TOWN OF AJAX

DESIGN CRITERIA

SECTION A

GENERAL INFORMATION

A 1.00 INTRODUCTION

A 1.01 THE TOWN OF AJAX

The Town of Ajax is part of a two tier municipal governance model. The Town of Ajax is a lower tier municipality and, as such, is responsible for all roadways, storm sewers, and stormwater management infrastructure that are to be installed within all Town of Ajax road allowances and registered easements within The Town of Ajax. The Town is also responsible for all parks and open space on municipally owned lands.

A 1.02 REGIONAL MUNICIPALITY OF DURHAM

The Regional Municipality of Durham is responsible for all sanitary sewers and watermains plus appurtenances that are to be installed on all road allowances and registered easements within the Region of Durham. The Region of Durham is responsible for storm sewers within the Regional road allowance.

The Consultant shall contact the Region of Durham Works Department to obtain copies of the Regional Design Standards for sewers and watermains.

A 1.03 PURPOSE OF DESIGN CRITERIA

The purpose of this document is to provide a clear and concise description of the Town of Ajax's Engineering review processes and Engineering design standards. All development-related Engineering design proposals are to be prepared in a manner that conforms to the design criteria contained in this document. This document will be periodically updated to include revisions where required. All submissions will be required to conform to the latest revision. The latest revision can be viewed by accessing the Town of Ajax website at ***http://www.townofajax.com***.

A 1.04 SUBMISSIONS

Submission and circulation of engineering drawings related to planning approval is co-ordinated through the Town's Planning and Development Services Department. The developer is required to make the initial contact with the Manager of Planning or designate prior to submission of the Engineering drawings.

Approval of engineering drawings must be obtained from the Town's Engineering Section prior to commencement of any and all development works.

DEFINITIONS

"**CONSULTING ENGINEER"** or "**DEVELOPER'S ENGINEER**" means a professional engineer possessing a current certificate of authorization to practice professional engineering as required by the Professional Engineers Act. The consulting firm should also be a member in good standing of the Consulting Engineers of Ontario (CEO).

"DRAFT PLAN APPROVAL" means approval of a draft plan of subdivision by the Town of Ajax subject to certain conditions in accordance with the Planning Act. The conditions of approval are to be fulfilled in part by the Owner before entering into a subdivision agreement with the Town of Ajax.

"FUNCTIONAL ACCEPTANCE" shall be the terminology used to describe the date when the

underground services within the subdivision have been constructed and are without deficiencies that prevent them from operating as intended to the satisfaction of the Town.

"PRELIMINARY ACCEPTANCE" shall be the terminology used to describe the date when the services are complete and acceptable to the Town of Ajax subject to the maintenance requirements of the Subdivision Agreement.

"FINAL ACCEPTANCE" shall be the terminology used to describe the date when the Owner's maintenance requirements have been fulfilled and the services are acceptable to the Town of Ajax.

"FORMAL ASSUMPTION" shall be the terminology used to describe the date when the Town of Ajax's Council agrees by Bylaw that all the conditions of the Subdivision Agreement have been fulfilled and all the maintenance requirements have been completed.

"SOILS CONSULTING ENGINEER" - is a geotechnical engineering firm whose services have been engaged by the Developer or the Developer's Engineer, usually to provide predevelopment soils investigations as well as a quality control function through the servicing/ construction phase.

A 2.00 FAMILIARIZATION

Prior to commencement of the engineering design, the Consultant shall obtain up to date copies of the Town of Ajax Design Criteria and Standard Detail Drawings and the Design Services Standard Details Manual to familiarize themselves with the requirements of a subdivision and site plan design in the Town of Ajax. Meetings shall be held with Engineering and Planning staff to confirm external drainage areas, draft conditions and other data prior to commencement of the Engineering Design.

A 2.01 FUNCTIONAL REPORT

A functional report (feasibility study) is required in accordance with the Planning Act and the Town of Ajax's Official Plan for the draft approval of any plans of subdivision. A functional report may also be required, for other mid to large-scale developments potentially having an impact on servicing, grading, drainage, and traffic at the discretion of the Manager of Engineering.

Prior to the commencement of the Engineering Design and the Functional Report, the Owner's Engineer shall meet with the Engineering staff to discuss the Town's requirements and with the Region's Works Department to discuss the Region's requirements. It is suggested that when possible this be a joint meeting.

The functional report shall provide all details, calculations, costs, alternatives and recommendations necessary that decisions can be logically made.

In cases where the subdivision development under consideration forms part of a larger area set aside for future development, the functional report shall demonstrate that the servicing design will accommodate and allow for orderly and efficient future development.

The functional report shall be signed and sealed by a professional engineer.

The functional report shall include, all relevant background information with respect to Site Constraints and Existing Conditions such as, but not limited to:

- Topography and drainage

- All pipelines (Trans Canada, Enbridge, Union Gas etc.)
- Hydro easements / corridors
- Trunk sewers and watermains
- Utilities
- Environmental features (protected watercourses, top of bank, terrestrials)
- Road Networks

The Functional Report shall address, but will not necessarily be limited to, the following considerations:

(a) The Draft Plan of Subdivision
(b) Topography and drainage
(c) Site Servicing
(d) Stormwater Management Report, external drainage areas, overland flow routes watershed drainage areas and watercourse improvements and channelization
(e) Storm drainage systems, including Hydraulic Grade Line (HGL) constraints
(f) Soils Report/Geotechnical Investigations
(g) Major roadway alignments, cross-sections, right of way width, and intersections
(h) Traffic Impact Study
(i) Roadway structures
(j) Railway crossings
(k) Parkland development
(l) Major trunk sewers
(m) Sanitary drainage systems
(n) Water distribution systems
(o) Lot grading design, including overland flow route
(p) Pumping station locations
(q) Phasing
(r) Adjacent developments
(s) Environmental Impact Study (EIS)

The Functional Report shall contain the following:

(a) <u>The Draft Plan of Subdivision</u>

The Draft Plan must be in a form acceptable to the Planning Departments of the Regional Municipality of Durham and the Town of Ajax.

(b) <u>Contour Plan</u>

This plan shall be a plan at a scale of no larger than 1:1000 giving contour lines at sufficient intervals to permit assessment of existing surface drainage patterns. This plan is to extend to the limits of the drainage area to be served by proposed sanitary and storm sewer systems, including lands beyond the boundaries of the subdivision. All elevations shall refer to NAD 83 Geodetic Datum.

(c) <u>Conceptual Grading Plan</u>

This plan shall be at a scale of no larger than 1:500 showing a general outline of proposed grading, including overland flow routes.

(d) <u>General Servicing Plan</u>

This plan shall be at a scale of no larger than 1:1000 and will be based on the Draft Plan of Subdivision. The plan shall schematically show the proposed underground

services and their connection to existing systems. Direction of flow must be indicated on all sewers. This plan is to be accompanied by engineering calculations indicating the quantity of stormwater flow at the connection to existing systems and/or at proposed outfalls. Consideration must be given to the whole catchment area to ultimately be developed. Overland flow routing, proposed stormwater management facilities, blocks and easements for storm drainage systems shall also be shown.

(e) Soils Report/Geotechnical Investigation

A preliminary soils investigation and report from an independent Soils Consultant will be required by the Town. The soils report should include sufficient information so as to assess constructability of sewer systems, founding levels for buildings, engineered fill requirements, water table information and a recommended pavement structure

(f) Stormwater Management Report

This report must address the quality and quantity criteria for the watershed or sub-watershed within the proposed development. This report must also address any concerns from the area Conservation Authority and Ministry of Environment design criteria for stormwater management (Stormwater Management Planning and Design Manual, 2003). Minor and major storm systems and flow routes must be identified within the report. The pond block must be adequately sized such that the stormwater management facility meets all Town of Ajax criteria (Refer to Section C).

(g) Tree Inventory and Preservation Report

This report will clearly identify all existing plant material with a calliper of 60mm or greater by providing species, quantity, size, height, and condition. Indicate if the existing plant material is to be saved, removed or relocated. The location of existing plant material is to be surveyed and located on the plan by an Ontario Land Surveyor. The extent of the survey will be a minimum of 10m beyond the limits of the site. Details of how the plant material will be successfully preserved during construction and post construction must be clearly identified. This report shall be prepared by a certified arborist or licensed landscape architect.

(h) Additional Reports

The Town of Ajax may require a study and report which evaluates the geographical and hydro- geological characteristics of a rural area where private services are proposed. This study shall identify the suitability of the development area and its component sub-areas to safely accommodate private water supply and sewage disposal systems.

(i) Conditions Of Draft Approval

Through the evaluation of the draft plan of subdivision, the Town may impose conditions on a draft approval related to engineering design, phasing, construction requirements from submitted reports and other requirements. Through the review of detailed engineering submissions, the design of the draft plan may change to address proposed conditions. Applicants are advised that the Town may impose changes to the draft plan design in order to accommodate such circumstances subject to processing and notice requirements under the Planning Act.

(j) Street Naming

The Town of Ajax has a street name registry for all the new public and private streets and lanes in Ajax. New street names must be selected from that registry. Please contact the office of the Town of Ajax CAO for the latest registry.

A 3.00 SUBMISSIONS

Engineering drawings shall be submitted simultaneously to the Region of Durham and to the Town of Ajax. The Consulting Engineer is advised to review the Region of Durham's design criteria to determine the requirements for submission of engineering drawings to the Region's Works Department.

A 3.01 FIRST SUBMISSION TO THE TOWN OF AJAX

After approval of a planning application, the initial submission of engineering drawings for review by the Engineering section shall contain the following information:

A copy of a Geotechnical Investigation report prepared by a qualified Soils Consulting Engineer.

The initial submission of engineering drawings to the Town of Ajax shall contain:

(a) One copy of the approved draft plan, functional servicing report and approved Traffic Management Plan,

(b) Three copies of the proposed 40M- and 40R- Plans showing all lot and block numbering and dimensioning,

(c) A declaration from the Consulting Engineer indicating that he has been retained to design and supervise the construction of the work in the subdivision according to the terms of the Subdivision Agreement,

(d) Two sets containing just the General Plan of Services,

(e) Six complete sets of Engineering Drawings that include:
- Cover Page
- General Notes
- General Plan of Services
- Plan/Profiles for each street
- Lot Grading Plan
- Sediment and Erosion Control Plan
- Storm Drainage Plan
- External Storm Drainage Plan
- Storm Sewer Design sheets
- Detailed Stormwater Management Report
- Stormwater Facility Operational Manual,

(f) Three copies of a soils report/geotechnical investigation prepared by a qualified Soils Consulting Engineer,

(g) Three copies of the Noise Report,

(h) Three copies of the Tree Preservation Report and Plan,

(i) All detail drawings other than the O.P.S. Detail Drawings,

(j) All drawings pertinent to the design,

(k) All other calculations necessary to check the design.

The above information will be reviewed by the Town of Ajax once all required information has been submitted. One set of drawings and calculations will then be returned to the Consultant with any required revisions noted.

A 3.02 SUBSEQUENT SUBMISSIONS

Subsequent submissions of Items (d) through (j) inclusive shall be made until the engineering drawings and design is acceptable to the Town. These submissions shall contain the previous comments and mark-ups from the Town and:

- Two complete sets of revised Engineering Drawings
- Two copies of a Hydro Distribution System and Street Lighting
- Two copies of a Photometrics Plan
- Two copies of a Traffic Management Implementation Plan (TMIP)
- Two copies of the Revised Stormwater Design Sheets
- Three copies of the Landscape Drawings and Park Grading Plan, if necessary
- Two copies of the Utility Coordination Plan
- Two copies of any revised reports

The design of the electrical distribution system and street lighting shall be completed by the Owner's Electrical Consultant. This design shall be submitted to the Manager of Engineering and shall be approved prior to the final approval of the engineering drawings. The streetlight poles, standards, and lamps shall be to the Town of Ajax standards and approved by the Town. The location of the streetlight poles and transformers shall also be shown on the Utility Coordination Plan.

The consultant must also coordinate the planning and construction of the other utilities involved with the subdivision.

A 3.03 MINISTRY OF THE ENVIRONMENT APPLICATIONS

After the engineering design and drawings are in a state acceptable to the Town of Ajax, four copies of the Ministry of the Environment application form for the storm sewer system and one complete set of engineering drawings shall be submitted to the Manager of Engineering. Three copies of this application shall be signed by the Town of Ajax and shall be returned to the Consultant. The Consultant shall make application to the Region of Durham for the Ministry of the Environment approvals for the sanitary and water systems.

A 3.04 OTHER APPROVALS

The Consultant shall be required to make all submissions and representations necessary to obtain approval from all other authorities affected (Ministry of Natural Resources, Ministry of Transportation, Conservation Authorities, Fire Marshall, Medical Officer of Health, etc.). The Town of Ajax shall be kept informed of the progress of these submissions by copies of all correspondence.

A 3.05 ORIGINAL DRAWINGS

After all approvals have been received from all necessary agencies, the original drawings shall be submitted to the Town. These drawings shall be signed and dated by the Town indicating they have been reviewed by the Town of Ajax and returned to the Consultant. No changes or revisions may be made to the drawings after the signature of the Town has been affixed unless the revisions have been formally reviewed and accepted by the Town and initialled by the Town in the Revision Block.

If, after two years from the date of the original approval of the engineering drawings by the Town, the Developer fails to enter into a Subdivision Agreement with the Town of Ajax, the Town reserves the right to revoke all approvals related to the engineering drawings.

A 3.06 PREPARATION OF SUBDIVISION AGREEMENT

The draft of the Subdivision Agreement, as prepared by the Town of Ajax, will be completed and forwarded to the Owner upon written request to the Manager of Planning or designate. The final Subdivision Agreement will be prepared under the direction of the Manager of Planning or designate and will be executed by the Mayor and Clerk only after the receipt of all payments and securities to the satisfaction of the Finance Department.

The engineering drawings must be approved by the Town prior to the finalization of the Subdivision Agreement Schedules. Prior to commencement of preparation of the subdivision agreement the owner shall provide the Town of Ajax with the following:

(a) Ministry of Environment certificates of approval for Town services to be constructed for the proposed subdivision.

(b) The name of the person and/or company with whom the Subdivision Agreement will be executed.

(c) The name, address and telephone number of the Owner's lawyer.

(d) A breakdown of the number of units proposed within the subdivision, i.e.:

- Single detached units
- Semi detached units
- Townhouse units
- Apartment units
  - One bedroom and bachelor
  - Two or more bedrooms

(e) Six copies of the legal description of the subdivision based on the Reference Plan and approved by the Land Registry Office.

(f) Six full size and six legal size copies of the proposed final plan for registration (40M-Plan) complete with the street names, lot numbers, surveyor's certificate, owner's certificate, and all other pertinent information required by the Registry Office.

(g) Six full size and six legal size copies of the Reference (40R-) Plans for any easement to be granted to the Town.

(h) Six copies of the General Plan of Services.

(i) Six copies of a detailed cost estimate prepared by a professional engineer for services to be constructed for the subdivision. The cost estimate shall be signed and sealed by the professional engineer. A draft copy of the cost estimate shall be submitted to the Town for approval prior to preparation of the above noted copies. This cost estimate will be used as a basis for calculation of the security deposit (Schedule A of the subdivision agreement).

(j) One copy of the final tendered contract schedule of unit prices and specifications

(k) Six copies of a schedule identifying lands and easements to be deeded to the Town. A draft copy of the schedule shall be submitted to the Manager of Engineering for approval prior to preparation of the above noted copies (Schedule B of the subdivision agreement).

(l) Proposed phasing.

(m) List of all drawings required (Schedule H of the subdivision agreement).

A 4.00 ENGINEERING DRAWING REQUIREMENTS

A 4.01 All engineering drawings shall be prepared in a neat and legible fashion. The design information presented on these drawings shall be completed in metric.

A 4.02 All original engineering drawings shall be prepared on 3 mil drafting film (Mylar) with a matte surface on the working side. As constructed drawings shall also be submitted in electronic format, AutoCad 2006 or later, and PDF format for the archives. Refer to the Regional Municipality of Durham, Design Specifications for Cad Drawing Standards.

A 4.03 The reference Geodetic Bench Mark and the Site Bench Marks to be used for construction shall be identified on the General Plan of Services and in the General Notes. All elevations shown on the engineering drawings are to be of Geodetic origin NAD 83. A minimum of 2 benchmarks of geodetic origin are to be shown on the plans

A 4.04 A Key Plan at a scale of 1:10,000 shall be shown on the top right hand corner of all drawings, and the area covered by the drawing shall be clearly identified.

A 4.05 The standard Town of Ajax title block as shown in the detail drawings shall be used on all engineering drawings (see AS-500).

A 4.06 All drawings shall be prepared on standard A1 sheets (594 mm x 841 mm).

A 4.07 Stamps, tapes, and stick-on labels shall not be used except for the Professional Engineer's stamp.

A 4.08 The lot numbering and block identification on all engineering drawings shall be the same as shown on the Registered Plan for the area. All road allowances, lots, blocks, easements and reserves shall be shown and identified on all engineering drawings in the same manner as the corresponding Registered Plans.

A 4.09 When the information presented exceeds the limits of the page and requires more than one drawing, match lines and corresponding reference drawing number shall be used with no overlapping of information.

A 4.10 A north arrow shall be referenced on all drawings.

A 4.11 All final approved engineering drawings shall be stamped and signed by a professional engineer.

A 5.00 COVER PAGE

A 5.01 The Cover Page shall list the name and phase of the development, Town of Ajax file number, Regional file number, list of drawings, key plan of site, and consultant's name.

A 6.00 GENERAL PLAN OF SERVICES

A 6.01 A General Plan of Services Drawing shall be prepared for all developments at a scale of 1:1,000 maximum.

A 6.02 When more than one General Plan of Services Drawing is required for any development, then the division of drawings shall reflect the limits of the Registered Plans as closely as possible.

A 6.03 An index of all drawings associated with the development shall be shown on the Cover Page.

A 6.04 All road allowances, street names, lots, blocks, easements and reserves shall be shown and identified in the same manner as the Registered Plan.

A 6.05 All existing services, utilities and abutting properties shall be shown in dotted lines.

A 6.06 All services to be constructed shall be shown in solid lines.

A 6.07 All storm and sanitary sewers shall be shown, identifying length, size, grade, type and direction of flow (of existing and proposed).

A 6.08 All manholes and catchbasins are to be shown and numbered in accordance with the design sheets.

A 6.09 All watermains, valves, hydrants, and blow-offs shall be shown. Watermains shall be identified by size.

A 6.10 All curbs and sidewalks shall be shown.

A 6.11 All fencing is to be indicated by the height and type of fence.

A 6.12 Dimensioning of utilities and roadways is not required.

A 6.13 Registered Plan number must be shown on the As-Constructed General Plan of Services Drawings.

A 6.14 All sites for parks, schools, churches, commercial, and industrial development must be shown and identified by use.

A 6.15 If a subdivision encroaches on an existing floodplain, the approved screening limit restrictions must be shown, as specified by the local conservation authority.

A 6.16 The reference Geodetic Bench Marks and the Site Bench Marks to be used for construction shall be identified.

A 7.00 PLAN AND PROFILE DRAWINGS

It should be understood that whereas the following specifies Ajax's requirements, it should be understood that all infrastructure regardless of final ownership shall be shown on the Plan/profile drawings.

A 7.01 All Plan and Profile Drawings shall be prepared at a scale of 1:500 horizontally and 1:50 vertically.

A 7.02 Plan and Profile Drawings are required for all roadways, blocks and easements within the development, for all outfalls beyond the development to the permanent outlet, for all boundary roadways abutting the development, and for other areas where utilities are being installed below grade.

A 7.03 All Plan and Profile Drawings shall be prepared so that each street can be filed separately. The street names shall be identified on the plan portion of the drawings.

A 7.04 The reference drawing numbers for all intersecting streets and match lines shall be shown on all Plan and Profile Drawings.

A 7.05 All existing or future services, utilities, and abutting properties shall be shown in dotted or dashed lines.

A 7.06 All services to be constructed shall be shown in solid lines.

A 7.07 The profile portion of the drawing shall be a vertical projection of the centre line whenever possible.

A 7.08 All road allowances, pavement widths, lots, blocks, easements and reserves, including dimensions, shall be shown and identified in the same manner as the Registered Plan. Lot and block frontages shall be shown.

A 7.09 All curb and gutter (to be shown with a double line) and sidewalks shall be shown and dimensioned on the plan portion of the drawing.

A 7.10 All storm sewers shall be shown and dimensioned on the plan and shall also be plotted on the profile of the drawings. The sewers shall have a complete description on the profile portion of the drawing including length, grade, material, class of pipe and bedding requirements. The plan portion of the drawing shall indicate size and direction of flow. The size of the pipe shall be plotted to full scale on the profile. The sanitary sewers and watermains are the responsibility of the Region of Durham and will require the approval of the Region's Works Department.

A 7.11 All storm sewer manholes shall be shown on the plan and on the profile portion of the drawing. The manholes shall be identified by number and shall make reference to the applicable OPSD or to a special detail on the profile portion of the drawing. All invert elevations shall be shown on the profile with each having reference to the north arrow.

A 7.12 All catchbasins and catchbasin leads shall be shown. Pipe diameter for catchbasin leads shall be identified on the plan portion of the drawing if it differs from the standard.

A 7.13 Safety platforms and corresponding proposed elevations to be noted in the profile portion of the drawings for all storm sewer manholes requiring them.

A 7.14 All drop connections shall be noted and referenced to the Standard Detail Drawing, including sizing and inverts.

A 7.15 All rim and invert elevations for rear lot catchbasins and catchbasin/manholes shall be shown. Provide RLCB lead detail, showing the slope line of influence using a 1:1 slope from the bottom of the pipe.

A 7.16 Storm sewer manhole benching details shall be shown at a scale of 1:50 whenever the OPSD are not applicable.

A 7.17 All sanitary sewers and watermains, including any/all appurtenances, to be shown, described and dimensioned on the portion of the drawing as per the design criteria requirements of the Region's Works Department. In addition, the watermains shall be plotted to full scale size on the profile portion of the drawing and described.

A 7.18 Notwithstanding, the above location of all storm, water and sanitary service connections shall be shown on the plan portion of the drawing using different symbols for each service. These services need only to be dimensioned when the location differs from the standard location as shown on the Town of Ajax Standard Detail Drawings. The connections to all blocks in the development shall be fully described and dimensioned (size, length, grade, invert elevations, materials, class of pipe, bedding, etc.).

A 7.19 The centre line of construction with the 20 m stations noted by a small cross shall be shown on the plan portion of the drawing.

A 7.20 The original ground at centre line and the proposed centre line road grade shall be plotted on the profile. The proposed centre line road grade shall be fully described including: length, grade, P.V.I. station and elevation, vertical curve data (K-value, length, P.V.I., B.V.C., E.V.C., high point and/or low point station, and elevations). In addition, intermediate stations and elevations shall be labeled on the profile at 5 metre intervals through all vertical curves.

A 7.21 Chainages for the centre line of construction shall be shown on the plan portion and profile portion of the drawing. The horizontal curve B.H.C., E.H.C., chainages shall be noted. The curve data (angular deflection, radius, tangent, length and chord) shall be noted also.

A 7.22 The proposed pavement design shall be noted on the plan portion of each road drawing.

A 7.23 Special notes necessary to detail construction procedures or requirements shall be shown.

A 7.24 Basement elevations for all existing dwellings to be shown and noted on the profile portion of the drawings. Proposed minimum basement elevations to be determined for all lots created through the development and noted on the Lot Grading Plans.

A 7.25 All existing services, utilities and features shall be shown on the plan portion of the drawing. Those services and utilities below grade that are critical to the new construction shall also be shown in the profile. Test holes may be required to determine actual elevation of these services and utilities.

A 7.26 The curb radii at all intersections shall be shown on the plan portion of the drawing.

A 7.27 Profiles of roadways shall be produced sufficiently beyond the limits of the proposed road, to confirm the feasibility of possible future extensions.

A 7.28 Details showing gutter grades for all intersections, cul-de-sacs, 90 degree crescents and horizontal curves where the centreline grade is less than 1%, shall be provided on the plan portion of the drawing as a separate detail at a scale of 1:500.

A 8.00 OTHER DRAWINGS

A 8.01 LOT GRADING PLANS

All lot grading plans shall be prepared in accordance with the criteria given in Section E.

A 8.02 STORM DRAINAGE PLANS

All drainage plans for storm sewer design shall be prepared in accordance with the criteria given in Section C.

A 8.03 LANDSCAPE PLANS

All landscape plans shall be prepared in accordance with Sections G and H of this manual utilizing graphic media as described in sub-sections A3.01 and A3.02. All landscape plans are to be prepared and stamped by a licensed Landscape Architect registered with the Ontario Association of Landscape Architects (O.A.L.A.).

A 8.04 TREE INVENTORY AND PRESERVATION PLAN

All tree inventory and preservation plans shall be prepared by a certified arborist or by a licensed Landscape Architect registered with the Ontario Association of Landscape Architects. The plan shall incorporate all requirements of the tree preservation report and include all details and notes.

A 8.05 DETAIL DRAWINGS

The Town of Ajax Standard Detail Drawings shall be utilized whenever applicable. The use of the latest revision of the Ontario Provincial Standard Drawings may be utilized when approved by the Manager of Engineering. These drawings need not be reproduced as part of the engineering drawings for the development, but must be referred to by number on the affected Plan and Profile Drawings. The Consultant shall be responsible for checking the suitability of the details provided on the Town of Ajax Standard Detail Drawings for the application proposed. Individual details shall be provided by the Consultant for all special features not covered by the Town of Ajax Standard Detail Drawings.

These special details shall be drawn on standard sized sheets and shall be included as part of the engineering drawings. The minimum scale to be used for any manhole or sewer detail shall be 1:50.

A 8.06 SEDIMENT AND EROSION CONTROL PLAN

All Sediment and Erosion Control Plans shall be prepared in accordance with the criteria given in Section L.

A 8.07 UTILITY COORDINATION PLAN

All Utility Coordination Plans shall be prepared in accordance with the criteria given in Section M.

A 8.08 TRAFFIC MANAGEMENT IMPLEMENTATION PLAN (TMIP)

All Traffic Management Implementation Plans shall be prepared at a scale of 1:500 and in accordance with the criteria given in Section F.

A 8.09 CROSS SECTION PLANS

Cross sections will be required along all external roads when adjacent to proposed developments.

All Cross Section Plans shall be limited to 10 sections per sheet, at a scale of 1:50 vertical, 1:200 horizontal.

Cross sections will be required every 20 m and at every driveway.

Cross sections will indicate all right of way limits, grading limits, driveway restoration limits, all above ground features (such as trees, hydro poles, etc), culverts, and existing and proposed roads, including road make-up.

A 8.10 REMOVAL PLANS

All Removal Plans shall be prepared at a scale of 1:500.

Removal Plan will indicate area of full depth road excavation and sidewalk, asphalt, curb, culvert, tree, etc. removals.

A 9.00 REQUIREMENTS PRIOR TO COMMENCEMENT OF CONSTRUCTION

Prior to commencement of construction, the Owner's Consulting Engineer shall submit the following information to the Manager of Engineering:

a) Four sets of all approved engineering, landscaping, and electrical drawings (one full size and three at 50% reduction) and one digital copy of the plan

b) One copy of the construction specifications
c) The proposed contractor.

d) Copy of the signed contract between Contractor and Owner.

e) All other information specified in the Subdivision Agreement as a requirement prior to commencement of construction or other information required by the Manager of Engineering.

Following submission of these materials, a pre-construction meeting shall be arranged and held

prior to commencement of construction.

A 10.00 ACCEPTANCE

A 10.01 FUNCTIONAL ACCEPTANCE

The term Functional Acceptance shall be used to describe the date when the underground services within the subdivision have been constructed and are without deficiencies that prevent them from operating as intended to the satisfaction of the Town.

The following must be completed to the satisfaction of the Town prior to issuance of the Functional Acceptance Certificate:

a) A certificate from the Consulting Engineer that the services included in this agreement have been constructed and installed in accordance with the approved design drawings, specifications, standards, and requirements,

b) Storm sewers shall be flushed, cleaned, and inspected by CCTV with reports and video(s) submitted to the Town for review,

c) Rear yard catch basins have been certified by an O.L.S. that they have been installed in the correct location,

d) Storm water management facilities are constructed as designed,

e) Roads have been constructed with base curb, base asphalt, and connect to an existing publicly maintained road,

f) Installation of Street name and traffic control signs,

g) Installation of unassumed road and utility information signs,

h) Construction of emergency access routes,

i) Overland flow routes have been graded and fenced to prevent them from being blocked by excavated material or building materials,

j) The Town has been notified by the Region of Durham that the sanitary sewer and watermain systems are functional, and

k) The plan of subdivision has been registered and a mylar copy has been received by the Town from the registry office

The Engineering section will issue a Functional Acceptance Certificate to the Chief Building Official indicating the conditions for Functional Acceptance have been met for the purposes of building permit issuance.

A 10.02 PRELIMINARY ACCEPTANCE

The term Preliminary Acceptance shall be used to describe the date when the services are complete and acceptable to the Town of Ajax subject to the maintenance requirements of the Subdivision Agreement.

The date for Preliminary Acceptance of the sanitary sewers and watermains installed in all new developments shall be established by the Region of Durham.

Underground Services

When the underground services are completed and cleaned to the satisfaction of the Consulting Engineer, they shall advise the Town of Ajax in writing that the work is ready for inspection. The Town shall carry out their inspection and advise the Consulting Engineer of any items of work requiring further rectification. When all deficiencies have been corrected to the satisfaction of the Town, and upon receipt of:

a) Statutory Declaration from the Owner certifying that all accounts have been paid,

b) As-built sketches for all storm sewers, foundation drain collectors, roof drain collectors, and connections along with paper prints showing all as-constructed inverts and lengths for the storm sewers, and

c) Revised storm sewers design sheets and hydraulic grade line calculations to reflect the as-constructed inverts lengths and grades for the storm sewers.

The Town will issue to the Owner a Certificate of Preliminary Acceptance for underground services.

The Certificate of Preliminary Acceptance for underground services will identify the start date for the maintenance period.

The developer will be responsible for the maintenance of the underground services until final acceptance.

Aboveground Services

When the above ground services are completed to the satisfaction of the Consulting Engineer, he shall advise the Town of Ajax in writing that the work is ready for inspection. The Town shall carry out their inspection and advise the Consulting Engineer of any items of work requiring further rectification.

Preliminary Acceptance for aboveground services cannot be given until one year has past since Preliminary Acceptance of underground services, all works on the project are completed, at least 85% of the dwellings are occupied, and all vacant blocks are topsoiled and seeded.

When all deficiencies have been corrected to the satisfaction of the Town, and upon receipt of:

a) Lot grading certificates for all developed lots,

b) Certification of all retaining walls,

c) Test results for driveways,

d) Electrical Safety Authority (ESA) final report for the streetlight system,

e) A topographic survey of all stormwater management ponds indicating that they have been cleaned out to design grades,

f) Completion certificate from the Engineering, Landscape, and Electrical Consultants,

g) Certification of acoustic control measures,

h) A statement by a registered land surveyor that they have located and/or properly re-established all standard iron bars as shown on the Plan and any reference plan prepared as a result of the subdivision,

i) Drawings in reproducible form showing the as-constructed information on all engineering drawings for the site, and

j) Statutory Declaration from the Owner certifying that all accounts have been paid

the Town will issue to the Owner a Certificate of Preliminary Acceptance of Aboveground services.

The Certificate of Preliminary Acceptance of aboveground services cannot be issued until at least one year after the issuance of the Certificate of Preliminary Acceptance of underground services, and will identify the start date for the two year aboveground maintenance period. The developer will be responsible for the maintenance of the aboveground services until final acceptance.

A 10.03 FINAL ACCEPTANCE

Final Acceptance shall be the terminology used to describe the date when the Owner's maintenance requirements have been fulfilled and the services are acceptable to the Town of Ajax.

At the end of the two year maintenance period for above ground services and when all services are completed to the satisfaction of the Consulting Engineer, the Town of Ajax shall be advised in writing that the work is ready for inspection. The Town shall carry out their inspection and advise the Consulting Engineer of any items of work requiring further rectification. When all deficiencies have been corrected to the satisfaction of the Town, and upon receipt of:

a) a statutory declaration the Owner certifying that all accounts have been paid, and

b) a letter from the Owner's Consulting Engineer and other outside agencies that services included in the Subdivision Agreement have been constructed and installed in accordance with the approved design drawings, and Town specifications, standards and requirements, the Town will issue to the Owner a Certificate of Final Acceptance.

A 10.04 FORMAL ASSUMPTION

Formal Assumption of the subdivision shall be the date on which the Town of Ajax's Council agrees by Bylaw that all the conditions of the Subdivision Agreement have been fulfilled and all maintenance requirements have been completed.

For clarification, Formal Assumption of the Subdivision refers to the transfer of maintenance responsibilities for works and services (as outlined in the Subdivision Agreement and the approved Plans) from the Owner to the Town. Assumption does not relieve or diminish the Owner from further obligations and/or responsibilities associated with the Development should problems arise which require additional action/rectification. The Owner's obligations will be terminated or reduced by the release of his funds/letters of credit by the Town, which occurs after the assumption process.

A 11.00 AS CONSTRUCTED DRAWINGS

A 11.01 GENERAL

The 'As Constructed' Drawings constitute the original engineering drawings which have been

amended to incorporate the construction changes and variances in order to provide accurate information on the works as installed in the development. The Registered 40M- Plan Number must be clearly shown on all 'As Constructed' General Plan of Services Drawings.

A 11.02 DRAWING REQUIREMENTS

'As Constructed' Revisions shall be based upon a final survey of all the subdivision services and the Consultant's construction records. The final survey of the subdivision services shall include a field check of the following items:

(a) Location and invert elevations of all sewer manholes.

(b) Distances and grades of pipes between all sewer manholes.

(c) Location of all roadway catchbasins.

(d) Location, and rim and invert elevations for all rear yard and lot catchbasins.

(e) Location of all sidewalks and curbs.

(f) Location of all valve boxes and valve chambers.

(g) Location of all hydrants.

(h) Location of all blow-offs and other special watermain appurtenances.

(i) Road centre line elevations as shown on drawings.

(j) Geodetic bench marks used for construction.

(k) Changes in sewer pipe sizes and material or class plus revised sewer design sheet.

(l) Location of all fencing constructed as part of the subdivision services.

(m) Location of all driveways, boulevard tree plantings, streetlight poles and transformers shall be shown on the Utility Coordination Plan.

(n) Location of all service connection to all lots and blocks and location of connection from nearest downstream connection.

(o) Location of all streetlight poles and transformers shall be shown on the Plan and Profiles and General Plan of Services.

The original drawings shall be revised to incorporate all changes and variances found during the field survey and to provide the ties and additional information to readily locate all underground services. As an interim measure until the original 'As Constructed' drawings have been received by the Town, one set of prints of the approved engineering drawings shall be submitted, which show the approved figures with the changed figures in coloured pencil. All sewer grades shall be recalculated to two decimal places.

All street line invert elevations of storm and sanitary service connections to each block shall be noted on the drawing.

All pencil notations on the drawings shall be removed and shall be replaced in ink.

All screening shall be removed.

All street names, lot numbers, and block identification shall be checked against the Registered Plan and corrected if required.

The 'As Constructed' Revision note shall be placed on all drawings in the revision block.

The Contract Number (Regional or Municipal only) shall be added to the drawings, if applicable.

A 11.03 TOLERANCES

A maximum vertical plotting tolerance of 0.2 m on the 1:50 vertical profile portion of the drawings and a maximum horizontal plotting tolerance of 2 m on the 1:500 scale drawing shall be considered acceptable without re-plotting.

All sewer lengths shall be shown to the nearest 0.1 m.

The information shown on the 'As Constructed' Drawings may be checked by the Town of Ajax at any time up to two years after final acceptance of the subdivision, and if discrepancies are found between the information shown on the drawings and the field conditions, the drawings will be returned to the Consultant for rechecking and revisions.

The Consultant shall be responsible to explain, in writing, any major difference between the design and the 'As Constructed' data and to provide verification that alteration does not adversely affect the design of the subdivision services.

A 11.04 SUBMISSIONS

Upon completion of all construction work and the 'As Constructed' Revisions, the original drawings shall be submitted to the Town of Ajax for their permanent records.

The submission of the 'As Constructed' Drawings on paper prints to the Town of Ajax must be completed before Preliminary Acceptance of the above ground works will be given.
The submission of the As-Constructed drawings in AutoCad R2006 (or later), PDF, and Mylar prints have to be submitted before Final Acceptance. Refer to the Regional Municipality of Durham, Design Specifications for Cad Drawing Standards.

Checklist For Subdivision Design shall be submitted with every engineering submission

A. APPROVALS AND PLANNING ISSUES

- Review approved draft plan and conditions of draft approval ..... ( )
- Tree preservation report and recommendation ..... ( )
- Fencing requirements ..... ( )
- EIS, buffer screening or planting ..... ( )
- Traffic report and recommendations ..... ( )
- SWM report ..... ( )
- Functional servicing report ..... ( )
- Noise report ..... ( )
- Phasing information
- Construction access ..... ( )
- Potential approval agencies - CA, Region of Durham, MOE, MNR, MTO, Utility companies ..... ( )

B. GENERAL

- Check submission documents in accordance with requirements in Town Standard Section A2.01 ( )
- Check all drawings meet requirements in Town Standards Sections A3.00 to A8.00 ( )
- List of drawings and key plan on cover page ( )
- Standard notes shown ( )
- Compare Draft plan with engineering drawings and M-Plan ensure compatibility ( )
- Services to lands/lots adjacent to subdivision ( )
- Easement widths to be adequate for maintenance ( )
- Walkway widths and pedestrian conductivity ( )

C. ROADS

- Review traffic report ( )
- Check pavement structures with soils report ( )
- Check geometrics (same as draft plan) ( )
- Check minimum curb radii ( )
- Check correct R.O.W. cross section, services at correct location, pavement and R.O.W. dimensions on plan ( )
- Profile - gradients, vertical curves (spot check elevations) ( )
- Road centreline station at 20 metre on the plan ( )
- Catchbasin locations/spacing ( )
- Traffic Calming Initiatives
- Depressed curb at intersections and walkway crossings ( )

D. STORM DRAINAGE SYSTEM

- Review drainage system and drainage area drawings (ensure external areas accounted for) ( )
- Review servicing report ( )
- Compare sewer calculations and drainage area drawings ( )
- Check calculation sheets (sewer and MH hydraulics) ( )
- Check manhole spacing and location - pipe location/alignment ( )
- Alignment of CB and lot connections ( )
- Sewer profile - spot check pipe size and gradient with calculation sheets, minimum pipe cover and house connections, minimum grade, velocity ( )
- Pipe strength and bedding, special bedding requirements for pipe in fill areas ( )
- Check for conflicts of pipe crossings (especially at intersections) ( )
- Check overland flow calculations and compare the flow routing with lot grading ( )
- Check 25 Yr. HGL computations and compare with the Plan Profile drawings ( )
- Manhole benching details - structural information if applicable ( )
- Check radius pipe data ( )

E. STORMWATER MANAGEMENT

- Review recommendations in Stormwater Management Report - ( )
- Compare Rational Method on sewer calculations to Stormwater Management Report to ensure compatibility ( )

- Check detention pond volume, hydraulics of inflow and outflow structures ..... ( )
- Stormwater quality issues - siltation basin and future maintenance access ..... ( )
- Use the "Reviewer's Checklist" on the MOE 2003 SWMP Manual to review the design concept of various Stormwater management control facilities and measures ..... ( )
- Operational Manual ..... ( )

F. LOT GRADING

- Overland flow route & capacity - check street cross section and swale capacity calculations, compare swale and road grades to OTTSWM report where appropriate ..... ( )
- Park and SWM pond grading drawings to include details of landscaping and planting prepared by the landscape architect..... ( )
- Overland flow easement and swale cross section shown ..... ( )
- Check all lots:
- As per standards ..... ( )
- Street line, high lot corner elevations..... ( )
- Specified house grade
- Side and rear lot line elevations..... ( )
- Retaining wall heights (fence required)..... ( )
- Check minimum basement elevations - to be minimum 0.3 m above 25 Yr. HGL..... ( )
- Ensure boundary elevations compatible with adjacent properties - overland flow routes maintained (e.g. watercourse/creeks) - ponding not created - lot swales not discharging to adjacent properties
- Compare to plan/profiles to ensure compatibility ..... ( )
- Noise barriers and vibration mitigation as per noise report ..... ( )
- Check 'Erosion & Sedimentation Plan' drawing. to ensure natural drainage is maintained and requirements as per environmental report..... ( )

G. UTILITY COORDINATING DRAWING

- Driveway locations compared to lot grading plan drawings..... ( )
- Compare with electrical plans re: light poles, transformers and aboveground site services..... ( )
- Highlight potential conflict with street tree plantings..... ( )