct access is not permitted should also be added to this policy.

Agree to include “where direct access is not permitted”. Further, this shall only apply to above ground works. There shall be no exemption for below ground works.

Table 4.1 Unit Prices (Page 70 – 71)

HHHBA Position:
Table should be adjusted with an emphasis on current rates as opposed to indexed historical rates.

Agree in principle to adjust rates to reflect the current prices as opposed to indexed historical rates. The rates for above ground works can be annually, however it is more difficult for below ground works. There is insufficient amount of data available annually to review the rates. It was suggested that rates for the below ground works can be reviewed every 3 to 5 years.

In closing, we would like to recommend that our representatives meet with you very soon to discuss our industry feedback. If I can be of any further assistance, please do not hesitate to call me at (905) 575-3344.

Best Regards:

[Signature]

Chris Phillips
City of Hamilton
71 Main Street West
Hamilton, ON L8P 4Y5

Attention: Ms. Sally Yong-Lee

Dear Ms. Yong-Lee:

RE: DRAFT DEVELOPMENT ENGINEERING GUIDELINES

A copy of the draft Development Engineering Guidelines (dated December 19, 2002) has been circulated through our office. The comments have been collected and compiled below:

Discrepancies

- The new Temporary Turning Circle Detail: The dimensions for the circle size do not reconcile as there is a 0.5m discrepancy between the combined dimensions and the overall dimension of 34.5m.

  *Overall dimension for the temporary turning circle detail revised to read 35m.*

- Item 2.4.4.6 states that in general, valves for watermains should be designed so that they are not within the roadway. However, the new ROW sections now place the watermain under the roadway. Most valves will now be under the roadway.

  *The paragraph regarding the location of valves has been deleted. With the proposed watermain in the roadway, valves will generally be in the roadway.*

- Workshop Presentation handouts stated increase in manhole spacing for pipes sized 250 to 450mm diameter; guideline states increases for all with two categories.

  *The manhole spacing adopted by the Region previously was maximum 100m for sewers 200mm to 450mm and 120m for sewers 525mm to 1050mm. The guidelines have increased the spacing on the smaller diameter sewers from 100m to 120m.*
Suggested Changes

- Detail Dwg for Watermain on Cul-De-Sac: If the 50mm watermain junctures were moved to past the hydrant, and the order of the hydrant and valve switched, it would be possible to shut off the services on the 50mm main and leave the hydrant still operational.

  *The purpose of the valve at the end of the 150mm watermain is to allow for the “flushing” of the 50mm copper watermain.*

- To item 2.6.6, it is suggested to add to the last paragraph regarding maintenance of street tree plantings, “or pay cash in lieu.”

  *The City at this time will not entertain the “cash in lieu” option on the maintenance of the landscaping works.*

Clarification Requested

- Item 2.4.1.3.b It appears as is if existing grades are required to be shown every 3 meters along the property line.

  *This clause has been re-written to clarify the requirements.*

- The determination of service locations for Storm and Sanitary is confusing. A 2.5m separation is required at all times according to Section 2.4.4.11. However, when using Section 2.4.3.5 to locate the storm and sanitary services, the right/left and North/East system seems to contradict, and leaves storm sewers with a smaller separation than the prescribed 2.5m.

  *Standard drawings outlining the servicing for single family, semi-detached, and quadroplex will form part of the guidelines and should clarify the spatial separation. A minimum of 2.5m horizontal separation must be maintained between the water service and the closest private drain.*

- Section 2.4.1.5, Item 3.1 states that watermains 400mm diameter and larger must be shown on the profile view. Are the other watermains not required to be shown? Even a 300mm watermain is a common size not to be included on the drawings.

  *The guidelines only require that the watermain be shown in profile for mains 400mm and greater. The designer may elect to show the watermain in profile for mains smaller than 400mm or may show those locations where there are services crossing.*

Should you have any questions or concerns, please do not hesitate to contact the undersigned.
Yours very truly,
PLANNING & ENGINEERING INITIATIVES LTD.

Brian Enter, P.Eng.
Municipal Engineer

BE/jm
Section 2.4 (f) (Page 8)
Agree. This should be addressed in the Parkland Dedication Policy that is currently in progress.

Section 2.4 (Page 7) Third Paragraph
Agree. Revise wording to read “stating”, not “certifying”.

Section 2.4.2 Sanitary Sewer Design (Page 18)
The sanitary sewer design requirement not to exceed 75% of the design capacity is only applicable on new sanitary sewers. This “safety” factor has been established by our Public Works Department, Water and Wastewater Division, Operational Planning Section.

Section 2.4.2.8 Sanitary Private Drains (Page 21)
The Sewer By-Law does not permit shared services. The by-law requires each lot to have a separate private drain and yard sewer.

Section 2.4.3 Storm Sewer Design
Comment has been noted and will be reviewed upon the completion of the Storm Drainage Policies and Criteria.

Section 2.4.4.9 Pipe Material and Bedding (Page 31)
Agree. PVC pipe is permitted in both corrosive and non-corrosive environments.

Section 2.4.4.10 Thrust Blocks and Mechanical Joint Restrainers (Page 32)
The requirement for thrust blocks is consistent with requirements from the City’s Public Works, Design and Construction Section on capital work projects.

Section 2.4.5
No change to the width of the pavement on major collector roads. It should be noted that the City contributes towards the cost of the over-sized roads greater than 8.0m in width.

Section 2.4.5.1 Geometric Standards (Page 35)
Standards for rural roads will be incorporated into the guidelines.

Section 2.4.5.2 Asphalt Placement dates (Page 38)
The time restrictions for the placement of the surface course asphalt are consistent with the time frame documented in the Subdivision Agreement. It should be noted that placement outside of these dates may be obtained from the Manager of Development Engineering.

Section 2.4.5.3 Adjustments (Page 38)
Final adjustments for manholes, catch basins, and water chambers using concrete has been used by the Public Works Department and they have not experienced problems with frost heaving.

Section 2.4.5.4 Curbs and gutters and subdrains (Page 39)
It should be noted that approval may be obtained from the Manager of Development, subject to weather conditions to place curbs and gutters after November 15th.

Section 2.4.5.5 Sidewalks (Page 40)
It should be noted that approval may be obtained from the Manager of Development, subject to weather conditions to place sidewalks after November 15th.

Section 2.4.5.6 Roadway Cross Sections (Page 41)
The pavement width for a major collector road is 11m, (not 12m).
Section 2.4.5.7 Driveway Aprons (Page 41)
The City will not require the Developer to provide a concrete apron approach. The City will include a recommendation in their report to Council on the Development Engineering Guidelines to amend the Subdivision Agreement to include a clause that the construction and maintenance of the approach will be the responsibility of the homeowner.

Section 2.4.5.9 Hydro and Street Lighting (Page 42)
It is the City’s preference to maintain the same standards in the different districts, however they will entertain “approved equivalent” products.

Section 2.4.5.11 Catch Basins and Connections (Page 43)
Recognizing that it may not always be possible to maintain the minimum grade of 1% on the rear lot catch basin leads, the guidelines have been revised to include the following:

“If the minimum 1% grade cannot be met, the Engineer shall justify the pipe design to the City”.

Section 2.4.5.12 Cul-de-Sacs (Page 44)
The minimum radius for the turning circle will remain at the proposed 13m. This standard was established in consultation with various Departments in the City. This issue has been discussed at length at previous liaison meetings and will remain with a 13m radius.

Section 2.4.5.13 Temporary Turning Circles (Page 44)
The radius to remain at 13m to be consistent with the permanent cul-de-sacs.

Section 2.4.7 Easements (Page 47)
The City will adopt the following easement widths:

• 9m for one sewer, however, a reduction to a minimum of 6m may be considered depending on the depth and size of the sewer
• 9m for dual sewers
• 4.5m for a watermain
• 10m for a watemain and a sewer
• 12m for a watermain and dual sewers

Section 2.5.2 Design Criteria (Page 49)
Rear yard catch basins in the former City of Hamilton have been designated as “private” and the City has elected to adopt this across the new City. A reduced grade of 1.5% with a sub-drain is permitted.

Please note that that these design criteria for the lot grading is applicable for single family and semi-detached lots. The maximum 4 lots draining into a rear yard catch basin will not apply to street townhouses.

Section 4.1.1 Sanitary Sewers, Storm Sewers & Watermains (Page 63)
Over-sizing limits for sanitary sewers and watermains will remain at 450mm and 300mm respectively. The over-sizing limit for the storm sewer will be reviewed upon the completion of the stormwater criteria and policy study. This will be dependent on the rainfall intensity curve that will be selected for the City.

Table 4.1 (Page 70)
The figures listed in Table 4.1 will be reviewed every 3 to 5 years.

Section 4.4.5 Payment for Future Urbanization of the Existing Rural Roads (Page 69)
Please note that the City will collect a cash payment from a Developer to urbanize rural roadways if the roadway is within the Urban Area Boundary as defined by the Official Plan.

February 27, 2003
From: Jim Enos [jenos@philipseng.com]
Sent: January 15, 2003 12:11 PM
To: adi@ajclarke.com
Subject: Comments On 'Development Engineering Guidelines'

pg. 1 - sp 'diviate' deviate

Spelling corrected.

pg. 14 - 3.1 '400mm' or 300mm? see 3.5

The guidelines only require that the watermain be shown in profile for mains 400mm and greater. The designer may elect to show the watermain in profile for mains smaller than 400mm or may show those locations where there are services crossing.

pg. 16 - 2.4.1.9 'moisture content' on profile?

Reference to moisture content has been deleted.

pg. 30 2.4.4.6 valves will always be in paved portion at 7.0m offset

how will they now be arranged?

Valves will always be in the paved portion of the roadway and will be located at the projection of the intersecting street line.

pg. 49 2.5.2.b is 5% the slope of the side yard swale from the rear corner of the house or is it from finished grade at the rear of the dwelling?

It is from the finished grade at the rear of the dwelling.

what is minimum acceptable slope for rear yard swales? ie. swales that run along the rear lot line?

The minimum acceptable slope for rear yard swales is 2%.

is there a flatter allowance with subdrains?

Yes, a 1.5% slope is permitted provided a subdrain is installed below the bottom of the swale.

pg. 50 2.5.3 what is current policy for surface drainage flowing from rear yard of one lot through to the front yard of rear abutting lot?

Drainage from one rear yard through the front yard of a rear abutting lot is permitted, provided the adjacent lot is part of the same development (refer to item 2.5.2 (i)).

I have not reviewed (nor will I) the comments in depth but found them to be generally well thought out and reasonably thorough.

Jim
Appendix ‘G’

Sidewalk Requirements for Highvalley Road, Woodhaven Place, Greenview Drive, and Deervalley Drive