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## **1.0 Preface and Definitions**

Attractive and functional design is expected for all developments within the City of Greater Sudbury. This Guide is intended to compliment the various federal, provincial, and municipal acts, guidelines, manuals and by-laws that apply to developments by providing clarification and setting minimum design standards to encourage attractive and functional design; however, the City of Greater Sudbury encourages Site Plan proposals to exceed these standards.

For the purpose of this Appendix refer to the following definitions:

**Should** – Where should is used, the design detail is considered to be a best practice and the owner should make a reasonable attempt to satisfy the design detail.

**Must/Shall** – Where must or shall are used, the design detail is considered mandatory and must be satisfied.

**Lot Grading Professional** – A Lot Grading Professional may be an Engineer, Architect, Land Surveyor, Landscape Architect and/or company providing these services. The Lot Grading Professional must have a valid Certificate of Authorization to practice in their profession and valid professional liability, i.e., errors and omissions insurance. Other individuals/companies meeting the above criteria/conditions will also be eligible to be a Lot Grading Professional.

## **2.0 General Plan Drafting and Topographic Survey Details**

- The plans must be legible. All drawings shall be submitted with metric dimensions, to a standard metric scale (1:100, 1:200, 1:250, 1:300, 1:400, 1:500). Minimum scale to be 1:500.
- Existing conditions should appear faded in comparison to proposed work, and use a text size of 1.6mm or 2.0mm on the final hard copy.
- Various utility lines should be identified and appear slightly darker than existing topography.
- Proposed work should appear heavier than existing conditions, and use a text size of at least 2.0mm for notes elevations and dimensions on the final hardcopy.
- key plan, indicating location of the site in respect to the City street network;

### **The following information should be included on all of the submitted plans**

- note the date the topographic survey, used as a base for the plans, was completed and the name of the Lot Grading Professional responsible for the topographic survey information;
- identification of the proposed use of the site;
- name and address of firm preparing the plan;
- municipal address and/or Legal Description (Reference Plan, Lot, Concession and Registered Plan Lot Number);
- north arrow;
- legend;
- title block and revision block with dates for each revision;
- existing building structures and site details such as driveways, sidewalks, utilities, surface types etc. located, wherever possible and with the permission of the adjacent landowners, within 6.0m of the site;
- all existing and proposed driveways, road shoulders, traffic markings, curbs, curb cuts/depression, sidewalks, and ramps on both sides of the adjacent street;
- all man-made or natural features (ie. watercourse, swale, culvert, retaining wall, embankment, catch basin) on or adjacent to the site;
- all main proposed features of the site shall be shown (all buildings, parking areas, driveways, above ground utilities, landscape areas, fencing and handrails, ditches, retaining walls, berms, trees, etc.);
- all existing utility services within the site, and on adjacent street, road allowance, boulevards and within 6.0m of the site, including all light standards and fixture location, traffic signals, utility structures, hydro transformer boxes, vaults and Bell chambers, hydro/telephone/cable poles, guys and pedestals;
- all necessary construction details and general notes are to be provided so as to accurately convey the design intent of the elements on the plan and to address the proposed built form;
- location of all vehicle and pedestrian entrances to and from the building;
- location and description of all existing and proposed property boundaries, adjacent street names, easements, right of-way widening, and reserves within or adjacent to the subject lands;
- sight triangles; and,
- signs (municipal and private) and parking meters.
- required professional seals.

### **3.0 Site Plan**

All information on the Site Plan must be in conformance with the City of Greater Sudbury Zoning By-law, Ontario Building Code, and any other applicable bylaws and design standards. All information within the Municipal Right-of-Way must be in conformance with the CGS Engineering Design Manual. In addition the following design details and drawing information should also be presented.

#### **3.1 Additional Planning Design Details**

- 1) Relate the size, character and setting of proposed projects to the functions of adjacent streets and pedestrian networks. Buildings should generally be oriented to the public rights-of-way and close to pedestrian movement.
- 2) Developments should be designed for the ease of pedestrians both on and Off-Site and encourage the separation of pedestrians and automobiles. Developments should be convenient to and accessible by persons with physical limitations and disabilities.
- 3) Incorporate architectural and landscape elements at the pedestrian level.
- 4) Consider the function and location of service and loading areas early in design development.

#### **3.2 Additional Vehicle Movement, and Parking Layout Design Details**

- 1) Vehicles are required to enter and exit the site in a forward motion. Vehicle turning path templates may be required to ensure adequate turning radius and hammer heads are provided.
- 2) Handi-Transit Vehicles, where required by Transit Services, shall be accommodated onsite from the driveway entrance to the main building entrance without affecting the flow of two way traffic, and so that the vehicle can navigate the site in a forward motion at all times . Handi-transit vehicles shall be modeled as a Medium Single Unit (MSU) vehicles as per the TAC standards, using the following dimensions: 2.4m wide, 8.1m long, 4.85m wheel base, 0.91m overhang (Inside radius 6.0m and outside radius 9.0m.)
- 3) Hard surface (i.e. asphalt, unit pavers, concrete, etc) must be provided as follows:
  - a. Residential and Commercial zoned properties must provide hard surface for all proposed drive aisles, parking, loading spaces, and outdoor storage areas.
  - b. Institutional and Industrial zoned properties must provide hard surface for all required drive aisles, and parking spaces; except where the property is adjacent to a residential zoned property in which case loading spaces, and outdoor storage areas must be hard surface pavement as well.
  - c. Required for all accessible parking spaces and barrier free paths of travel.
- 4) A barrier curb or car park barrier system is required along all parking stalls that abut landscaped areas and buildings to prevent vehicles from overshooting the parking space limit and parking on the landscaped areas or damaging buildings. Precast bumper curbs are not acceptable for new development or where alternative measures cannot be implemented. (Note, bumper curbs shift during snow removal activities)
- 5) Snow storage areas must be identified and must not interfere with the required parking, drive aisles or loading areas. Snow storage areas must drain to stormwater quality treatment facilities but should not be located so as to negatively affect the treatment efficiency of the facility. Where sufficient room is not available on site for snow storage, accommodations must be made for snow removal to a certified off-site snow storage area.
- 6) Drive aisles should not to be longer than 35m.

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- 7) Refer to Section 10 below for additional design details for work within the Municipal Right-of-Way.

3.3 Additional Driveway Entrance Design Details

- 1) Generally, developments will be limited to one driveway entrance. Shared driveway entrances with adjacent property owners should be utilized on Arterial and Collector Roads, wherever possible. A shared access agreement will be required in these circumstances.
- 2) Driveway entrance widths must not be wider than 9.1m. Where a driveway entrance wider than 9.1m is required for larger vehicles, vehicle turning path templates, and lane configurations must be shown on the drawings.
- 3) Where the Road adjacent to the property is constructed with curb and gutter and/or sidewalks, or where there is an asphalt shoulder, the access driveway located within the road right of way must have concrete curbs. Where there is an asphalt shoulder the curbs must extend to the shoulder and must include spillways, and tapers as per OPSD 604.01.
- 4) Zebra stripe markings to be provided at all driveway entrances where municipal sidewalks exist or are being proposed. Zebra stripes should be made with durable paint (to reduce fading and upkeep), 3.0m long, 0.6m thick and offset 1.2m.
- 5) Where municipal sidewalks do not cross the driveway entrance a 45cm thick stop bars must be installed along the width of the outbound lane, located 1.0m from the back of the curb depression.
- 6) Where gravel parking and drive aisles are permitted, at minimum the first 15m of the driveway entrance must be paved.
- 7) Entrances located in close proximity to signalized intersections should be located as far as possible (greater than 30m) from the intersection.

3.4 Additional Active Transportation Design Details

- 1) A safe and well defined pedestrian walkway in accordance with AODA requirements, constructed with an approved hard surface, must be provided to all main building entrances with connections to municipal sidewalks, accessible parking spaces, and transit areas;
- 2) The pedestrian walkway should have a minimum width of 1.5m clear from vehicle overhang and shall be defined across driveways through line painting (zebra stripes) as a minimum.
- 3) Where municipal sidewalks do not exist along the frontage of the property, and where it is identified in the CGS Official Plan that sidewalks are required, the owner shall either contribute to the cost of the future installation of the sidewalk or install the sidewalk along the frontage of the site as determined by CGS staff.

The contribution cost will be based on the City's contract unit prices for sidewalk work, and will be revised each year in June, as necessary. For estimate purposes, 2016 unit prices for sidewalk are as follows:

- Sidewalk (as per City Standard) = \$300.00/l.m
- Boulevard Restoration (topsoil and sod) = \$ 38.00/sq.m
- Boulevard Restoration (asphalt and granular) = \$ 58.00/sq.m

- 4) Bike racks should be located as close to the main entrance as possible, and must be securely fastened to the ground or building to prevent the rack from being removed. Bicycle racks must not be secured to interlocking pavers, stones or other surfaces that may easily be removed.
- 5) Bike racks must provide support to both maintain a bicycle in an upright position and lock the bicycle frame and wheel to the bicycle rack with a single U-lock.

### 3.5 Site Plan Drafting Details

In addition to the General Plan Drafting Details noted in Section 2.0 the following information should be included on all Site Plans, prepared and sealed by a Lot Grading Professional:

- use of existing and proposed buildings and number of storeys, including building blocks to be numbered and number of units (if there is more than one use in a building or on a lot, provide the floor area allocated to each use);
- overall dimensions (in metric) of all property boundaries and all buildings and structures (including retaining walls) existing or proposed on the site and abutting properties (where possible), including dimensions and setbacks sufficient to show the position of buildings and structures in relation to site boundaries;
- zoning of adjacent properties;
- location, design and construction details of garbage collection area, including required screening and method of collection;
- location of all outdoor storage and enclosure details;
- a site statistic table indicating the following for each use, as applicable:
  - lot area;
  - paved area;
  - landscaped area % and calculations;
  - building area;
  - gross floor area;
  - net floor area;
  - number of units;
  - use of each unit;
  - height of building;
  - number of storeys;
  - number of required and provided bicycle parking spaces;
  - number of required and provided parking spaces;
  - number of required and provided barrier free parking spaces;
  - number of required and provided loading spaces;
  - lot coverage %;
  - lot coverage accessory buildings (residential lots only);
  - percentage of paved and/or graveled area.
- for residential development, the site statistic table shall also indicate the following:
  - density (units/ha);
- Layout of parking area and dimensions of parking spaces, barrier-free parking spaces, loading spaces, aisles, driveways, ramps, fire routes;
- identify type of parking area (i.e. open, underground, garage);
- layout and details of all curbs and vehicle stops.
- truck routes, turning radii and required fire access routes;
- location and dimension of all vehicle entrances, including width, turning radii and sight triangles;
- queuing requirements for drive-through, service stations, etc
- label existing and proposed surface treatment (i.e. grass, paved, gravel).

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- abutting road right-of-way width including the location and width of traffic islands, hydro poles, fire hydrants, sidewalks, etc.;
- location of all existing and proposed traffic signs;
- location and dimension of snow storage area or plans for snow removal off-site where space is constricted;
- identify material type and width of Municipal and private sidewalks and walkways;
- location and type of bicycle racks and method of securing to the ground;

#### **4.0 Landscape Plan**

Landscape information may be included on the Site Plan or Grading Plan for smaller sites. All information on the Landscape Plan must be in conformance with the City of Greater Sudbury Zoning By-law. In addition the following design details and drawing information should also be presented.

##### **4.1 Additional Landscaping Design Details**

- 1) Landscaping is a critical component of any development. Generally, the landscape design of any development or redevelopment should :
  - Contribute to the overall city image;
  - Enhance the public perception of the proposed development;
  - Preserve existing trees and natural features, where possible;
  - Provide a diversity of plant material and naturalizing, where possible;
  - Be integrated with stormwater management features;
  - Be easy to maintain without catchment areas that attract debris;
  - Provide open space for the enjoyment of outdoor activities of the residents of the property;
  - Screen less attractive elements of the development such as the parking areas, loading areas, storage areas, garbage enclosures, etc.
- 2) Any part of any lot which is not occupied by buildings, structures, parking areas, driveways, loading spaces, agricultural uses, outdoor storage areas or any other permitted use, shall be maintained as landscaped open space.
- 3) All plant material is to be Canadian Nursery Trades Association standards as per guide specification for nursery stock. When possible all plant material is to be native Ontario materials. All plant substitutions are to be approved prior to planting.
- 4) Whenever possible, species native to the Greater Sudbury Area should be used. The use of native species helps to reduce the spread of invasive species and helps ensure the overall success of the planting.
- 5) Deciduous trees are to be a minimum 70mm calliper (2.75") measured at 150mm (4.9') above ground;
- 6) Coniferous trees are to be a minimum height of 1.6m (5.25');
- 7) Tree species must meet the City's tree planting bylaw. The following trees are recommended for planting in areas that have high exposure to soil salt and aerosol salt:
  - Chokecherry
  - Japanese Tree Lilac
  - tree form Pea shrubs
  - Ohio Buckeye
  - Blue Spruce
  - Honey Locust
- 8) Trees within the landscape strip adjacent to the Right of Way, at a minimum, must be planted 6m on centre and offset sufficiently from any services with appropriate root shields installed. Alternative landscape proposals will be considered to allow for more open space or where bedrock is high; however, it is anticipated that an equivalent number of trees will be provided as set out above.



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- 9) Adequate soil drainage and volume should be provided for all trees and landscaping to promote vigorous root growth, and to negate the effects of any road salt use. Tree pits or raised planter should be considered where sufficient room is not available.
- 10) Landscaping within the sight triangle must be in accordance with the Zoning By-law.

### 4.2 Landscaping Plan Drafting Details

In addition to the General Plan Details noted in Section 2.0 the following information should be included on all Landscape Plans:

- location and identification (in landscape industry standard symbols and notations) of all existing or proposed plant material, planting beds, sodded areas, berms and other soft surfaces;
- location, height and description of all existing and proposed retaining walls, fences, walls, vegetative screening, including cross section;
- plant list indicating full botanical name, common name, quality, caliper, height, spread, and any special plant material;
- trees along right-of-way;
- clearly indicate the location of all vegetation to be retained or removed;
- identify all recreational areas (i.e. tennis courts, swimming pools, splash pads, sports fields, play equipment).

## **5.0 Lighting Plan**

Lighting information may be included on the Site Plan or Servicing Plan for smaller sites. The following design details and drawing information should also be presented, where the development is adjacent to existing residential properties, or other light sensitive uses.

### **5.1 Additional Lighting Design Details**

- 1) Reduce light trespass on adjacent properties and municipal or regional road by incorporating the use of full cut-off fixtures, low wattage bulbs and flat glass fixtures to reduce glare and by directing it away from adjacent natural, residential and other sensitive areas
- 2) Maximum of 1 foot-candle at the property line must be maintained.
- 3) Lighting should be designed to promote pedestrian and vehicle safety while minimizing ambient light pollution.
- 4) Lighting should be designed for dark sky protection.

### **5.2 Lighting Plan Drafting Details**

In addition to the General Plan Details noted in Section 2.0 the following information should be included on all Lighting Plans, prepared and sealed by a Professional Engineer Licensed in the Province of Ontario with a valid Certificate of Authorization:

- location and design of all exterior lighting, including lighting fixture details;
- a separate lighting photometric plan for infill projects and major developments may be required, as determined by the City.

## **6.0 Building Elevation Plan (Architectural Plan)**

Elevation Plans are generally required for all Site Plans with a C6 Zoning, or where the site abuts an Arterial Road or Provincial Highway.

### **6.1 Additional Building Elevation Design Details**

- 1) Buildings, structures and other design elements that complement existing built form and character are encouraged.

The following information should be included on all Elevation Plans, prepared and sealed by an Architect:

### **6.2 Elevation Plan Drafting Details**

- exterior material type and colour;
- all roof structures, screening and mechanical equipment (penthouses, chimneys, roof top units, vents, air conditioning, etc.);
- location and dimensions of any existing or proposed roof or fascia signs.

## **7.0 Grading Plan**

Grading information may be included on the Site Plan or Servicing Plan for smaller sites. Where grading information is indicated on other plans the grades indicated on the grading plan will take precedence, all other grading information should be removed or coordinated with the grading plan. All information on the Grading Plan must be in conformance with the City of Greater Sudbury Lot Grading Policy, Ontario Building Code, and any other applicable by-laws and design standards. In addition the following design details and drawing information should also be presented.

### **7.1 Additional Grading Design Details**

- 1) All Retaining walls greater than 1.0m in height must comply with the Ontario Building Code, the Zoning By-law, and will require a Building Permit.
- 2) All slopes greater than 2:1 and greater than 1.0m in height shall include a pedestrian guard, designed in accordance with the requirements of the Ontario Building Code, fastened securely along the top of the slope. Where pedestrian access to the high part of the slope is not easily accessible, a 1.8m (6ft) high chain link fence may be used in place of a pedestrian guard.
- 3) All slopes greater than 2:1 and greater than 0.6m in height located adjacent to vehicular traffic shall include a vehicle guard, designed in accordance with the requirements of the Ontario Building Code, fastened securely along the top of the slope.
- 4) Barrier free path of travel must be provided for all accessible parking stalls and along all exterior walkways in accordance with the Ontario Building Code.
- 5) Where ramps are not installed in accordance with the OBC, a maximum grade of 5% should be used for all areas of the site designed for pedestrian access, with a maximum 2% cross fall.
- 6) Maximum gradients for vehicles should be 6%, with a maximum 6% cross fall.
- 7) Slopes less than 1% should generally be avoided on all vehicle and pedestrian areas. A 2% slope is preferred.
- 8) Grading within the site along the Municipal right of way should accommodate an urban cross section within the right of way. (i.e, a 2-4% cross fall from the property line to the curb or future curb)
- 9) Any existing Municipal ditch along the property line shall be regraded to meet City standards and shall be realigned to be located entirely within the right of way, where possible.
- 10) All rock cuts within the site should be constructed using the principles of the Ministry of Transportation publication "RHRON: Ontario Rockfall Hazard Rating System - Field Procedures Manual" with 100% retention used as the design requirement.
- 11) Where rock blasting must occur a rock blasting report must be provided to building services for review.
- 12) Gabion baskets and rock rubble slopes are not permitted.
- 13) Refer to Section 10 below for additional design details for work within the Municipal Right of Way.

### **7.2 Grading Plan Drafting Details**

In addition to the General Plan Details noted in Section 2.0 the following information should be included on the Grading Plan prepared and sealed by a Lot Grading Professional:

- All Plans containing proposed grading information must be sealed by a Lot Grading Professional;

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- Sufficient proposed and existing elevations at property line, back edge of sidewalk, top and bottom of curbs and retaining walls, road crown, site entrances and along the frontage of the property as required to show the design intent, ensure all drainage is retained within the site, and to reflect how the proposed grades match into the existing condition;
- arrows indicating the direction and slope of surface drainage on all paved, granular and grassed areas;
- proposed elevations at all locations where the grade changes on the site, including cross sections of any changes of elevation required to convey the design intent;
- proposed elevations at all building corners and all building access points, (i.e. ramps, entrances, and loading bays);
- drainage swales with cross section details, including subdrains where the slope is between 0.3% and 1.0%;
- roof downspout locations and direction of drainage;
- rim elevations on all catchbasins and maintenance hole;
- wherever possible and with the permission of the adjacent landowners, existing elevations are required to be shown at 3.0m and 6.0m beyond the site limits;
- indicate locations where rock removal is required;
- erosion protection measures;
- geodetic grades as well as finished ground floor and lowest opening elevations, including basement floor elevations for all buildings requiring servicing.

## **8.0 Servicing Plan**

Servicing information may be included on the Site Plan or Grading Plan for smaller sites. All servicing information within the Municipal Right of Way must be in conformance with the City of Greater Sudbury Engineer Design Manual, Standard Drawings and Specifications, and all servicing information within the site must be in conformance with all applicable provincial regulations and guides, Ontario Building Code, the City's Sewer Use By-law, and the City's Water and Wastewater Systems By-law. In addition the following design details and drawing information should also be presented.

### **8.1 Additional Water Service Design Details**

- 1) Only one water service connection to the municipal system is allowed per site;
- 2) Water services or sewers serving multiple buildings located on the same property, and water services 100mm or greater, must be designed and installed according to MOECC guidelines
- 3) Generally, a live tap shall be made where service connections are two pipe sizes smaller than the main up to a maximum service connection size of 200mm;
- 4) A single water meter is required for all developments (residential, commercial, industrial). The water meter must be located on the water service prior to splitting the flow to multiple buildings. The meter must be installed in a building designed for continuous human occupancy and accessible by the City. Meters for services >50mm must be supplied by the owner, and must be Neptune or approved equivalent;
- 5) Ensure the length and size of the water service, relative to the demand, provides sufficient turnover time to maintain adequate residual chlorine levels;
- 6) Hydrant leads on site should not exceed 30m after the last domestic service connection.
- 7) The available fire flow, and pressure for domestic max day and hour at the property line, from the existing municipal watermains adjacent to the site, will be modeled by the City and the results provided to the owner. The owner or their authorized representative must confirm sufficient capacity is available for the water services within the site;
- 8) All service connections and disconnections must be in accordance with City's Protocol for New Watermain, Water Service and Wastewater Connections;
- 9) Field beds must be setback a minimum of 30m from the high water level associated with any adjacent watercourses.
- 10) Refer to Section 10 below for additional design details for work within the Municipal Right-of-Way.

### **8.2 Additional Sanitary Service Design Details**

- 1) Only one sanitary service connection to the municipal system is allowed per site;
- 2) Sanitary services 150mm or greater shall be designed as a main, and must meet MOE guideline design requirements;
- 3) Sanitary test maintenance holes must be located entirely on the site, and are required for all non-residential sites;
- 4) Service connections 200mm or greater must be made with a maintenance hole located on the Main.
- 5) Provide a letter, sealed by an engineer, indicating the existing and proposed sanitary peak flow calculations in accordance with the City of Greater Sudbury Engineering Design Manual. The letter must also confirm there is capacity in the service connection to the site.
- 6) Refer to Section 10 below for additional design details for work within the Municipal Right of Way.

### 8.3 Additional Storm Service Design Details

- 1) Storm service connections should be limited to one per site;
- 2) All proposed catchbasins must contain a goss trap as per the City's Sewer Use By-law, unless a downstream quality control facility is in place. If catchbasin maintenance holes are being proposed the goss trap design must address upstream flows and associated water levels.
- 3) Provide a letter, sealed by an engineer, indicating the existing and proposed stormwater peak flow calculations for the required storm event as outlined in the City of Greater Sudbury Engineering Design Manual. The letter must also confirm there is capacity in the service connection to the site.
- 4) Refer to Section 10 below for additional design details for work within the Municipal Right of Way.

### 8.4 Servicing Drafting Guidelines

In addition to the General Plan Details noted in Section 2.0 the following information should be included on the Servicing Plan, prepared and sealed by a Professional Engineer Licensed in the Province of Ontario with a valid Certificate of Authorization:

- all Plans containing proposed servicing information must be sealed by a Professional Engineer.
- watermain services to the building with pipe material, diameters and obvert elevations at critical locations;
- details of any service connections to the City infrastructure;
- hydrant flange elevations and adjacent finished ground elevations shall be shown on all hydrants within or immediately adjacent to the site;
- well locations (if required);
- specify all existing services or stubs to be abandoned at the main;
- Location of all hydrants including dimensions to the proposed building;
- sanitary sewers, storm sewers labeled with the following: pipe material, diameter, slope, pipe bedding, and pipe inverts at all manholes, catchbasins, points of connection to main, building face and at property line;
- identify and dimension catch basins, double catchbasins, ditches, culverts, ditch inlets and ditch outlets, manholes, hydrants, valves (boxes and chambers), Siamese connections and service shutoffs (municipal curb stops to be located within the right of way, 0.3m from the property line);
- rim elevations of all manholes and catchbasins;
- location and details of all proposed stormwater management controls/facilities indicated in the stormwater Management Report (if required);
- finished ground floor and basement floor elevations;
- septic system location (if required);
- specify all existing services or stubs to be abandoned at the main;
- drainage swales;

## **9.0 Construction Siltation Control Plan**

Construction Siltation Control information may be included on the Site Plan, or Grading Plan, for smaller sites. All Siltation control must be in conformance with all applicable provincial regulations and best management practices. In addition the following design details and drawing information should also be presented.

### **9.1 Additional Construction Siltation Design Details**

- 1) Include the following Notes as a minimum:
  1. Sediment barriers, check dams, and temporary construction access to be installed prior to the beginning of construction.
  2. All sediment control devices to be routinely inspected and maintained in proper working order until areas are stabilized.
  3. If necessary, trucks will be washed down before leaving the site.
  4. The site will be wet down if necessary to control dust.
  5. All construction activity will comply with City of Greater Sudbury Noise Bylaw.
  6. All construction vehicles to enter and exit site from temporary construction access.
  7. All topsoil stockpiles to be surrounded with sediment control fencing.
  8. Filter fabric to be placed under grates on all catchbasins to trap sediment. Silt traps are to be cleaned regularly and are not to be removed until all construction activity is complete. Filter fabric for silt control to be Terra Fix 270R or approved equivalent.
  9. Where construction activity takes place within the City right of way, sediment controls will be placed on the catchbasins on public streets across the property's frontage.
  10. Street sweeping, catchbasin cleaning and dust control are the responsibility of the developer and must be kept under control on all roadways to the satisfaction of the General Manager of Growth and Infrastructure.
  11. Surface erosion protection should be applied for all disturbed areas, subject to erosion, until vegetation is established.
  12. A log book shall be kept onsite indicating inspection schedules, repairs made, & any concerns noted.

### **9.2 Construction Siltation Drafting Guidelines**

In addition to the General Plan Details noted in Section 2.0 the following information must be included on the Construction Siltation Control Plan prepared and sealed by a Lot Grading Professional:

- all plans containing proposed sediment and erosion control information must be sealed by a Lot Grading Professional;
- location and details of all temporary surface erosion protection required until vegetation is established;
- location and details of all sediment barriers, check dams, ponds, etc required to prevent erosion and prevent the transfer of sediment off-site via construction vehicles;
- location and details of all temporary construction access and measures to be taken to prevent the transfer of sediment off-site;



## **10.0 Details, Cross Sections, and General Notes**

Details, Cross Sections, and General Notes may be included on other drawings or on a separate Plan.

- Cross Sections should be provided at minimum when:
  - requested by City staff to provide further clarification;
  - service locations are in close proximity to building foundations;
  - major changes in grade occur on the site;
  - complex storm water management systems are proposed.
  - Service connections are proposed within the right of way, to show sufficient clearance with existing services and utilities.
  
- The followings general notes must be provided as a minimum:
  - The Engineer's certification submission for all work completed in the municipal right of way and all pipe work constructed on private property shall be in conformance with the City's Certification Requirements.
  - Prior to commencing any work within the municipal right of way, the contractor or developer will obtain all necessary road occupancy permits, and service connection permits from the City's Engineering Services.
  - All work within the City right-of-way shall be constructed in accordance with City of Greater Sudbury design standards and specification, or the Ontario Provincial Standards may, subject to the approval of the City of Greater Sudbury, be used where no standard or specification is noted.
  - All disturbed areas within the municipal right-of-way shall be rectified to the original condition or better and to the satisfaction of the General Manager of Growth and Infrastructure.

## **11.0 Off-Site Servicing Plan**

An Off-Site Servicing Plan is required where an Environmental Compliance Approval (ECA) from the Ministry of Environment and Climate Change (MOECC) is required (i.e. extension of any municipal sanitary, storm or watermains, not including service connections) or improvements are required within the Municipal Right of Way that effect municipal infrastructure outside the boulevard directly adjacent to the development property (not including service connections).

Off-Site Servicing information must be presented on separate plan and profile drawings, intersection drawings, and/or pavement marking drawings in accordance with the CGS Engineering Drawing Standards. All information presented on the off-site servicing plan and profile plans must be in accordance with all applicable Provincial and Municipal standards and guidelines (Including the CGS Supplemental Specifications, Engineering Design Manual, Ontario Traffic Manual, etc.). In addition the following design details and drawing information should also be presented.

### **11.1 Additional Off-Site Servicing Plan Design Details (including all Plans where work is proposed within the Municipal Right-of-Way)**

- 1) All asphalt cuts within the Municipal right of way must be located outside the travelled portion of the roadway, along lane traffic markings. Asphalt cuts must be skewed at 2:1 perpendicular to the direction of vehicular traffic.
- 2) Asphalt cuts for proposed curb work must be located minimum 0.6m from the edge of asphalt.
- 3) Edge treatment must be installed along all asphalt joints
  - o For all arterial/collector roads Denso-band size 15mmx45mm or approved equivalent shall be used.
  - o For all local roads Denso-reinstatement tape size 2mmx 50mm or approved equivalent shall be used.
- 4) Specify Cathodic protection to be Denso tape, or approved equivalent, wrapped around all metal pipes and appurtenances, water services and fittings, excluding copper services, as per the manufactures specifications;
- 5) Appropriate cover for all services and mains should be provided in conformance with the CGS Engineering Design Manual. Where this cover cannot be obtained, and upon approval of the General Manger of Growth and Infrastructure, the pipe must be pre-insulated with Urecon or approved equivalent.
- 6) All service connections must be made perpendicular to the main, unless otherwise approved by the General Manager of Growth and Infrastructure.
- 7) All Culverts larger then 900mm diameter must be Poly-Coated CSP or Concrete, where culverts greater than 1.8m diameter must be concrete box culverts.
- 8) All rock cuts adjacent to or within the municipal right-of-way, shall be constructed using the principles of the Ministry of Transportation publication "RHRON: Ontario Rockfall Hazard Rating System - Field Procedures Manual" with 100% retention used as the design requirement.
- 9) Where rock blasting must occur a rock blasting report must be provided to building services for review.

## 12.0 **Stormwater Management Report**

Stormwater Management Controls must be in conformance with the Current Ministry of the Environment and Climate Change Guidelines as well as the City of Greater Sudbury's Engineering Design Manual, watershed studies, and Conservation Sudbury (Nickel District Conservation Authority) requirements. In addition the following design details and report information should also be presented.

### 12.1 Additional Quality Control Design Details

- 1) Onsite Quality Control is required for the entire site, including pre development impervious areas. The quality control facilities must be sized to capture and treat a minimum 90% volume of the annual runoff on a long-term average basis without bypass
- 2) A minimum TSS and floatables removal rate of 80% (enhanced) is required to be achieved for the site; unless stated otherwise in the Watershed Study.
- 3) Where Oil Grit Separators are proposed only Stormceptor (STC) or Vortechinics are approved by the City. Acceptance of other equivalent OGS units will be reviewed on case by case bases. Vortechinics units must be modeled using a 50 micron average particle size and Stormceptor (STC) must be modeled using a fine particle size distribution as follows:

Particle (um)	(%)	Specific Gravity
20	20	1.3
60	20	1.8
150	20	2.2
400	20	2.65
2000	20	2.65

- 4) Low Impact Development (LID) practices must be designed in accordance with MOECC Guidelines and the TRCA LID Guidelines as an interim guideline.  
[http://sustainabletechnologies.ca/wp/wp-content/uploads/2013/01/LID-SWM-Guide-v1.0\\_2010\\_1\\_no-appendices.pdf](http://sustainabletechnologies.ca/wp/wp-content/uploads/2013/01/LID-SWM-Guide-v1.0_2010_1_no-appendices.pdf)

### 12.2 Interim Stormwater Management Plan (SWM) Details

- 1) An Interim SWM Plan may be entered into for sites that meet all of the following criteria subject to approval by the General Manager of Growth and Infrastructure:
  - a) no expansion of the existing impervious surfaces proposed,
  - b) minimal regrading required,
  - c) life expectancy of the pavement surface exceeds 5 years,
  - d) proposed site use does not impose a significant risk to stormwater quality, and
  - e) interim SWM measures can be implemented on site.
- 2) Where an Interim SWM Plan is being entered into, a Stormwater Management Report is required as part of the Site Plan Control Application and shall include the following:
  - a) All report requirements noted in section 12.4 below;
  - b) an Interim SWM Plan, provided on a separate letter head and sealed by a Professional Engineer;

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- c) a Schedule for implementation of the Interim SWM Plan;
  - d) and a Stormwater Maintenance protocol for the maintenance of the future stormwater measures to be implemented, provided on a separate letter head and sealed by a Professional Engineer.
- 3) The Interim SWM Plan will be included in the Site Plan Agreement and will be registered on title. As a minimum the Interim SWM Plan will state the following:

*Until such time as the permanent stormwater management facilities are installed on the property, in accordance with the approved plans and Stormwater Management Report, the property will be maintained as follows:*

- a) *Goss traps to be installed on all Catchbasins.*
  - b) *After each rain event inspect all Catchbasins, and remove all floatables or Oil that may collect in the sump.*
  - c) *Weekly inspection of the property and removal of all garbage, excessive sediment or debris, and oil/gas spills.*
  - d) *In the event of an oil or gas spill, apply appropriate absorbent (sand or sawdust) to remove the spill immediately, and report all spills to all applicable regulatory bodies and to the City.*
  - e) *Semi Annual inspection of all Catchbasin sumps, and removal of all debris in excess of 300mm.*
  - f) *Annual early spring sweeping of parking lot and walkway to remove all winter sand, loose asphalt, and other sediment. Where loose asphalt is observed asphalt must be repaired.*
  - g) *Annual late fall Inspection of all flat roofs and eaves troughs, and removal of all leaves and sediment.*
  - h) *Maintain all grassed areas in good condition by watering and mowing as needed, and limit the use of fertilizer in accordance with the current City Lawn Fertilizer By-law.*
- 4) Upon approval of the Interim SWM Plan and registration of the agreement an annual Interim SWM Maintenance letter, signed by the property owner, must be provided to the City's Planning Services and a copy of the letter must be retained on the property. This letter must provide an update on the schedule to implement the stormwater management facility and must indicate the Interim SWM measures taken. Compliance with the interim Stormwater Management Plan will be reviewed and monitored by the City's By-law Enforcement Services.
- 5) Planning Services must be informed prior to implementation of the final stormwater management facilities. A site plan amendment may be required if the design of the Stormwater Management Facility changes significantly during implementation.

### 12.3 Additional Quantity Control Design Details

- 1) On-site quantity control is required to be provided on-site, unless determined otherwise by the City's Drainage Engineer based on watershed studies or local knowledge in the absence of watershed studies.

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- 2) As a minimum Post to Pre-development controls must be provided for the 5 and 100 year storm events.
- 3) A 20% reduction in the pre-development flow rate is required for developments located in a Source Water Protection area with a vulnerable zone score >7.
- 4) For developments within areas controlled by Conservation Sudbury, and for flood assessment and design of major overland flow conveyance systems the design peak flow shall be the largest of those generated by the 100-year design storm or the Regional Storm (Timmins Storm).
- 5) Maximum ponding depth for parking lot storage should not exceed 300mm.
- 6) Where a cash contribution is required in lieu of onsite Quantity Controls the following contribution equation will be used based on the increase in impervious areas. These amounts are from 2016 and are subject to change, as necessary, to account for inflation:
  - Residential = \$1,000 up to the first 560sq.m and \$1.79/sq.m after that.
  - ICI = \$2,000 up to the first 560sq.m and \$3.57/sq.m after that.

### 12.4 Report Details

The following information must be included in the Stormwater Management Report prepared and sealed by a Professional Engineer Licensed in the Province of Ontario with a valid Certificate of Authorization:

- location map of the subject property;
- property description;
- post and pre development, internal and external drainage area plans indicating all flood and fill lines, overland flow routes, all upstream lands and diversion of any drainage routes, and modeling parameters used (i.e. run-off coefficients, areas, CN values, % imperviousness, etc);
- schematic layout of existing and proposed storm sewer networks, including manhole and catchbasin descriptions coordinated with the Site Servicing Plan;
- schematic layout of the sub watershed showing the main watercourse, tributaries and trunk sewers;
- provide descriptions of pre-development and post-development conditions and respective storm release rates;
- plans detailing storage facility locations and volumes, control structures, invert elevations, water levels, and outlet locations;
- any supporting calculations, reports and drawings, such as:
  - calculation of surface run-off;
  - ponding/water elevations corresponding to the required level of controls;
  - calculation of run-off coefficients, % imperviousness, and times of concentration;
  - calculation of permissible release rate and required on site storage;
  - methods of run-off attenuation and on site storage;
  - measures to maintain or improve water quality;
  - measures to minimize impact of run-off downstream, including erosion, flooding etc;

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- proposed roof control device locations, type, control release rates and corresponding storage volumes for flat roof portions;
- in-situ percolation rates;
- Maintenance Protocol for the proposed stormwater management (SWM) facility, provided on a separate letter head and sealed by a Professional Engineer; The Maintenance Protocol must outline the following as a minimum:
  - Indicate the periods that maintenance is required for the site and for each SWM facility, and outline the maintenance procedure.
  - Indicate the lifespan of the SWM facility and the periods at which review and monitoring of the system are required to ensure that the required level of treatment is being maintained.
  - Indicate the qualifications required to provide the maintenance/review/monitoring of the SWM facility.
- spill prevention and contingency plan, covering information requirements as per O.Reg 224/07 where applicable, provided on a separate letter head and sealed by a Professional Engineer;
- geotechnical reports and hydro-geological studies where applicable.

### **13.0 Additional Reports**

#### **13.1 Traffic Impact Study**

The City of Greater Sudbury may require the completion of a Traffic Impact Study for any development regardless of size and land use. All proposed developments are considered on an individual basis in order to assess the need for a Traffic Impact Study. The Traffic Impact Study must provide an assessment of the adequacy of the existing or future transportation system to accommodate additional traffic generated by the proposed development or redevelopment. It shall recommend what, if any, improvements will be required to the roadway system in order to maintain a satisfactory level of service. The Traffic Impact Study must be prepared, signed and stamped by a qualified Professional Engineer.

Existing traffic information or clarification regarding the report requirements can be obtained directly through the Roads and Transportation department.

This Study must be provided through the Site Plan review process when requested.

#### **13.2 Geotechnical Assessment**

The purpose of a Geotechnical Assessment is to evaluate the soils and subsurface conditions of a site and to provide recommendations for the design and construction of the site pavement, services, building, etc. The Geotechnical Assessment must be prepared, signed and stamped by a qualified Professional Engineer.

This Study must be provided to Building Services, and must form the basis of the pavement and servicing design.

#### **13.3 Rock Blasting Report**

The purpose of the rock blasting report is to ensure that all rock blasting, removal, and any proposed rock faces are constructed in a safe manner that does not negatively impact the surrounding properties, and provides for the long term.

The rock blasting report can be included in the geotechnical report, but it must be prepared by a Professional Engineer, with a minimum of five (5) years experience related to blasting. The report must include the following as a minimum:

- a) How the work related to blasting shall be undertaken safely to protect adjoining structures and other infrastructure.
- b) Recommendation and specifications as a minimum but not be limited to the following;
  - Pre-blast survey of surface structures and infrastructure within affected area
  - Trial blast activities
  - Procedures during blasting
  - Procedures for blasting near Critical infrastructure with special vibration considerations, including but not limited to rock tunnels, concrete pressure pipe, etc."
  - Procedures for addressing blasting damage complaints
  - Blast notification mechanism to adjoining residences
  - Structural stability and certification of exposed rock faces

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The blasting consultant retained by the Owner shall be independent of the contractor and any subcontractors doing blasting work. The blasting consultant shall be required to complete specified monitoring recommended in the report of vibrations levels and provide a report detailing those recorded vibration levels. Copies of the recorded ground vibration documents shall be provided to the contractor and contract administration weekly or upon request for this specific project.

The above noted report shall be submitted for review to the satisfaction of the Chief Building Official prior to the commencement of any removal of rock by blasting. Should the Owner's schedule require to commence blasting and rock removal prior to the site plan agreement having been signed, a site alteration permit shall be required.

After construction is complete the blasting consultant will be required to provide a PEO sealed Certification letter for all rock faces, created during the blasting, prior to building occupancy.

### 13.4 Hydrogeology Study

A Hydrogeology Study is required for all applications in areas serviced by private water and septic services. The Hydrogeology Study must be prepared, signed and stamped by a qualified Professional Engineer.

This Study must be provided to the Sudbury & District Health Unit.

### 13.5 Environmental Impact Study

An Environmental Impact Study is required for applications that affect significant or environmentally sensitive lands and/or waters. In addition to any external review agency requirements, the report shall include as a minimum a description of the environment that will be affected, description of the development proposal, an assessment of the expected impacts on the environment, a list of assumptions used in the assessment and recommendations regarding the actions necessary to prevent, mitigate or remedy the effects on the environment of the development proposal. The Environmental Impact Study must be prepared by a qualified Professional with relevant environmental expertise.

This Study must be provided through the Site Plan review process when requested.

### 13.6 Noise and Vibration Study

A Noise and/or Vibration Study is required where a sensitive land use (i.e., Residential, Hotel, Hospital, etc.) is proposed near a noise source (i.e. Railway, major roadway, industry) or where a noise source (commercial or industrial use) is proposed adjacent to a sensitive land use. The report should follow the Ministry of the Environment's OCC guidelines and demonstrate that the appropriate criteria can be achieved. The report must include indoor and outdoor sound levels and recommend mitigation measures for the development which could include sound barriers, ventilation requirements, special building components and necessary warning clauses. The Noise and/or Vibration Study must be prepared, signed and stamped by a qualified Professional Engineer.

This Study must be provided through the Site Plan review process when requested, and a copy will be provided to Building Services.

### 13.7 Environmental Site Assessment

Generally, an Environmental Site Assessment is required for all applications where a land use change is proposed from an industrial or commercial use to a more sensitive land use (i.e., Residential). Initially a Phase I Environmental Site Assessment is required. Further investigation



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would be required when the Phase I Environmental Site Assessment identifies the possibility of site contamination. A Record of Site Condition may be required where a land use change is proposed to a more sensitive land use in accordance with Ontario Regulation 153/04.

This Study must be provided to Building Services.

13.8 Archaeological Report

An Archaeological Report is required for all applications in or near areas of archaeological potential, as determined by the criteria set out by the Ministry of Culture and the CGS Archeological Master Plan. Reports must be completed by an individual holding a valid archaeological license.

This Study must be provided through the Site Plan review process when requested.