



Hamilton

Terms of Reference for:

**Fruitland-Winona
Block Servicing Strategy
BLOCK 2**

September 2014 - FINAL

Introduction

The Fruitland-Winona Secondary Plan area is characterized by a relatively flat topography which requires specific grading and detailed servicing provisions to adequately service the future development area so development proceeds in a coordinated and comprehensive manner. The purpose of this study is to develop a Block Servicing Strategy (BSS) for areas identified in the Fruitland-Winona Secondary Plan – Block Servicing Strategy Area Delineation is shown in **Appendix A**.

The Fruitland-Winona Block Servicing Strategy shall be carried out in accordance with the Fruitland-Winona Secondary Plan. Review the Fruitland-Winona Secondary Plan when developing work plan. This Terms of Reference provides an overview of the requirements of the Block Servicing Strategy.

There are three (3) blocks included in the Fruitland-Winona Secondary Plan which require a Block Servicing Strategy:

Block 1: Generally located by Barton Street to the north, Highway 8 to the south, Fruitland Road to the west and east of Jones Road to Stoney Creek numbered watercourse 6. **(NOT TO BE COMPLETED AS PART OF THIS RFP)**

Block 2: Generally located by Barton Street to the north, Highway 8 to the south, watercourse 6 at the west, and Glover Road to the east.

Block 3: Generally located north of Barton Street, Highway 8 to the south, McNeilly Road at the west and east of Lewis Road. **(NOT TO BE COMPLETED AS PART OF THIS RFP)**

The Fruitland-Winona Subwatershed Studies shall form the basis of all Block Servicing Strategies. The BSS shall conform to the vision, objectives and policies of the approved Fruitland-Winona Secondary Plan and shall identify the land use designations, densities and natural heritage features, including Vegetation Protection Zones and Restoration Areas, in accordance with the Secondary Plan. Where it can be achieved, the Block Servicing Strategy shall comply with the Fruitland-Winona Secondary Plan Urban Design Guidelines.

The Block Servicing Strategy shall have regard for existing development in accordance with the Fruitland-Winona Secondary Plan by reflecting the general scale and character of the established development pattern in the surrounding area by taking into consideration lot frontages and areas, building height, coverage, mass, setbacks, privacy and overview. All development within the lands identified as the "Servicing Strategies Area" in the Fruitland-Winona Secondary Plan – Block Servicing Strategy Area Delineation shall conform to the Block Servicing Strategies.

The Block Servicing Strategy will be used in assessing priorities among proposals for development. The preliminary grading plan, layout of local roads, sanitary sewers, storm sewers and stormwater management facilities, watermains shall be defined, together with the phasing of servicing proposed to ensure development is achieved in an efficient and systematic manner within each block area.

The Block Servicing Strategy shall follow the Municipal Class Environmental Assessment Planning process. A public consultation plan shall be developed including the number of meetings to be held with the public and stakeholders.

This Terms of Reference will be for BLOCK 2: Generally located by Barton Street to the north, Highway 8 to the south, watercourse 6 at the west, and Glover Road to the east. SEE APEENDIX A for boundary.

Key Tasks & Deliverables

This study is intended to outline the concepts for the servicing of the Fruitland-Winona lands located south of Barton Street, east of Fruitland Road, west of Fifty Road, and north of Highway No. 8.

The Block Servicing Strategy shall include an integration of a Functional Stormwater Management and Environmental Management Plan, and a Functional Servicing Plan forming one comprehensive document. The Environmental Management Plan shall build on the findings of the final sub-watershed study for Stoney Creek Urban Boundary Expansion (SCUBE) watercourses.

The Block Servicing Strategy shall include the following tasks:

1. Functional Stormwater Management and Environmental Management Plan; and a
2. Functional Servicing Plan

1. Functional Stormwater Management and Environmental Management Plan

The Functional Stormwater Management and Environmental Management Plan is intended to build upon the baseline information contained in the subwatershed study and shall be implemented in support of the secondary plan. This study shall address any gaps identified in the subwatershed plan related to servicing, stormwater management and natural heritage features. The level of study would focus on integrating servicing and stormwater management to a greater level of detail than is normally achieved through the subwatershed study.

Stormwater management facilities shall comply with the City's Criteria and Guidelines for Stormwater Infrastructure Design and Policies, the Fruitland-Winona Sub-watershed Studies. In addition, stormwater management facilities:

- shall be located and designed to maintain ecological functions of the Natural Heritage features;
- shall be located adjacent to the Barton Street Pedestrian Promenade and other Open Space Designations where possible;
- shall be designed to provide visual attraction and passive recreation where possible.

The principle objectives and tasks required for a Functional Stormwater Management and Environmental Management Plan include but not limited to:

- a. Review final sub-watershed study for SCUBE watercourses. Re-running of the models from the sub-watershed study using the proposed level of impervious coverage and stormwater controls to confirm the existing targets are sufficiently robust to control the increased impervious arrears without causing an increase in downstream flooding and erosion and water quality compliance in accordance with MOE guidelines.
- b. Establish basic sub-watershed conditions (peak flows, runoff volumes, and erosion threshold assessment)

- c. Determine the preliminary design of the stormwater management systems including the outlet design at each location. This shall include:
 - i. Volumetric sizing
 - ii. Stage/storage/discharge relationship
 - iii. Volume calculations at various facility stages
 - iv. Outlet control calculations – drawdown time
 - v. Forebay dispersion length
 - vi. Minimum forebay deep zone bottom width
 - vii. Length/width ratios
 - viii. Decanting area
 - ix. Maintenance access route to inlet and outlet structures and forebay
 - x. Overland flow route to main pond
 - xi. Detailed gradients for trunk major and minor system (vertical control)
 - xii. Hydraulic grade line (HGL) assessment for storm sewer system.
- d. Functional grading and drawings (plan and profile) for each stormwater management facility.
- e. Capacity assessment of the receiving system for the proposed storm outlet/SWM facility.
- f. Identify drainage constraints relating to existing and post-development flows
- g. Screen various stormwater management strategies and techniques and evaluate a reasonable range of alternatives in consideration with the treatment train approach.
- h. Recommend stormwater management solutions based on sound evaluations of the natural, social and economic environments of various feasible alternatives.
- i. Prepare general drainage plans, outlining both the major and minor systems along with detailed flow limits at critical points.
- j. Identify opportunities to integrate passive recreation opportunities with stormwater management strategy.
- k. Identify opportunities for phasing of construction of stormwater facilities.
- l. Functional design of proposed realignment of watercourses.
- m. Identify techniques and recommend appropriate options to achieve infiltration targets through Low Impact Development (LID) at source in accordance with the subwatershed recommendation.

The Functional Stormwater Management and Environmental Management Plan shall have regard to ecological, hydrological, air drainage and road geometry assessments.

Ecological Assessment

The components of the ecological studies shall include:

- a. Meander Belt Width Assessments for all watercourses;
- b. The identification and consideration of all areas regulated by the Conservation Authority's Development, Interference with Wetlands; Alterations to Shorelines and Watercourses Regulation or its successor; and,
- c. Scoped Environmental Impact Statement EIS including evaluation of natural areas (Core Areas).
- d. Topographic survey of the lands including the staked limit of wetlands and top of bank of watercourses.
- e. Determination of top of stable slope of watercourses.
- f. Determine limits of buffers to watercourses and wetland.
- g. Hydraulic study of watercourses and determination/verification of flood plain limits.
- h. Geotechnical assessment to determine stable slope of the watercourse.

Hydrogeological Assessment

The stormwater management finding/recommendations from the SCUBE sub-watershed study shall be reviewed and incorporated in the Block Servicing Strategy. In addition, the hydrological investigation shall include:

- a. Water balance study.
- b. Groundwater levels and flow path.
- c. Significant recharge and discharge zones.
- d. An assessment of the impacts of development on the functions of b & c above.
- e. The foundation drain flow rate based on groundwater and severe wet weather conditions.
- f. Recommendation for an appropriate sump pump design.
- g. A contingency plan to ensure that an appropriate mitigation strategy can be implemented where:
 - An aquifer is breached during construction;
 - Groundwater is encountered during construction;
 - Continuous running of sump pump occurs; and,
 - Negative impacts occur on the water supply and sewage disposal system or any surface and groundwater related infrastructure.

Air Drainage Analysis

The Air Drainage Analysis Brief shall include:

- a. A review of the existing conditions, including air photos, topography, thermal conditions, climate and air movement down the Niagara Escarpment and towards Lake Ontario, to evaluate the effects of the proposed Secondary Plan land use on the existing microclimate and airflow; and,
- b. Where appropriate, propose a road layout and development patterns that maximize air drainage in a north/south alignment to minimize potential negative impacts on the tender fruit area to the south.
- c. The Air Drainage Analysis is to be prepared by a qualified environmental engineer with additional information being provided by a climatologist and argologist who are specialized in the field of tender fruit and grape production.

2. Functional Servicing Plan

The Functional Servicing Plan is intended to identify the manner in which water, sanitary and storm servicing is to be provided for. The plan generally includes, but is not limited to

- a. Defining the sanitary and storm drainage area boundaries and confirming capacity of the outlets and conveyance systems
- b. Finalizing the land-use plan through the establishment of local and collector road locations
- c. Functional design of all existing collector roadways within the Block, including potential utility conflicts and horizontal and vertical alignment
- d. Location and preliminary sizing of sanitary sewers
- e. Location and preliminary sizing of storm sewers
- f. Location and preliminary sizing of watermains
- g. Preliminary grading plan based on the proposed road pattern
- h. Location and functional design of stormwater management facilities
- i. Location and preliminary sizing of hydraulic structures (i.e. bridges and culverts)
- j. Preliminary channel grading plans and supporting analyses
- k. Watermain Analysis of Block Plan using City-wide WaterCad Model.
- l. Proposed phasing scheme.

- m. Internal infrastructure design (storm, sanitary and water main) should account for future growth beyond the limits of the study area.

Road Geometry

The Block Servicing Strategy shall include the development of a transportation network for local roads in consideration of the existing and proposed collector roadways identified in the Secondary Plan.

The following shall apply to new road crossings:

- Where possible, road crossings shall avoid significant and/or sensitive natural features;
- Where it is not possible for road crossings to avoid significant and/or sensitive natural features, road crossings may be located in previously disturbed watercourse reaches or in locations where the disturbance or removal of riparian vegetation can be minimized. All watercourses will need to recognize inputs from meander belt analyses, flood plain analyses and fisheries at a minimum;
- New roadway culverts and bridges shall have sufficient conveyance capacity to pass 100 year event to avoid adverse backwater effects. In addition, under Hurricane Hazel event the maximum flooding depth on road shall be in accordance with MNR's technical guidelines;
- Where new roadway culverts and bridges cannot meet the requirements set out above, Regulatory flooding depths on roadways shall be based on the standards within the Ontario Ministry of Natural Resources Natural Hazards Technical Guides, latest version or its successor guideline; and,
- If a minor realignment of the stream channel is necessary to achieve the desired crossing configuration, the new channel should be established using natural channel design principles.

Notes:

The findings and solutions identified in the individual drainage and flooding assessments shall be integrated into the Block Servicing Strategies and subsequent Draft Plan of Subdivision.

ADDITIONAL TASKS:**BLOCK 1(NOT TO BE COMPLETED AS PART OF THIS RFP)**

- Include functional design for Jones Road
- Determine the floodplains for:
 - Along Watercourse 5.0, immediately downstream of Fruitland Road (between sections 2221 and 2150); and
 - Along Watercourse 5.0, halfway between Highway No. 8 and Barton Street (between sections 1693.967 and 1537.457)
- Through the Schedule C Class Environmental Assessment process, determine the alignment for the north/south (new Fruitland Road) road between highway No. 8 and Barton Street.
- Local flooding issue remediation required:
 - Local flooding at 688 Barton Street (private property drainage issue).
 - Local flooding at 728 Barton Street (private property drainage).
- Specific natural heritage requirements for the Block Servicing Strategy:
 - Ecological Land Classification and Vegetation Surveys
 - Update SCUBE West Subwatershed Study Phase 1 & 2.
 - Fisheries and Watercourse Assessments on Watercourses 5, 6 & 7
 - Re-alignment of watercourse 5 may require additional studies.
 - Re-alignment and re-construction of Watercourse 5.0 upstream of Barton Street would identify design measures to avoid/mitigate the potential negative effects of the proposed stream relocation on existing natural heritage features and functions; avoid/mitigate the potential negative impacts to wetlands 1 and 4.
 - Define limits of natural heritage feature boundaries.
 - Review the widths of the preliminary vegetation protection zone (VPZ) that have been established within the Subwatershed Study.
 - Drainage and infrastructure improvement works:
 - Identification of design measures to avoid/mitigate the potential negative effects of the proposed channel improvements on

existing natural heritage features and functions.

Block 2

- Include functional design for Glover Road
- Determine the floodplains along Watercourse 6.0, downstream of Highway No. 8 (between sections 2232.182 and 1785.033).
- Local flooding issue remediation required:
 - Local flooding at 808 Barton Street.
- Specific natural heritage requirements for the Block Servicing Strategy:
 - Ecological Land Classification and Vegetation Surveys
 - Update SCUBE West Subwatershed Study Phase 1 & 2.
 - Define limits of natural heritage feature boundaries.
 - Review the widths of the preliminary vegetation protection zone (VPZ) that have been established within the Subwatershed Study.
 - Drainage and infrastructure improvement works:
 - Identification of design measures to avoid/mitigate the potential negative effects of the proposed channel improvements on existing natural heritage features and functions.

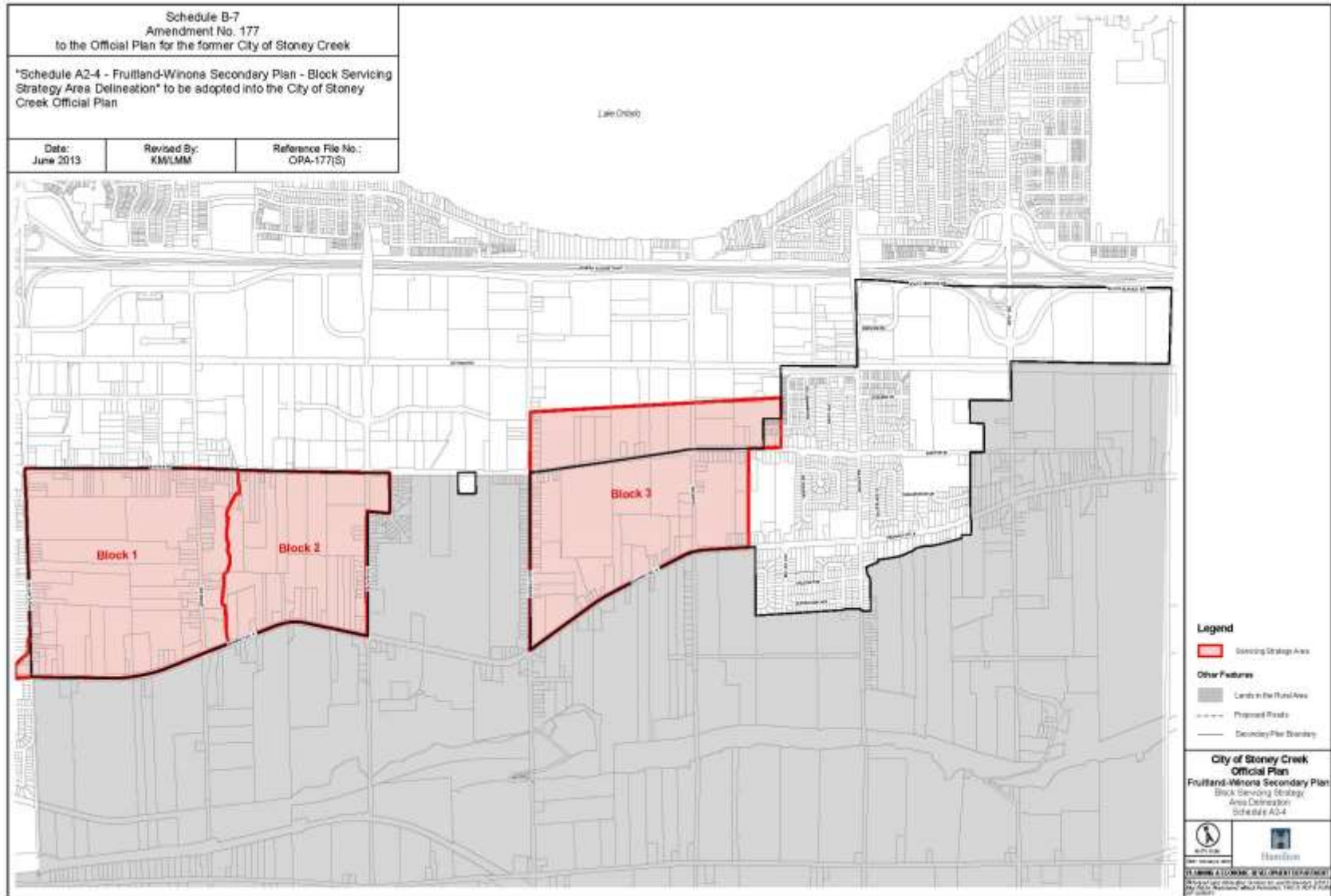
Block 3 (NOT TO BE COMPLETED AS PART OF THIS RFP)

- Include functional design of McNeilly Road and Lewis Road
- Local flooding issue remediation required:
 - Local flooding at 1028 Barton Street (groundwater issue).
- Specific natural heritage requirements for the Block Servicing Strategy:
 - Ecological Land Classification and Vegetation Surveys
 - Update SCUBE East Subwatershed Study Phase 1 & 2.
 - Define limits of natural heritage feature boundaries.
 - Review the widths of the preliminary vegetation protection zone (VPZ) that have been established within the Subwatershed Study.
 - Drainage and infrastructure improvement works:
 - Identification of design measures to avoid/mitigate the potential negative effects of the proposed channel improvements on existing natural heritage features and functions.

Appendices

Appendix 'A'	Fruitland-Winona Secondary Plan – Block Servicing Strategy Area Delineation
Appendix 'B'	Reference Documents

Appendix 'A' Fruitland-Winona Secondary Plan – Block Servicing Strategy Area Delineation



Appendix B – Reference Documents

- Fruitland-Winona Secondary Plan (2014)

http://www.hamilton.ca/CityDepartments/PlanningEcDev/Divisions/Planning/CommunityPlanning/SecondaryPlans/FruitlandWinona/?WT.mc_id=fruitlandwinona&WT.hamilton_redirect_friendly=1

- SCUBE Sub-watershed Studies (2010)

http://www.hamilton.ca/CityDepartments/PlanningEcDev/Divisions/Planning/CommunityPlanning/SecondaryPlans/FruitlandWinona/?WT.mc_id=fruitlandwinona&WT.hamilton_redirect_friendly=1

- Breeding Birds Survey and Species at Risk (2012)
- City of Hamilton Engineering Guidelines for Servicing Land Under Development Applications (December 2012)
- City of Hamilton Storm Drainage Guidelines for Servicing Land Under Development Applications (December 2012)
- City of Hamilton Sewer and Water System Design Requirements (May 29th, 2014)