PART 4.

4.0 SITE PLAN REVIEW GUIDELINES

CITY OF WATERLOO

Site Plan Review Guidelines (SPRG)

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4.1 INTRODUCTION

The City of Waterloo has prepared the Site Plan Review Guidelines (SPRG) to assist Applicants through the Site Plan review and approval process and their pursuit of Building Permit issuance and performance security release.

Site Plan Control is a process that examines the design and technical aspects of a proposed development to ensure that it is safe, functional and compatible with the surrounding area. The Site Plan process applies to specific types of development established in Section 41 of the Ontario Planning Act and further established in the City's Official Plan policies and Site Plan Control By-law.

Common Site Plan development projects include higher density residential development (eg. townhouses and apartment buildings), mixed use buildings, commercial buildings including office and retail buildings, industrial buildings and institutional buildings.

Mixed use (retail and residential)

Employment (industrial or office)

Retail

Site Plan Control may also apply to building renovations, additions or changes to existing building usability subject to the provisions of the Ontario Planning Act (projects which substantially increase the size or usability of land). Site Plan Control is applicable law and is a common approval required prior to the issuance of a Building Permit. Some forms of development are exempt identified through the City's Official Plan policies and Site Plan Control By-law.

Site Plan Control is a key mechanism to implement the City's Official Plan policies and urban design guidelines subject to the provisions of the Ontario Planning Act. All stakeholders including builders, developers, property owners, City staff, agencies, and Council, should refer to relevant design guidelines in the preparation, review and approval of Site Plan Applications. The City of Waterloo will use urban design guidelines as a component to review and approve Site Plan development.

4.2 HOW TO USE THE SPRG

The SPRG's are intended to be used by City staff, Applicants and commenting agencies in the review and approval of Site Plan Applications. The SPRG's form part of the UDM and has been prepared to:

- identify the key steps and process for Site Plan review and approval;
- identify the basic requirements (submission requirements and checklists) for Site Plan Approval;
- describe the role of the UDM in the Site Plan review and approval process; and,
- establish technical guidelines (standards and criteria) for Site Plan development.

The SPRG's have been prepared based on the current City practices, processes and applicable legislation. As a key part of the Site Plan Application review process, the City will identify the primary design expectations provided in the UDM at the pre-consultation process. It is the responsibility of the Applicant to review the City's design guidelines and to submit development applications that address the City's design and development expectations.

Over time, the Site Plan process may evolve and be updated through regular amendments approved by the delegated Site Plan Approval Authority. The SPRG's are administered through staff and do not require Council approval for future amendments or revisions. In all cases, Applicants are encouraged to contact the City's Site Plan Coordinator for current information affecting the Site Plan review and approval process. The primary intent of the SPRG's are to make the Site Plan process an efficient and effective process for all users.

4.3 LEGISLATIVE AUTHORITY

Site Plan Control is a development approval process administered through Section 41 of the Ontario Planning Act. This Section of the Planning Act gives the City of Waterloo the authority to designate areas (including the entire City) as being subject to Site Plan Control. The entire City is designated Site Plan Control with some exemptions provided in the City's Official Plan and Site Plan Control By-law.

In 2006, the Province amended the Ontario Planning Act (through Bill 51) to expand Site Plan Control to include matters of exterior design, sustainable design and universal design. The Planning Act previously restricted the ability of a municipality to regulate building design features. The City has adopted the implementing Official Plan policies (OPA #72) and Site Plan Control By-law (repealed by-law 91-58 and replaced with by-law 09-085) to enable this legislation. Through OPA #72, the role of urban design guidelines has been strengthened to provide a strong and effective policy basis for urban design guideline implementation. The UDM is the City's primary urban design guidelines and shall form a component for site plan review and approval. The City of Waterloo has also passed the necessary policies and by-law requiring mandatory pre-consultation meetings for Site Plan Applications. Applicants are required to meet with the City staff prior to submitting a Site Plan Application.

Applicants should contact the Site Plan Coordinator in the Integrated Planning & Public Works (IPPW) Department at Waterloo City Hall to determine whether a particular development is subject to Site Plan Control.

4.4 THE SITE PLAN REVIEW AND APPROVAL PROCESS

The Site Plan process is a multi-step process involving the following basic steps, illustrated in a process chart on the following page:

- Step 1: Pre-consultation: Mandatory process to identify site plan submission *requirements, steps* and *design priorities*. Applicants are required to submit a pre-consultation form and are encouraged to submit a development concept. Applicants are expected to address the City's design expectations and standards established in the Urban Design Manual. The pre-consultation process involves a minimum 5 day review period as per the site plan schedule. Refer to the Site Plan Checklists and Notations section for submission requirements.

- Step 2: Preliminary Submission (optional step). Applicants may submit a preliminary site plan submission to identify base urban design and site planning requirements. This process follows the standard site plan review process.

- Step 3: Site Plan Application: The City will accept a complete site plan submission based on submission requirements identified at pre-consultation meeting and checklist requirements provided in the SPRG. Ensure all drawings are *fully* coordinated. Applicants are required to consult Waterloo North Hydro to determine hydro requirements prior to Site Plan Meeting and to submit a "Site Plan Engineering Submission" (a.). A more detailed "Complete Engineering Submission" (b.) is required following Endorsement.

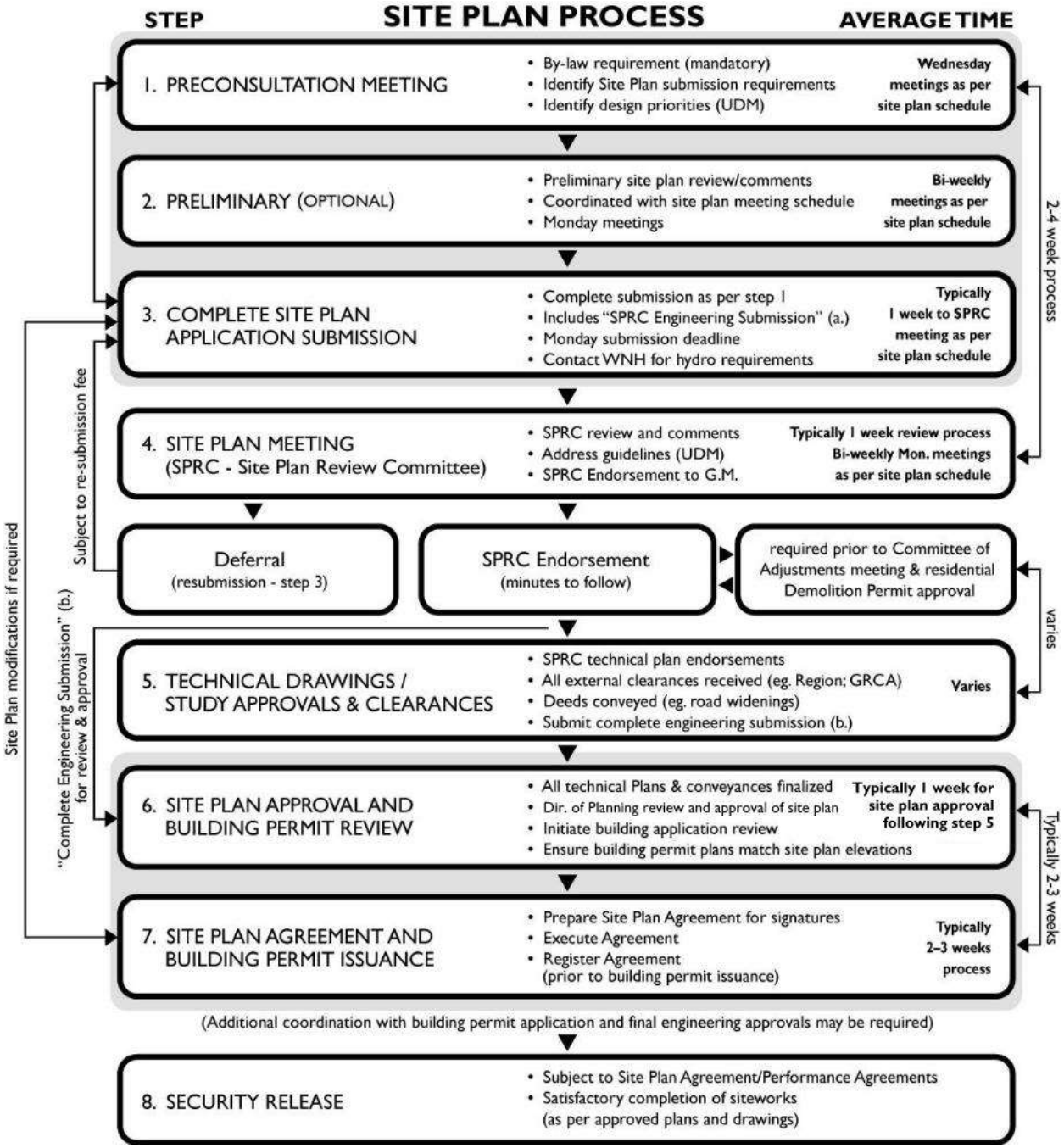
- Step 4: SPRC Meeting: The SPRC meets on a regular basis as per the Site Plan Schedule. The SPRC reviews the submission and through the Chair, delivers a decision to either Defer (resubmit) or Endorse(ment). Endorsement is not an approval and occurs when the Site Plan drawings conform to the City's design and development expectations to the satisfaction of the City's Site Plan Review Committee, and is required prior to the City's Director of Planning reviewing and issuing a decision on the site plan application. An Endorsement is typically required prior to a Minor Variance meeting and for many residential Demolition Permit Approvals. Minutes are provided after the meeting typically within the same week of the SPRC meeting.

- Step 5: Technical Review: Following Endorsement, Applicants will be required to update the site plan drawing submissions based on the SPRC minutes and to submit a "Complete Engineering Submission" (b.). These are required prior to the Director of Planning's review for Approval. Applicants are *responsible* to submit and obtain all *agency* and approval clearances prior to receiving Site Plan Approval. Any road widening must be conveyed to the road authority prior to Site Plan approval and all lot consolidation finalized (if applicable).

- Step 6: Site Plan Approval and Building Permit Review: Once all the plans have been updated to staff's satisfaction, and all Agency comments addressed, the Site Plan Coordinator will present the plans to the Director of Planning for review and a decision on the site plan application. The Director of Planning has authority to approve, deny, and revise the site plan applications. The Site Plan Coordinator will only prepare the Site Plan Agreement once the Director of Planning has approved the Site Plan. Following the execution of the Site Plan Agreement, Applicants may submit Building Permit drawings for review, unless otherwise authorized by the Director of Planning.

- Step 7: Site Plan Agreement and Building Permit Issuance: The Site Plan Coordinator will initiate a Site Plan Agreement with the City Solicitor. This process requires several weeks to complete. Once the Agreement has been prepared and signed by the Owner(s), the Director of Planning has the authority to sign the Agreement prior to registration. Once the Site Plan Agreement has been registered the City can issue a Building Permit.

- Step 8: Performance Security: Performance securities will be released when site works have been completed to the satisfaction of the City subject to the Site Plan Agreement conditions.



4.5 THE SITE PLAN REVIEW COMMITTEE (SPRC)

The SPRC is a team of staff professionals who provide technical and design review comments to the Applicant. The SPRC members include:

Site Plan Member	Role
Site Plan Chair	Responsible to chair the Site Plan meeting, provide Site Plan comments to Applicant(s) and provide a recommendation to the Director of Planning (Site Plan "endorsement" or "resubmission").
Site Plan Coordinator	Responsible for processing, administrating and coordinating the site plan application and process. The Site Plan Coordinator also initiates Agency review comments and facilitates the Site Plan Agreement process.
Urban Design Review	An urban designer from the Planning Approvals Section will provide comments on submission materials as they relate to the City's urban design policy objectives, policies, principles and standards as outlined in various documents including the Official Plan and supplemental manuals / master plans / guideline documents. Will review all matters of urban design including but not limited to Urban Design Studies, Sun/Shadow Analyses, Site Plans, and Building Elevations.
Engineering Review	Representative from Engineering Services to provide comments on the engineering component of the Site Plan submission. Engineering Services staff will provide engineering approval of all technical and functional engineering drawings, studies and reports which are required prior to Site Plan endorsement and prior to Site Plan approval. Engineering Services staff is responsible to coordinate comments with Transportation Services and City Utilities (if applicable).
Landscape Review	A Landscape Architect from Engineering Services to provide comments on landscape plan submissions and tree management preservation. On-site tree management review will be provided from the Environment & Parks Division.
Building Review	Representative from Building Division provides comments on related Building Code requirements such as barrier free accessibility, fire access and separation requirements. The Building Division representative is responsible to circulate comments to the Fire Department regarding emergency access. Applicants may also be required to submit additional studies prior to building permit issuance. The Applicants should consult Building Division staff to confirm what additional studies and analysis may be required, such as fire flow tests, Phase II Environmental Assessments and other requirements.

The SPRC may invite members from other public agencies to provide comments during the Site Plan meeting. The City encourages representatives from the Regional Municipality of Waterloo, Grand River Conservation Authority and Waterloo North Hydro to be involved early in the Site Plan process. Transportation staff from the Regional Municipality of Waterloo regularly attends the City of Waterloo SPRC meetings. **In all cases, it is the responsibility of the Applicant to receive comments and clearances from the commenting agencies prior to Site Plan Approval.**

4.6 OTHER APPROVALS

Following Site Plan endorsement, there is often a series of approvals and clearances required prior to receiving Site Plan Approval. Common approvals and clearances are identified below:

- **City Standards and Policies:** Site Plan development will be subject to other Municipal standards and policies. Relevant standard and policies are noted below, but not limited to:

☐	Development Manual (Engineering)	☐	Percent for Public Art Policy
☐	Transportation Master Plan	☐	Safe Access Policy
☐	Multi-Use Recreational Trail Policy	☐	Fire Access Standards

- **Agency Comments:** Applicants may be required to receive approvals or clearances from a number of external agencies. Applicants are required to satisfy agency comments prior to Site Plan Approval, and often, responsible to submit plans directly to the external agencies. Common agencies are identified below:

☐	Regional Municipality of Waterloo	☐	Ontario One (Hydro)
☐	Grand River Conservation Authority	☐	Ministry of Transportation
☐	Waterloo North Hydro	☐	Ministry of Environment
☐	Other Utility providers	☐	Ministry of Natural Resources

  The City of Waterloo will circulate site plan drawings to most of the agencies however, will not circulate engineering plans. Applicants will be required to confirm submission requirements and to forward technical plans to Agency for approval/clearance. Applicants are encouraged to meet early with Waterloo North Hydro to indicate hydro service needs.

- **Advisory Committees:** For select Applications, the City may circulate development plans to select Advisory Committees for information and comment, such as:

☐	Grand River Accessibility Advisory Committee	☐	Transportation and Trails Advisory Committee
☐	Uptown Vision Committee	☐	Waterloo Park Master Plan Committee
☐	Uptown Business Improvement Association	☐	Municipal Heritage Committee
☐	Public Art and Culture Committee	☐	Other:

- **Statutory Committees:** Site Plan Applications may be subject to a Statutory Committee review and approval such as the Municipal Heritage Committee and the Committee of Adjustment. Applicants are encouraged to submit Site Plan Applications prior to a statutory committee meeting to receive Site Plan 'Endorsement' demonstrating the development is technically feasible and meets minimum design and development expectations. The relevant committee will take this into consideration and deliver their decision. The City will not approve a Site Plan until all approvals and clearances are in place.

- **Demolition Control:** It is City process that Site Plan Applications receive Site Plan "Endorsement" prior to receiving a Demolition Control approval subject to Council policy. Applicants should review the applicable meeting schedules and meet with staff to coordinate these approvals early in the process. Demolition approval requirements are identified at the pre-consultation process.

- **Grand River Conservation Authority (GRCA):** Some projects may be located within areas regulated by the GRCA (including floodplains and areas of steep slopes). Applicants are required to meet with GRCA staff early in the process to identify GRCA requirements and approvals. Some clearances or support in principle will be required prior to Site Plan Endorsement (such as Fill and Alteration Permit approval) while other approvals may be required prior to Building Permit issuance. Applicants are encouraged to consult with GRCA staff to review the GRCA clearance process and GRCA Board meeting schedule.
- **Environmental Remediation:** Some sites may be subject to environmental remediation prior to building permit issuance subject to Applicable Law. In all cases, Applicants should investigate if environmental remediation will be required as part of the Site Plan approval process (as administered by the Region of Waterloo) or required as part of the building permit process. Applicants are encouraged to consult with Building Standards staff early in the process.

4.7 COMPLETE SITE PLAN APPLICATION SUBMISSION

A basic site plan submission includes the following information:

Basic Plan(s)	Copies
• Site Plan drawing (plan size, folded) with pdf.	8
• Building Elevations (folded) with pdf.	4
• Existing Conditions plan (folded)	8
• Landscape Plan prepared by landscape architect (folded)	4
• Fire Access plan (11x17) with pdf.	1
• Site Plan Engineering Submission	4
• Application fee(s)	

All plans and drawings must in metric scale, full plan size and be fully *coordinated* with notation confirming plans have been coordinated and include notation comments established in the Checklists and Notations section. Incomplete applications and un-coordinated plans will be deferred to the next meeting. The City may require additional plans and studies identified at the pre-consultation meeting and through SPRC meeting minutes.

4.8 PRE-CONSULTATION PROCESS AND STUDIES

In addition to the basic site plan submission, Applicants may be required to submit additional studies identified on a “Site Plan Pre-consultation Checklist”. Applicants are required to complete the checklist with basic site information, and staff will complete remaining sections including:

- Agency review comments and clearances;
- Summary of site plan process;
- Site plan submission requirements
- Preliminary design priorities
- Meeting notes

A copy of the Pre-consultation Checklist is available on the City's website and Site Plan Application form. Applicants are encouraged to meet with staff early in the design process to identify and address key design objectives established through the UDM.

4.9 SITE PLAN FEES

All Site Plan Application fees (including Engineering Review fees) are set in the City's Application Fee forms in accordance with the City Fee By-law Schedule. Fees are updated on an annual basis and should be confirmed prior to each Site Plan Application submission. A summary of standard fees and timing is provided below for reference:

Fee	Timing	Amount
Site Plan Submission		
Site Plan Fee	With Site Plan Application submission.	See Fee Schedule.
Site Plan Resubmission Fee	Prior to resubmission meeting	See Fee Schedule.
Master Plan development / multiple phased development	With Site Plan Application submissions.	Separate Applications and fees for each phase and Master Site Plan approval.
After Site Plan Meeting		
Engineering Review Fee	With Complete Engineering Submissions (following Endorsement, prior to Site Plan Approval)	Varies. 5% engineering site works or minimum base fee as per Schedule. Consult Engineering staff for fee.
Performance Securities	Prior to Building Permit Issuance.	Set in Site Plan Agreement.
Development Charges	Prior to Building Permit Issuance. Paid at Building Permit stage.	See Fee Schedule.
Park land Cash In Lieu Fee	Prior to Building Permit Issuance.	Set in Official Plan.
Legal Fees	Prior to Building Permit Issuance or shortly after. Applicants are responsible for any legal costs associated with Site Plan Agreement preparation and processing.	Varies (hourly rate).
Building Permit Fee	Initiate fee payment with Permit Application subject to revisions prior to Building Permit Issuance.	Based on building area. Set out in Fee Schedule.
Other	There may be other fees required through the approval(s) process. Applicants are responsible for any Agency review fees.	Varies. Consult Agency.

4.10 PERFORMANCE SECURITIES

The Planning Act permits municipalities to require the posting of performance securities to be held for the completion of specific site development works. This process ensures that development is constructed to the approved development plans and specifications.

Performance securities are administered through the Site Plan Agreement. The performance security will be released (in some cases partially released) as site works are finished, inspected and certified. If the work is not completed in accordance with the approved plans within the required timelines established in the Site Plan Agreement, the City reserves the right to cash the security performance.

Performance security requirements will be identified through the pre-consultation process or addressed through the SPRC meeting. The City of Waterloo is currently reviewing its performance security process and will provide recommendations through a separate process. The SPRG's will be updated with any future changes.

4.11 MASTER PLANNED DEVELOPMENT

The City of Waterloo promotes Master Planned development, a defined process for larger-scale development projects often subject to Official Plan and/or Zone Change Amendment Applications or for large multi-unit site development projects. Master Planned development is often subject to area-specific guidelines. The City has also adopted Master Planned Guidelines in the Supplement Design Guideline Section to provide guideline direction for a range of development projects.

Master Planned development typically involves multiple buildings located on a single lot and development is typically developed in stages. The City of Waterloo will require separate Site Plan Applications for each stage of development, and may (1) require a parent Master Plan Agreement to provide comprehensive conditions for the entire development or, (2) may require special conditions in each Site Plan Agreement that relate to the comprehensive development plans subject to a Master Plan drawing approvals.

Applicants will be responsible to prepare a Master Site Plan drawing showing the development stages on the Plan, as well as, site development statistics for each stage of development and separate development statistics for the entire development to assist with development review process and zoning analysis. Applicants are encouraged to meet with the Site Plan Coordinator to discuss the best approach to process multi-stage development proposals.

For sites with multiple easements, the City may require a Master Easement Plan to show the approximate location of all proposed easements on the site with a key plan indicating the intent of each easement. Detailed easements will then be shown on each Site Plan submission in more detail.

4.12 SITE PLAN AGREEMENTS AND CONDITIONS

A Site Plan Agreement will be required for most site plan development, particularly for new development projects, building additions and change in intensity of use. The City may also require modifications to an existing Site Plan Agreement for any changes to approved site plan drawings.

The City has a standard Site Plan Agreement format. The City may add new conditions to the Agreement or incorporate as a separate schedule to accommodate special studies, multi-staged site development and other unique considerations for the site development. The City will identify potential conditions during the pre-consultation process and work through the Site Plan process to prepare an implementing Site Plan Agreement. Prior to preparing a Site Plan Agreement, the Applicant is responsible to:

- secure all internal approvals (endorsements from SPRC members including Complete Engineering Submission approval(s);
- secure all agency approvals and clearances, such as Regional Municipality of Waterloo Access Permits;
- with multiple properties, consolidate the lot;
- convey all necessary easements to the appropriate authority such as municipal road widenings; and,
- receive approval from the General Manager of Development Services.

4.13 SITE PLAN STANDARDS & CHECKLISTS

The City of Waterloo has established a series of technical standards and checklists for Site Plan development. These standards have been prepared by staff and provide for safe, functional and compatible development and shall be used as a basis for Site Plan Approval.

SPS 1: SITE PLAN CHECKLISTS AND NOTATIONS

The Site Plan Checklists and Notations section has been prepared to identify minimum site plan drawing submission requirements to be accepted by the City. Applications which do not follow these checklists or notations will be considered incomplete. Applicants are responsible to review these standards and to incorporate into the drawing submissions.

A) General Checklists

- All plans must be in full scale and to a legible metric scale generally not greater than 1:500.
- All site plan drawings, landscape drawings, fire access plans, must be folded.

- All text and plans must be fully readable/legible with appropriate scaled font size and line work.
- All plans must contain sufficient dimensions to evaluate building setbacks, separation distances, accessibility and slopes.
- All plans must be prepared by an accredited professional(s).
- All plans must be fully coordinated. Basic site information, such as building footprints, site grades, site features, and existing conditions, must be coordinated on all plans.

B) Site Plan Drawing Checklist and Notations

Basic Site Plan Drawing Checklist:

	Basic Technical Information		Basic Design Information
☐	Basic site data chart with street address information, north arrow and location map	☐	Building entrance and emergency access locations
☐	Abutting streets identified and labeled	☐	Parking and loading areas with all line painting
☐	Preliminary Building Code Matrix	☐	All site utilities such as hydro poles, hydro vaults, transformers, bell boxes, fire hydrants
☐	Existing site features to be retained		Identify barrier free and visitor parking spaces
☐	Basic surrounding site information such as boulevard dimensions and details, driveway entrances, hydro poles, major grade changes, trails, approximately building setbacks etc…	☐	Basic car and truck turning radii to demonstrate adequate circulation and turning movement
☐	Building location with building dimensions	☐	Bike parking spaces.
☐	Clearly identifiable property boundary excluding road widening conveyance (heavier line weight)	☐	All site sidewalks, curbing, surface treatments identified and labeled.
☐	Road widenings as per Official Plan Policy	☐	Landscape areas (only show area)
☐	Zoning setback lines (medium line weight)	☐	All fence and retaining wall locations
☐	Basic dimensions such as building setbacks, buffer dimensions, walkway dimensions, driveway width, parking spaces, underground parking setback etc…(lighter line weights)	☐	Location and screening of outdoor garbage and recycling facilities or any other utility facility
☐	Site slopes or grade changes related to ramps, walkways, barrier free access routes with spot elevations etc…	☐	Mail delivery area/post office box location
☐	Daylight triangles as per Zoning requirements, SPRG and Regional Requirements	☐	Snow storage area(s)
☐	Easements	☐	Building signage location
☐	Designated Fire Route	☐	Outdoor light fixtures
☐	GRCA floodway delineation boundary	☐	Location of rooftop equipment and screening features (show on building)
		☐	Location of nearest fire hydrant

Refer to Site Plan Standards for daylight corner requirements. In all cases, any road dedication (for road widening or regional daylight corner) will affect the site area calculations and building setback line(s).

Standards Site Data Chart shall include the following information:

Site Plan Data Chart	Proposed	Required
Property Address(s): • Identify existing property addresses: • Identify Assigned property address: (assigned by Building Division)		
Number of consolidated lots:		
Site Area: • Existing Site Area: (in square metres and hectares) • Road Widening Area: (in square metres for Regional Roads) • Site Area: (in square metres and hectares excluding Regional road widening)		
Property Zoning: List all zoning categories that apply to site		
Site Specific Zoning (Special Provisions):		
Impervious Cover Limit (if applicable):		
Setback Information: • Front Lot Line (identify the front lot line): • Front Yard Setback: (show on plan) • Side Yard Setbacks: (list for each yard) • Rear Yard Setback: • Underground Parking Setbacks: (show location of parking structure)		
Parking Information: • Total parking spaces provided (list by use and parking requirement): • Identify parking calculations/method • Barrier Free Spaces: • Bike Parking Spaces:		
Previous Committee of Adjustment Application Approval: • List application number, file number and relief		
Total building height: • Building Storeys: (list number of storeys) • Building Height: (in metres)		
Density Information: • Building Coverage (building coverage/site area excluding road widening area): • Total GFA (in square metres, list by use): • Total Units: • Total Bedrooms: • Total Density/BPH (beds per hectare calculation excluding road widening area):		
Landscaped Area (sm): (in square metres and hectares)		

Site Plan drawing notations:

- All Site Plan drawings are fully coordinated with Landscape and Engineering drawing submissions.
- The property Owner is responsible for right-of-way replacement or repair costs to City standards.
- All site lighting shall not result in any glare or spill over to surrounding properties or public view.
- All rooftop mechanical equipment shall be fully screened from public view and surrounding residential properties.
- All snow storage shall be stored on site. Surplus snow storage shall be removed off site at Owner's expense by private removal service.
- Optional: Outdoor storage shall be located behind building in rear yard.
- Optional: The Site Plan application forms part of a multi-phase development approval. Future development is required to be coordinated with Site Plan Approval [add file here], approved through a separate Site Plan application.

C) Existing Conditions Plan Checklist

- Show property boundary;
- Show all municipal right of way utilities including sidewalks, hydro poles, bell boxes, hydro vaults, manholes etc;…
- Show location of building setback on abutting properties;
- Show vegetation include trees and hedges *and* location of vegetation located on adjacent lands near property line;
- Show fences;
- Show site grades with contour lines and retaining walls;
- Show driveways and curbing;
- Show site servicing connections (if available); and
- Other existing features.

D) Fire Access Plan

A Fire Access Plan is required for most projects to identify basic emergency access and fire protection measures for site development. The Fire Access Plan will be reviewed by the SPRC and forwarded for information to Waterloo Fire Rescue. The Fire Access Plan is a simple site plan drawing showing:

- Municipal street address;
- Site location plan;
- Property boundary;
- Building location(s) and building entrances (identify if primary entrance, secondary entrance or emergency access door);
- Driveway entrance(s) and parking area;
- Sidewalks
- Retaining walls
- Hydro poles and utility wires
- Fences
- Fire route with turning radius plans
- Fire route signage
- Standpipe location(s)
- Fire hydrant location(s)

E) Building Elevation Checklist and Notations

Elevation submission for Endorsement:

- Show property address and site plan application number
- Elevations drawings for each building elevation (ensure correct elevation is identified)
- Detailed elevation drawing showing building massing and design elements including all architectural features, materials and colours labeled
- Show location (and design) of municipal street address and light fixtures
- Show location of rooftop equipment and screening feature(s)
- Show building height in storeys and floor height (in metres)
- Show average grade
- Identify property line ("PL")

Elevation submission for Director of Planning Review and Approval:

- Coloured site plan elevations and/or renderings will be required for Director of Planning review and approval.

Building Elevation Notations:

1. The approved building elevations shall form the basis for the Building Permit Application.
2. Any substantive change(s) or modification(s) to the approved site plan building elevation(s) shall require a modification to the approved building elevation drawings by the delegated site plan approval authority.
3. All site lighting shall not result in any glare or spill over to surrounding properties or public view.
4. All rooftop mechanical equipment shall be fully screened from public view and surrounding residential properties.
5. Building colours may be subject to minor adjustments in tone and/or shade.
6. Any proposed signage is for illustration purpose(s), and subject to City of Waterloo Sign By-law.

Street Elevation Plans:

1. Show proposed building elevation (street frontage) and surrounding building elevations.
2. Design elevation to match or coordinate with surrounding buildings (where appropriate).
3. Provide materials, architectural elements and features that complement surrounding buildings and enhances streetscape charter.

F) Context Plan

A Context Plan is recommended for most site plan applications to assist in the Building Elevation review and approval process and addressing City design guidelines related to sympathetic design, compatible development and character. Context plans provide a tool to facilitate elevation approvals by demonstrating how the proposed development, and elevations, fit within the existing or evolving context of an area. A Context Plan may be a simple analysis including area photos and summary of building materials, styles and colours or, a more detailed study including a historical context of surrounding area, more detailed analysis of surrounding built form, building design and architectural elements. A variety of drawings may be used in support of the proposed elevations, including street elevations, streetscape drawings and material boards.

Context Plan for 116 University Avenue West

Surrounding Buildings (photographs)

Proposed elevation based on analysis

Detailed rendering

An architects or qualified designer should prepare a Context Plan and elevations based on the applicable guidelines and surrounding context. The purpose of the Context Plan is to justify the proposed elevation(s) and to improve building elevation review and approvals.

G) Cross Section Drawings

A cross section drawing may be required to illustrate a cross section of the site and surrounding features to evaluate building scale, site grades and relationship to existing and surrounding vegetation. More specifically, a cross section drawing is to show:

- Property line(s) and dimensions
- Existing and proposed grading (with spot elevations)
- Proposed building(s), proposed retaining walls, existing and abutting trees/vegetation.
- Underground parking structure (if proposed)
- Surrounding buildings

Illustrative example showing coloured cross section drawing (BarrelYards Project)

H) Landscape Drawing Checklist and Notations

Landscape Plans shall include the same basic site plan drawing information with additional information noted below excluding building code matrix and site data chart information:

Basic landscape plan checklist:

	Basic Technical Information		Basic Design Information
☐	Landscape data chart showing all plant specie names, units.	☐	Location and identification of all plant materials with spot elevations. Coordinate with landscape data chart.
☐	Existing trees located on site or abutting properties.	☐	All site utilities such as hydro poles, hydro vaults, transformers, bell boxes, fire hydrants.
☐	Spot elevations across site and abutting properties. Provide spot elevations near trees, drainage areas, ramp areas, retaining wall areas and other locations with change in grade.	☐	Any stormwater management features including swales, ponds, green roofs.
☐	Show drip lines for all existing trees (including abutting lands) and identify measures to be utilized for protection if pertinent. Show drip lines for vegetation located close to development property.	☐	All pedestrian routes with dimensions. Identify surface material and colour.
☐	Dimension of all landscape buffer areas. Landscape buffers should include a mix of all season trees, shrubs and perennials/grasses	☐	Amenity areas with dimensions. Identify pavement details, materials, colour, site furnishings and other details on plan.
☐	Tree preservation plan, when required including trees located adjacent to site (if required)	☐	Sign and retail display areas with supporting landscape features.
☐	Show location of underground utilities and underground parking structures.	☐	Details for retaining walls, entrance features, fencing, retaining walls, garbage enclosures details, paving details, street furnishings, site lighting fixtures and typical plant installation and typical tree preservation details.
		☐	Spot elevations.

Landscape Submission Requirements:

1. All Landscape Plans must be prepared and stamped by a qualified landscape architect. All Landscape Plans must be stamped by professional architect.
2. The City may consider Plans prepared by a landscape designer for small additions or renovation projects.
3. All proposed plant material must be drawn to scale equivalent to 10 years growth.
4. All proposed plant material must be native to the Region of Waterloo subject to the satisfaction of City.
5. Plant material chart to be located on Landscape Plan and lists: plant material key, both common and botanical names of species, quantity, size, on-centre spacing, general remarks.
6. Ensure plant material does not obstruct sight line views. Review daylight corner requirements and select plant materials to comply with regulations or guidelines.
7. Provide details of all elements and furnishings proposed on landscape plan including special paving details, typical fence construction detail, retain wall system detail and street furniture details.
8. Landscape Plans must be coordinated with Engineering Plans, particularly as it relates to site grading information, tree preservation areas with spot elevations, retaining wall location and details and swales.

Landscape Plan Notations:

1. All Landscape Drawings are fully coordinated with Site Plan and Engineering drawings submissions.
2. The property Owner is responsible to implement the approved Landscape Plan and Tree Preservation Plans. The Owner is financially responsible for all replacement costs for a two year warranty period.
3. Optional notation for tree preservation:

    a) The property Owner is responsible for any impacts, damage, remediation and replacement to existing vegetation located on-site and abutting properties. Tree replacement shall be to satisfaction of the City.
    b) No trees shall be cut or removed without the written permission of the City Forester.
    c) The property Owner is responsible to prune or replace any damaged trees or vegetation on site.
    d) Landscape Architect has met with City Forester on [insert date of meeting] and finalized plant material list and tree preservation strategies.
    e) Landscape protective fencing will be installed prior to start of site works and shall be maintained for the duration of construction. Certification of installation is required prior to Building Permit.

References:

- Further information regarding size, planting specification etc. can be found in the Urban Forest Policy (City of Waterloo Parks & Environmental Services, June 1998). Contact SPRC Landscape Architect for more information or recommendations.
- List of preferred Species for Street Trees is provided in Site Plan Design Standards.
- Development Engineering Manual (2013) as amended or the successor manual.
- SPRG landscape and buffer standards.

I) Engineering Submission Checklists

- Engineering review and approval is a multi-step process.

- Separate engineering submissions are required for the Site Plan Application submission, followed by a more detailed engineering submission after Applicant's have received Site Plan Endorsement.

a. Site Plan Engineering Submission – submitted with Site Plan Application Package for SPRC Review and Endorsement

- A functional engineering design including a Functional Grading and Functional Servicing Plan is required as part of the Site Plan Application (Step 3 in the Site Plan Process).

- The Functional Grading and Functional Servicing Plan must include, at a minimum, the following:

    - existing topographic contours;
    - all existing vegetation, utilities, infrastructure;
    - all Proposed Site Plan items;
    - proposed grading; and,
    - proposed service connections and infrastructure (such as infiltration gallery/cistern)

b. Complete Engineering Submission – detailed engineering submission following Site Plan Endorsement with Engineering approval required prior to Site Plan Approval.

Site Plan Approval is subject to review and approval of a complete engineering design package.

When all engineering design details have been finalized a complete engineering package must be submitted directly to the Engineering Services, for review and acceptance (Step 5 in the Site Plan Process).

The engineering submission must be made to the SPRC Engineering representative. Applicants are advised to consult the City's Development Engineering Manual (2013) as amended or the successor manual for details on submission requirements.

The complete engineering submission must be accompanied with an Engineers Cost estimate for the total cost of site servicing (i.e. undergrounds) and surface works. As per the Council approved Fees & Charges, 5% of this total cost estimate will apply as a non-refundable engineering review fee, or an alternative minimum fee as determined by the Director of Planning or his/her designate in consultation with the Director of Engineering Services.

The following items are required, as applicable, for the complete engineering design package:

- Grading & Filling Plan;
- Phase II ESA Reports (if Record of Site Condition is required);
- Storm Water Management (Quality and Quantity control); sites that warrant underground structures for water quality will require a City easement to be registered on title;

- Capacity Analysis of sanitary, storm and water;
- Salt Management;
- Erosion and Sediment Control;
- Site Servicing (including Water Metering Plan);
- Geotechnical Report; and
- Any other study required for a complete engineering review.

All engineering drawings/plans must be coordinated and be consistent with other approved plans (matching scale, layout, reference points, major infrastructure).

All engineering submissions must be developed by a Licensed Professional Engineer (in good standing with a valid Certificate of Authorization from the Association of Professional Engineers of Ontario) with all plans and reports dated, stamped and signed.

The Applicant should satisfy themselves that all other services are not in conflict and applicable agencies have provided their clearances.

A Site Alteration Permit is required for any site development >1ha or as required by the Director of Engineering Services in accordance with the City's Site Alteration By-law as amended. The application for the permit, with applicable fees and securities, must be submitted to Engineering Services for approval.

c. Prior to Issuing the Building Permit

Prior to the issuance of a building permit the following items must be addressed:

1) Engineering Approval: The completed engineering submission must be approved by the Engineering and Construction Division, together with any necessary agency clearances (e.g. Grand River Conservation Authority, Region of Waterloo);

2) Payment of Fees: Applicable fees and securities with respect to any works within the right-of-way (i.e. servicing, new or repaired curb, sidewalk, boulevard, curb cuts etc.) must be paid by the registered owner;

3) Private contractor information: The owner will be required to provide information about any private contractors proposed to complete service connection work within the City right-of-way. The use of private contractors will be subject to City approval and other requirements (i.e. insurance, WSIB clearances, health and safety, indemnification);

4) Construction Staging Plan: A Construction Staging Plan will be required prior to sign off for issuance of a building permit. This plan shall show the surveyed property boundary and identify anticipated construction activities, including items such as:

    - location of material stockpiles;
    - designated construction parking;
    - location of the site trailer and potable toilet(s);
    - area designated for unloading material;
    - sediment and erosion controls with details;

- construction hoarding or fencing around the site with details, to comply with Ontario Health and Safety Act and Regulations for Construction Projects 0.reg.231/91 s.65;
- note that the boulevard is not to be used for any construction purpose;
- note that existing sidewalk is not to be removed until the contractor is ready to replace sidewalks;
- note that sidewalk and bike paths are to be maintained and safe pedestrian access is provided through out the duration of construction; and
- indicate the construction entrance with details.

5) Erosion and Sediment Control: Prior to the issuance of a building permit the following is required:

- a letter of compliance (signed and stamped by the owners engineer) for the sediment and erosion controls shall be provided to the Engineering and Construction Division; and,
- an inspection by a staff member of Engineering Services will be undertaken to confirm the City's acceptance of those controls.

d. Additional considerations/requirements:

1) Traffic Control

Any construction work within the traveled portion of a roadway is prohibited until formal written authorization from the City's Integrated Planning & Public Works Department is obtained. A traffic control plan (including signage considerations) will require approval by Transportation Services staff.

The use of the City boulevard and sidewalk (other than one (1) approved construction access point) is not permitted unless a license agreement for temporary construction is granted by the City. A separate application and fee is required and the permission to use the City boulevard and sidewalk to facilitate private construction is subject to approval by the Integrated Planning & Public Works Department and is not guaranteed, and may be denied.

The following items may be deferred to the Building Permit (BP) review process provided that the applicant recognizes that the BP review may take longer as a result, and shall be submitted directly to the Integrated Planning & Public Works Department prior to issuance of the BP.

- Construction Staging Plan
- Dewatering plan
- Shoring and Tie back plan
- Drainage Control; Certificate of Approval from M.O.E. in accordance with Section 53 in the Ontario Water Resources Act for overland flow discharge directly to a receiving water body
- Encroachment Agreement
- License Agreement

Release of Securities (Step 8 in the Site Plan Process)

Prior to any release of all or part of the development agreement, performance deposits or financial securities (e.g. letters of credit), the owner's engineering consultant will be required to certify that all site servicing, grading and storm water management has been constructed as per the final engineering approval and is functioning as designed/intended. Arrangements for final inspections are to be made with staff of Engineering Services. Securities will not be released to the owner until all outstanding deficiencies are corrected and all required records/drawings are submitted to the City, to the satisfaction of the Director of Engineering Services.

References:

- City of Waterloo Urban Storm Drainage Policy
- City of Waterloo Development Manual
- City of Waterloo Sidewalk Policy

SPS 2: Site Plan Standards (SPS)

Technical design standards have been prepared for:

A)	Street Addressing
B)	Daylight Corners
C)	Parking and Accessibility
D)	Turning Movements
E)	Fire Protection
F)	Bike Parking
G)	Tree Preservation
H)	Landscape and Buffers
i	Preferred Shrub and Tree Species
ii	Perimeter Landscaping
iii	Buffers and Swales
iv	Fence Details
v	Habitable Room Separation
I)	Waterloo North Hydro (draft)
J)	Outdoor Lighting Criteria
K)	Shadow Study Criteria
L)	Nodes and Corridors Standards

A: STREET ADDRESSING

The City of Waterloo has developed technical guidelines for Street Addressing in consultation with Waterloo Fire Rescue. These guidelines will be reviewed through the Site Plan process and administered by the Building Standards Division. The following standards apply to street addressing and site plan approval(s):

- **Municipal address shall be assigned by Building Standards Division and shall be incorporated into the Site Plan Agreement;**

- Street address signs shall be located within 2 metres of primary building entrance(s). Exceptions may be provided subject to written authorization from the City.

- The primary street address sign shall be at least 150mm (6") in height. Address sign shall be visible from the street and shall be located within 30 metres of the street line.

- The primary street address sign shall be at least 300mm (12") in height if building is located 30-60 metres from street line.

- Street address signage shall require approval from the City's Building Division and Waterloo Fire Rescue if building is located more than 100m from the street line.

- Street address signs shall be clearly visible and identifiable on the building elevation. Contrasting colours or fixtures shall be required to clearly distinguish the address sign.

- Sites with multiple buildings:

    - Individual properties are expected to have one municipal street address.
    - Each building shall have a corresponding suffix address such as Building A, Building B, Building C.
    - Separate street address will be provided subject to creation of new property boundary or to satisfaction of Building Standards Division.
    - Sites with multiple buildings are encouraged to provide a "Multi-Unit Sign" located at the front driveway entrance (right hand side outside daylight triangle area). This sign is to show basic site plan information with building identification, surrounding street names and landmarks. Basic fire fighting information is to be provided. All signs to be constructed of durable (decorative) material with weather protective surface. The content of multi-unit signs should be approved by the City's SPRC in consultation with Waterloo Fire Rescue and Building Standards Division staff.

- Multi-tenant buildings:

    - Individual properties are expected to have one municipal street address.
    - Each unit shall have a corresponding suffix address such as Unit A, Unit B, Unit C.
    - A separate street address will be required when or if a property is severed or under separate ownership.

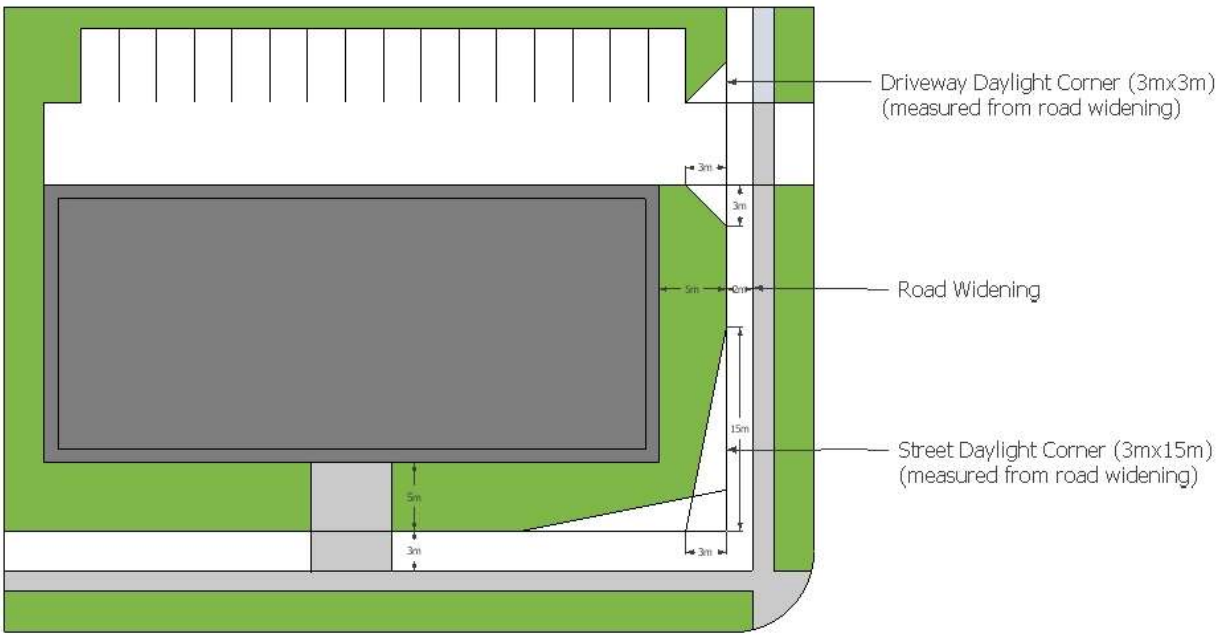
B: DAYLIGHT CORNERS

A Daylight Corner is a triangular setback measured from the corner intersection (at property lines) to provide unobstructed views for motorist and pedestrian safety. At street intersection locations, Daylight Corners are established by the City of Waterloo and the Regional Municipality of Waterloo. Different requirements apply to City and Regional daylight corners.

The City of Waterloo requires the following daylight corners at municipal street intersections and at driveway intersections:

- City of Waterloo street daylight corner: A 3.0m x 15m triangle (by-law requirement)
- City of Waterloo driveway daylight corner: 3.0m x 3.0m triangle (site plan standard)

The City of Waterloo Street Daylight Corner standard is established in the Zoning By-law and must be shown on the Site Plan drawing as a "setback line" subject to height restrictions. A separate Daylight Corner is established at driveway intersections (site plan standard). In both cases, municipal Daylight Corners remain part of the property area and are not conveyed to the City. Low level landscaping is permitted within the daylight corner(s) subject to zoning height restrictions. Site signage and trees are not permitted within the daylight corner.



The Regional Municipality of Waterloo also requires Daylight Corners however, these are to be identified on a reference plan and conveyed to the Region prior to site plan approval. Applicants must exclude the land area requirements of the daylight corner, and any required road widening, from the development proposal resulting in less land area and density potential on the site. Building setbacks are measured from the conveyed property boundary. Identify "Road Widening Dedication" on site plan drawings. Contact the Region of Waterloo for more information.

C: PARKING AND ACCESSIBILITY

General Note: Parking may be regulated by the City of Waterloo Zoning By-law as amended. In cases of potential conflict, the City's Zoning By-law and any other applicable legislation shall prevail. Universal Access standards shall be subject to Ontario Building Code Act requirements, the City's Zoning By-law, the City of Waterloo Accessibility Standards (2016) as amended, and to SPRG standards.

Parking Standards:

- Standard Parking Stall Dimension: 2.8m x 5.5m, unless otherwise stated in the City's Zoning By-law
- Parallel parking space: 2.8m x 6.5m, unless otherwise stated in the City's Zoning By-law
- Curbing: all parking areas are to be curbed with minor exceptions for site drainage and engineering purposes. Different standards may apply on Regional Roads.
- Corner parking spaces: provide minimum 3.0m x 5.5m parking space where one side abuts a wall or column, unless otherwise stated in the City's Zoning By-law. Provide minimum 3.2m x 5.5m parking space where both sides abut a wall or column, unless otherwise stated in the City's Zoning By-law. Provide minimum 2.8m x 5.5m parking space with 1.2m hammerhead for surface parking areas, unless otherwise stated in the City's Zoning By-law.

Barrier Free Parking Standards:

- Type A Accessible Parking Space dimension: 5.5m x 3.7m
- Type B Accessible Parking Space dimension: 5.5m x 2.4m
- Accessible Parking Access Aisle dimensions: 5.5m x 1.5m
- Curbing: provide flush curbing for barrier free parking adjacent to walkways with gentle slope tapering across abutting parking spaces to avoid sharp change in grade.
- Barrier free parking target: minimum of 5% barrier free parking for the number of parking spaces required however, not less than the City of Waterloo Accessibility Standards (2016) as amended or the City's Zoning By-law, whichever is more restrictive.

Drive Aisle Standards:

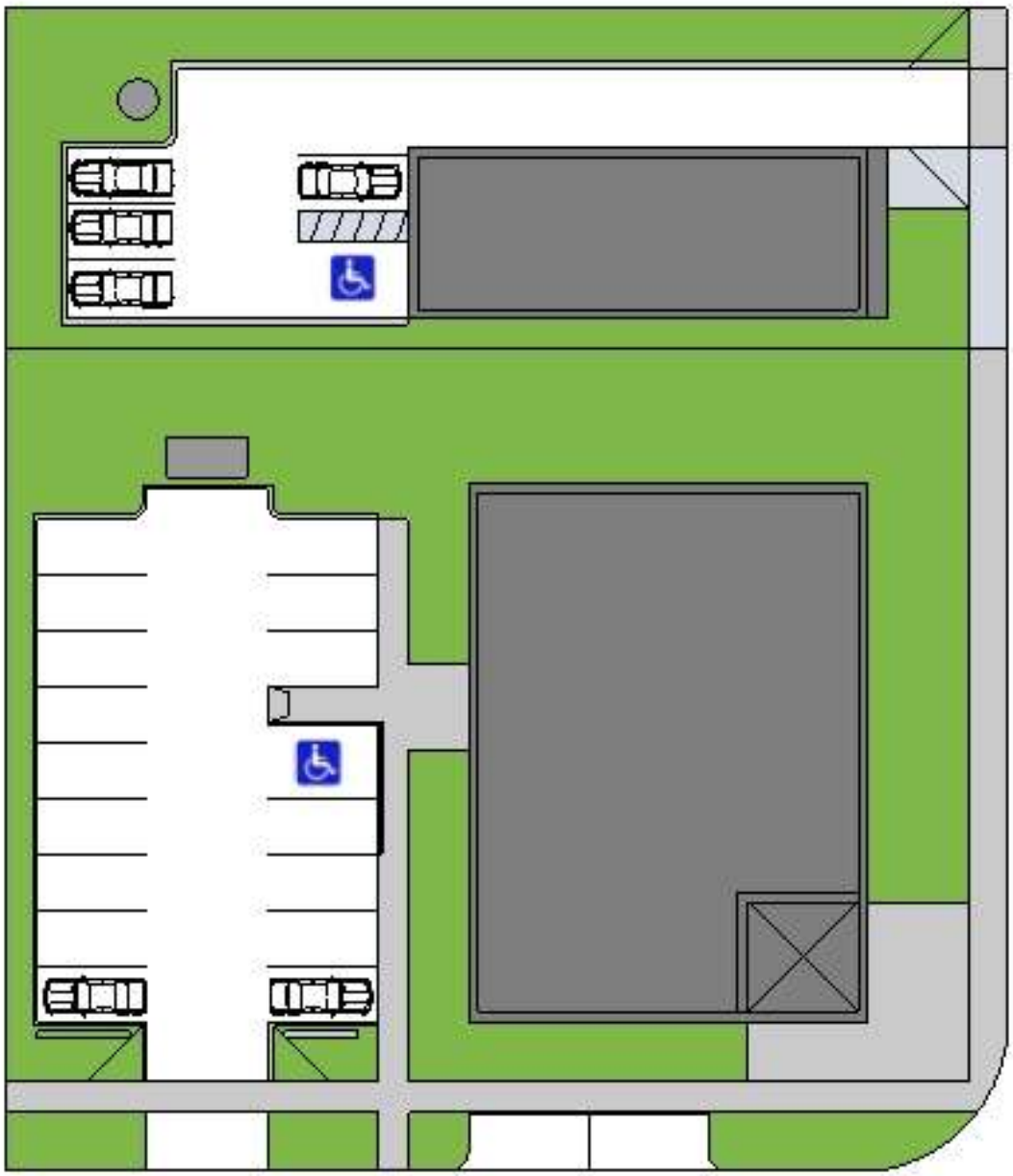
- Minimum 6.1 metre wide driveway (two-way) is required for all development including residential development with 10 or more parking spaces (established in Height and Density By-law, unless otherwise stated in the City's Zoning By-law). A minimum of 3.0 metre wide driveway may be provided for residential development with less than 10 parking spaces, unless otherwise stated in the City's Zoning By-law, and shall not conflict with other requirements including landscape strip and barrier free access routes. Wider drive aisles may be required to accommodate service vehicles (SPS D: Turning Movements)
- The City may permit wider drive aisles for primary vehicular routes, internal transit routes, designated fire routes and proposed bike routes.
- Minimum one-way drive aisle: 3.5 metres with no obstruction, unless otherwise stated in the City's Zoning By-law.
- Maximum driveway width: 7.5 metres, unless otherwise stated in the City's Zoning By-law.
- On *Regional Roads*, with more than 6 residential units, the Region typically requires a minimum 6.1 m wide driveway. Contact Regional Municipality of Waterloo for current standards.

- Contact Regional Municipality of Waterloo regarding Regional Road access requirements

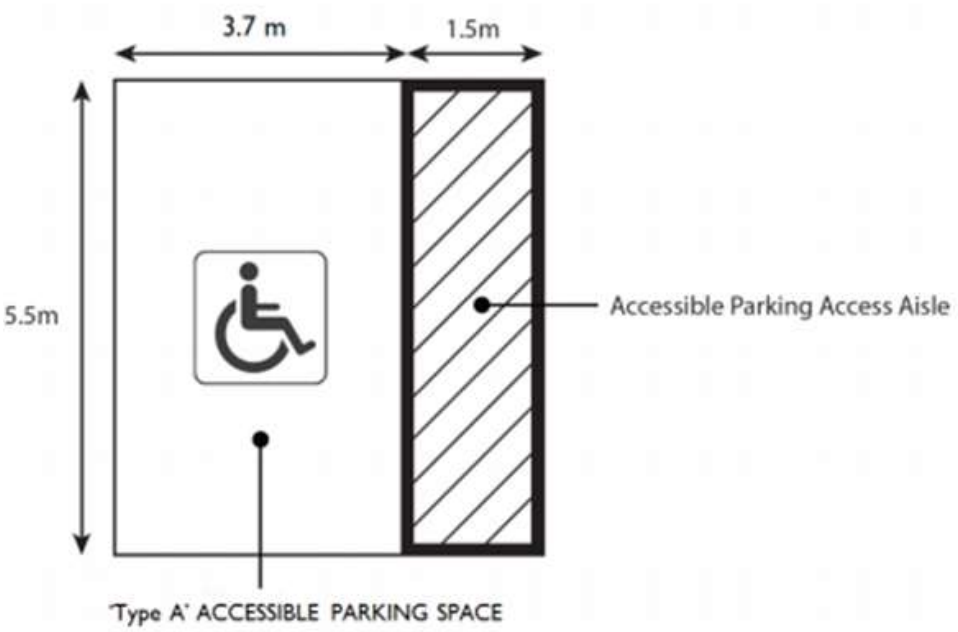
Sidewalk Standards:

- Sidewalk must meet minimum Ontario Building Code and Engineering requirements.
- Encourage minimum 1.5 metre internal sidewalks;
- Encourage minimum 2.5-3.0 metre width for primary internal walkway connections.
- Encourage minimum 2.5-3.0 metre sidewalk width located between store fronts, central internal parking areas and outdoor display/outdoor retail areas where permitted.

Basic parking dimensions and access (surface parking):



Basic Barrier Free Parking dimensions and access (surface parking area):



D: TURNING MOVEMENTS

A basic principle for all site development is to provide minimum turning radius requirements for a range of vehicles, particularly for basic site servicing needs such as site delivery vehicles, garbage collections, moving, and loading zones which involve different vehicles such as cube vans, semi-trailers, tractor trailers, delivery vehicles and garbage truck and buses. All sites should be designed to accommodate basic turning movement needs and demonstrate through the site plan review process. As a basic standard, all loading and site access areas must be accommodated on the site and not located on the public right of way. The following principles and technical guidelines will be applied as a guide to accommodate large vehicles on site.

1. Principles:

To design sites to accommodate site functions through the following principles:

- Design sites to accommodate basic site functions on site rather than off-site locations.
- Provide adequate turning movements and zones for large vehicles on site – showing turning movements on site plan drawings;
- Design landscape islands and drive aisles to accommodate truck turning movements—show truck turning movements on all site plan drawings; and,
- Encourage direct (forward motion) loading and access movements. Minimize reverse turning movements on site, public right of way and avoid long reverse movements particularly along steep grades and turning movements.

2. Garbage Truck Movements:

- Design for minimum 18.0 m straight head-on approach to collection area where possible.
- Provide minimum centre line turning radius of 12.0m for all truck movements. Alternatives will only be considered subject to adequate justification and access.
- Access driveways must be a minimum of 6.1m wide at the point of ingress or egress, turning movements and a minimum of 4.5 m through out the site.
- Provide minimum vertical clearance of 4.4m along route.
- Design access route with 50mm compacted depth of HL-8 asphalt (base course) and 40 mm compacted depth of HL-3 asphalt for the top course (as per City's Development Manual specifications).
- Loading areas must not be more than 0.6m above grade and must be at +/- 2% level.
- Design external garbage container dimensions to be an average of 2.0m wide and 2.0m deep for 6 yard bin type. Alternatives may be considered on a site by site basis.

3. Vehicular Dimensions and Standard Turning Movements:

			Avg.	Center Line	
Category	Vehicle	Type	Dimension	Turning Radius	
Cars	Passenger Car	P		6.3	
Trucks	Light single unit truck	LSU	5.3		
	Cube Van	MSU	10.1		
	Medium Single Unit Truck	MSU	10.1		
	Heavy Single Unit Truck	HSU	13.1		
	WB-19 Tractor Semitrailer	WB-19	12.8		
	WB-20 tractor semitrailer	WB-20	13.1		
	A-trains	ATD	11.2		
	B-trains	BTD	12.5		
Buses	Single unit buses	B-12	12.2 x 2.4	12.9	
	Articulated buses	A-Bus	18.3x2.4	13.1	
	Intercity buses	I-Bus	14 x 2.4	13.9	
	Fire truck	I-Bus	14 x 2.4	13.9	

E: FIRE PROTECTION

The City of Waterloo supports site development that meets minimum Building Code, City Engineering requirements and Fire Code access requirements, but also, minimum standards that accommodate the local Fire Rescue emergency response requirements as it relates to emergency access, minimum fire truck turning movements and accessibly criteria.

To assist with functional and safe site development, the City of Waterloo will require a Fire Access Plan showing basic information discussed in the Site Plan Checklist section. Other Fire Protection standards are identified below and may be updated on a regular basis:

Fire Routes shall:

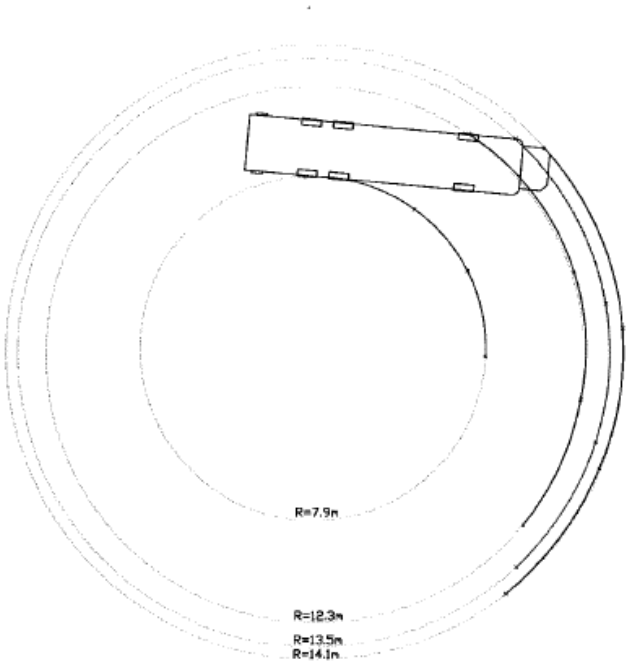
- Show designated fire routes on site plan drawings and engineering plans.
- Be designed to meet minimum legislative requirements and local fire fighting needs and equipment.
- Direct fire access may be provided if the primary building entrance is located within 15m of street curb line.
- Must have a clear width of 6.0m at all times and be connected to a public thorough fare. Changes in direction of route will require a radius in conformance with the following standards:

    - Setback: Be located not less than 3m and not more than 15m measured horizontally from each face of the building required to face a street;
    - Overhead Clearance: Have an overhead clearance of not less than 5m.
    - Grades: Have a change in gradient of note more than 1 in 12.5m over a minimum distance of 15m.
    - Turning Radius: Have a centre line turning radius of not less than 12m with respect to any change in direction of the access route complete with a 3m clearance from the center line to any obstruction such as islands or parking.
    - City of Waterloo Aerial Truck: Design sites to accommodate the City of Waterloo Aerial Truck Model with inside radius of 7.9m and outside turning radius of 14.1 m radius.
    - Access: Where fire routes are more than 90m in length, a 27.4m turnaround shall be provided. If a turnaround is not possible, a hammerhead of 6.1 x 24.4 m shall be provided. Alternative turning dimensions may be required subject to site configuration and grading.
    - Emergency Access Routes: Constructed in accordance with City's Engineering Standards and Building Code.
    - Compaction: Design fire access route and underground parking structures, to accommodate fire fighting vehicular weight loads.

- Secondary emergency access is required when buildings are located more than 90m away from public street.

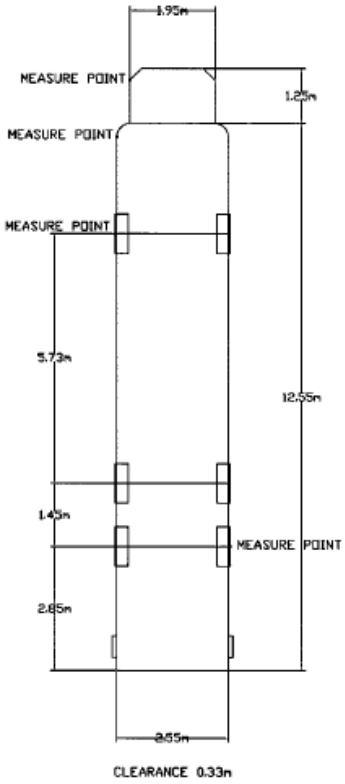
FIRE TRUCK TURNING RADII

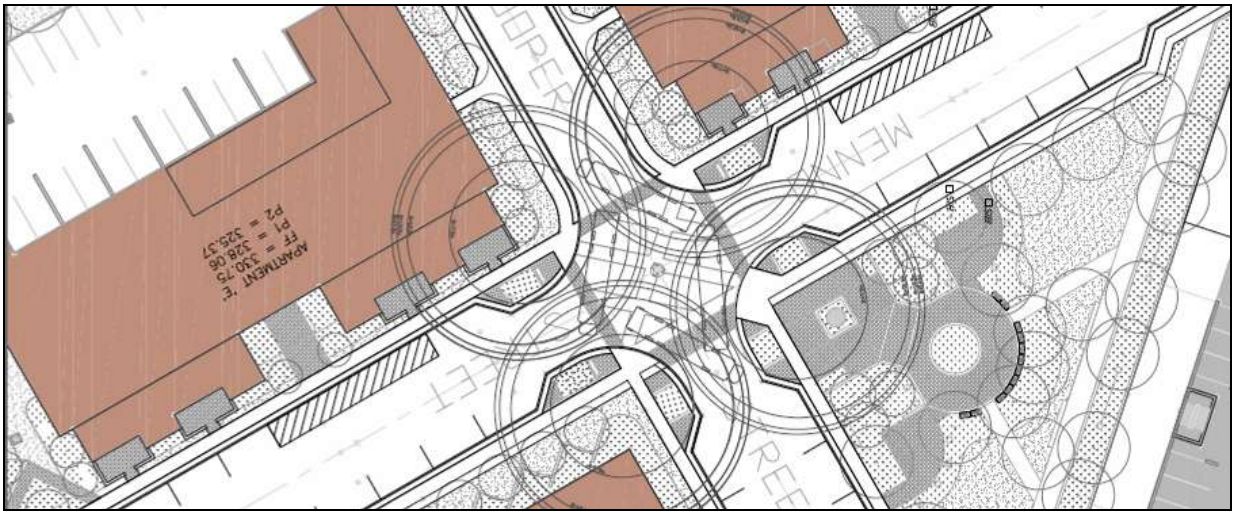
SCALE 1:100



AERIAL TRUCK

SCALE 1:50





Fire Hydrants shall:

- Be clearly identified on the site plan, whether on-street or private.
- Shall be located within 90.0 metres horizontally of any portion of the building permit which is required to face a street.
- Be positioned not closer than 12m to any building face where possible.
- Be installed in compliance with the requirements of the Region of Waterloo.
- Be located in an area unobstructed by landscaping.
- Upon completion of project, the installing contractor shall certify in writing to the Fire Prevention that the hydrant(s) have been tested and left fully operational.

Standpipe and sprinkler Siamese connections fire protection checklist

- Standpipes and sprinkler Siamese connections shall:
    - Be located in accordance with the current Ontario Building Code and shall be identified on the site plan. Show location of off-site fire hydrants.
    - Be located within 45m of a fire hydrants;
    - Be located and access adjacent to a street or fire access route.
    - Be located in an area unobstructed by landscaping.

Tall Buildings:

- Confirm design and construction of underground parking structures to accommodate fire routes and fire fighting weight loads.
- Encourage sprinklered systems for high rise buildings.

Contact Chief Fire Prevention Officer for further information. All information to be confirmed by Chief Prevention Officer and Building Standards staff.

F: BIKE PARKING

- ***Reference:*** *Refer to Zoning Bylaw 2018-050 Section 6.6 Bicycle Parking Spaces regulations.*

The City of Waterloo has a highly interconnected open space system established through on-street bike lanes, major City and Regional trails and the City's multi-use trail program. The City is experiencing greater demand for bicycle parking, particularly given its large student population and expanding hi-tech sector. With more intensification, the City of Waterloo supports non-vehicular modes of transportation and will apply the following bicycle guidelines to development projects based on the following criteria and principles:

- Provide outdoor bike storage for all projects;
- Cluster near building entrances and distribute across large sites;
- Encourage sheltered bike storage areas in central locations near primary or secondary building entrances;
- Encourage indoor bike storage (and indoor shower rooms), particularly for higher density residential projects and employment uses;
- Provide locations that avoid conflicts with pedestrian movement, circulation and be well lit; and,
- Basic standards: ring and post rack with following dimensions:

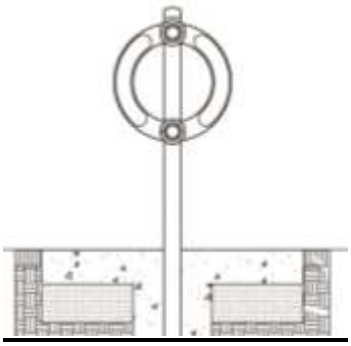
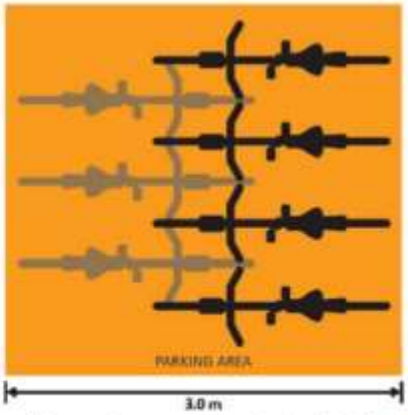


TABLE 6F: BICYCLE PARKING SPACE DIMENSIONS		
	Dimension	
Horizontal BICYCLE PARKING Space	Width (minimum)	0.6 metres
	Length – Single Side Rack (minimum)	2.0 metres
	Length – Double Side Rack (minimum)	3.0 metres
	Vertical Clearance (minimum)	2.0 metres
	Access Aisle Width (minimum)	1.75 metres
Vertical Mounted BICYCLE PARKING Space	Width (minimum)	0.6 metres
	Length (minimum)	1.25 metres
	Vertical Clearance (minimum)	2.0 metres
	Access Aisle Width (minimum)	1.75 metres



(Source: Transport Canada, April 2010)

G: TREE PRESERVATION

Process:

- Show all tree preservation measures on landscape plan for SPRC approval including vegetation on or adjacent properties.
- Complete site visit with City of Waterloo Forester prior to Site Plan Approval. Show tree preservation measures on Landscape Plan and confirm date of meeting on final Landscape Plan submission for approval.
- Install protective fencing prior to and maintain during site construction.
- Examine potential impacts to surrounding properties and provide adequate tree protection measures to avoid damage to vegetation located on surrounding properties.
- Where required, City Forester will make final decision on the tree protection requirements on the job site.

Basic Standards

- Provide tree and vegetation protection barriers for roots, trunk and branches to the drip line prior to and during site development.
- Develop sites to avoid impacts to existing or proposed vegetation and landscaping. Trenchless replacement, torpedo or similar methods must be used where location of existing trees conflict with the proposed location of sewers and services.
- Minimize grades changes surrounding existing trees and vegetation.
- Locate access routes or construction routes away from protected areas.
- All tree protection fencing shall be 1.0 past the drip line of a single or clumps of trees. Buffer provided to protect root zone and minimize compaction impacts.
- All areas within tree protection fencing shall remain undisturbed and shall not be used for storage of building material, equipment, infill or stockpiling.
- All fencing to be approved by City Fosterer. Special fencing may be required adjacent to Environmentally Sensitive Policy Areas (ESPA).
- Avoid cutting surface roots. In excavation, if roots cuts are required, it should be done quickly with smooth flush cuts inspected by City Forester. Cut root areas to be quickly backfilled and watered. Remove branch spending future dieback.

Financial Responsibility:

- No trees shall be cut or removed without the written permission of City Forester.
- Owner is responsible to prune or replace any damaged trees or vegetation on site.
- Owner is responsible for any impacts, damage, remediation and replacement to existing vegetation located on-site and abutting properties. Tree replacement shall be to satisfaction of the City.

Reference: Protective Measures for Tree During Construction (provided in UDM Appendix section)

H: LANDSCAPE & BUFFERS

The City of Waterloo has established the following standards for:

i. Preferred Tree Species
ii. Perimeter Landscaping
iii. Landscape Buffers and Swale Detail
iv. Fence details
v. Habitable Room Separation Requirements

i. Preferred Tree Species

- Native plant species are required for all site development.
- Avoid invasive plant species or species with high susceptibility to disease (such as Norway maple and Austrian pine).
- Select species based on site conditions including shade, salt tolerance, soil conditions (compaction, pH and moisture), mature size and form. Preferred street tree species identified below.
- Alterative, or non-native species, may be considered subject to:
  - Accent or design purposes
  - Salt or shade tolerance
  - Approval of City Landscape Architect, City Forester or General Manager of Development Services.

Preferred Shrub Species

Key	Name (Latin, Common)	Salt Tolerance	Native	Shade Tolerance	Drought Tolerance	Mature Size (m) (height by width)
Asp	*Amelanchier sp.*, serviceberry sp.	M	Some sp.	Part Sun	M	1.75-10 x 2-5
Cs	*Cornus sp.*, dogwood sp.	S	Some sp.	Shade (some)	S	1-8 x 1-8
Hk	*Hypericum kalmianum*, pot'o'gold	T	Yes	Part Sun	M	0.6 x 0.6
Iv	*Ilex verticillata*, winterberry	T	Yes	Part Sun	S	2 x 2
Mp	*Myrica pensylvanica*, bayberry	T	Yes	Part Sun	T	2 x 2
Po	*Physocarpus opulifolius*, ninebark	S	Yes	Part Sun	T	2 x 2
Rs	*Rhus sp.*, sumac sp.	M	Some sp.	Part Sun	T	1-3 x 2-4
Ra	*Ribes alpinum*, alpine currant	M	No	Shade	T	1.5 x 1.5
Sa	*Symphocarpos albus*, snowberry	T	Yes	Shade	T	1.5 x 1.2
Vs	*Viburnum sp.*, viburnum sp.	M	Some sp.	Shade	M	1.5-3 x 1.5-3

Preferred Street Tree Species

Species Code	Name (Latin,Common)	Salt Tolerance	Native	Shade Tolerance	Mature Size (m, height by width)	Form
Ac	Amelanchier canadensis, Serviceberry	T	Y	T	8x3	O
Aca	Acer Campestre, Hedge Maple		N		10x10	R
Ag	Acer Ginnala, Amur Maple		N		7x7	R
Ar	Acer Rubrum, Red Maple	S	Y	I	17x15	O
As	Acer Saccharum, Sugar Maple	S	Y	T	20x15	O
At	Acer Tataricum, Tatarian Maple		N			
Cc	Corylus Colurna, Turkish hazel		N		15x8	P
Co	Celtis Occidentalis, Common hackberry	T	Y	M	20x18	R
Fa	Fraxinus Americana, White Ash	T	Y	T	21x20	O
Faap	Fraxinus Americana Autumn Maple, Autumn Maple Ash	T	Y	T	16X10	O
Fam	Fraxinus Americana Manitou, Manitou Ash	T	Y	T	15x10	O
Fn	Fraxinus Nigra, Black Ash		Y	S	15x10	O
Gb	Ginko Biloba, Ginko	M		S	17x11	I,P
Gv	Gleditisia Triacanthos, Honeylocust	T	Y	S	15x13	P
Lt	Libiodendron Tulipifera, Tulip Tree	S	Y	M	25x15	P
Pyv	Pyrus Var, Pears		N		13x7	P
Qa	Quercus Alba, White Oak	T	Y	M	20x20	P,R
Qb	Querus Bicolour, Swamp Oak		N		15x15	R
Qm	Quercus Macroparpa, Bur Oak	T,M	Y		18x13	O
Qr	Quercus Robur, English Oak	T	N	S	18x13	R
Qrf	Quercus Robur Fastigiata, English Pyramidal Oak	T	N	S	15x5	F
Qru	Quercus Borealis (rubra), Red Oak	T	Y	T	16x15	R
Saf	Sorbus Aucuparia Fastigiata, Pyramidial European Mountain Ash		N		11x2	
Stf	Sorbus Thuringiaca Fasttigiata, Oakleaf Mountain Ash		N		7x3	
Stv	Sorbus Americana, Mountain Ash	M	Y		10x6	
Ta	Tilia Americana, Basswood	M,S	Y		25x13	
Po	Populu Tremuloides, Trembling Aspen		N			
Pa	Plantanus Occidentalis, Sycamore	S	N	M	35x20	

ii. Perimeter Landscaping

- Standard deciduous tree spacing: 6.0-10m intervals with average of 7.5m on centre interval spacing
- Minimum deciduous specifications: minimum 70mm caliper street trees with trunk clear of branches to 1.5m height
- Pyramidal/oval form tree spacing: 5-6 m on center interval spacing.
- Deciduous tree specifications: minimum 5m intervals and minimum 2.5-3.0 height
- Larger trees may be required to implement wind analysis and buffering
- Minimum shrub planting: minimum 60cm height and/or 3.0 gallon volume.
- Hedges: minimum 1.0m on centre intervals with minimum 1.5m height. Maximum 1.0m height along pedestrian routes.

iii. Buffers and Swales

Principles:

- Provide adequate plant material to screen headlamp glare.
- Provide year round buffer. Include all-season plant materials. Encourage small grouping of coniferous trees and all season shrubs.
- Encourage native, drought-resistant and salt-resistant species.
- Provide enhanced landscape treatment in public view. Include shrub planting. Encourage decorative screening walls.
- Ensure that trees do not interfere with existing trees on adjacent properties.
- Measure buffer from mutual property line.
- Maintain buffers for landscaping and screening purposes. Locate site functions including utility equipment and structures, outside landscape buffer area. Minor adjustment can be considered provided integrity of buffer maintained.
- Screen parking areas/lamps from public view(s), sidewalk and residential properties without obstructing pedestrian view.

Intent:

- Maximize landscaped along site perimeter with plant materials such as a mix of coniferous and deciduous trees and shrubs native to Waterloo Region that are drought and salt tolerant, and will provide appropriate screening while allowing for necessary safety and views.
- Landscape buffer typically range between 1.5-4m pending land use relationships. Increased buffers are provided adjacent to low-rise neighbourhoods.

Buffer standards:

- Review Zoning By-law. Varies by By-law.
- Typical residential side yard buffer: typically 1.5m buffer.
- Residential rear yards: typically 3m buffer.
- MR 25 side yard buffer(s): 10m buffer width with at least 3m on one side.

Residential Setbacks and Buffers Standards:

Zoning Requirements (review zoning by-law for current regulations)

Zone	Setback	Buffer (sideyard)	Rear Yard Buffer
MR 4	Minimum side yard is 1.2m plus 0.6 m for every storey above first storey.	No low rise on either side, minimum 1.5m buffer on each side. Abutting low rise, require 3m buffer.	3 minimum
MR-6	Minimum 3m sideyard setback.	No low rise on either side, minimum 1.5m buffer on each side. Abutting low rise, require 3m buffer.	3 minimum
MR 8,12,25	10m combination sideward setback with minimum 3m sideyard setback. Abutting low rise, require 7.5m setback or ½ height of building whichever is more restrictive.	No low rise on either side, minimum 1.5m buffer on each side. Abutting low rise, require 3m buffer.	3 minimum

Commercial Buffers

- Any commercial zone located outside Uptown Commercial Core: minimum 1.5 m side yard buffer, minimum 3.0 m front yard buffer and minimum 3.0m rear yard. Minor reductions may be considered on a site-by-site basis for commercial properties.
- Any commercial zone (and yard) located outside Uptown Commercial Core abutting residential property: 4.0 m standard buffer.
- Any commercial zone located within Uptown Commercial Core: urban landscape treatment subject to city approval and Uptown Design Guidelines.

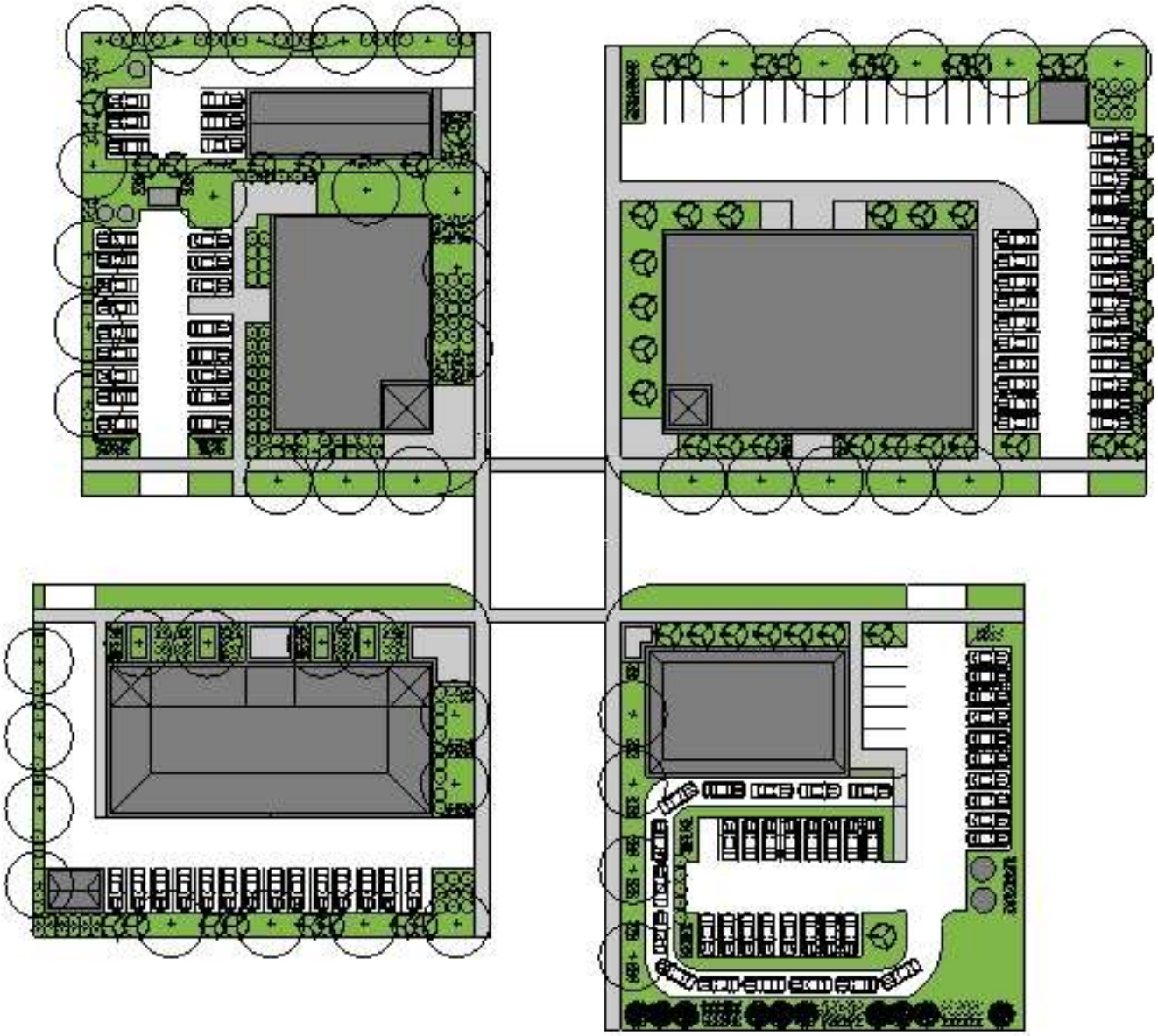
Industrial Buffers

- Any front yard located in North land Business District: minimum 10 m front yard landscaped strip with minimum 1.5 m side yard landscape strip. 10 m front yard may be reduced to 6m provided enhanced level of front yard landscaping is provided to satisfaction of City.
- Any industrial zone abutting a residential property: minimum 4 m landscape buffer unless subject to site-specific by-law or guidelines.
- Any other industrial zone front yard setback: 5.0 m landscape strip with minimum 1.5 m side yard and minimum 3.0 m rear yard landscape stip.

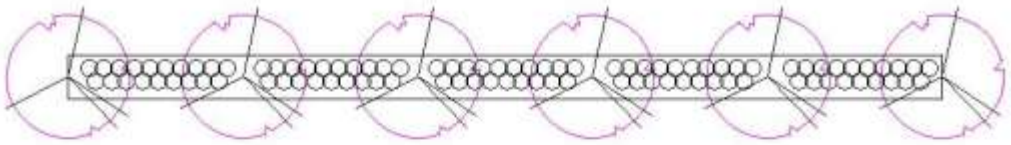
Parking Areas:

- The minimum landscaped buffer for a parking area located adjacent to a public street, sidewalk, any residential property, or any sensitive use, excluding development located in the Uptown Commercial Core, shall be 3.0 metres. Reduced buffers may be considered in the Uptown Commercial Core subject to providing an alternative landscape treatment to the satisfaction of the City.

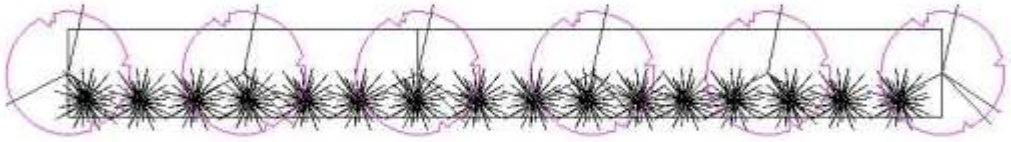
Typical landscape strips/buffers for medium density residential development and residential/non-residential landscape development interface:



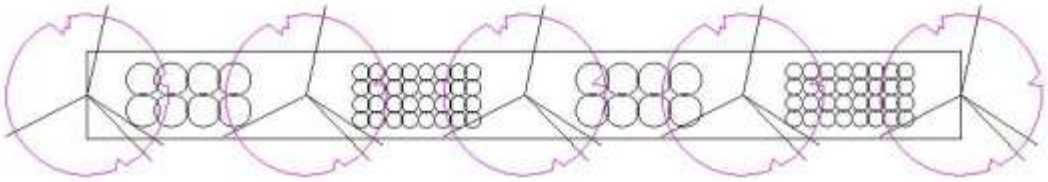
Basic buffer standards:



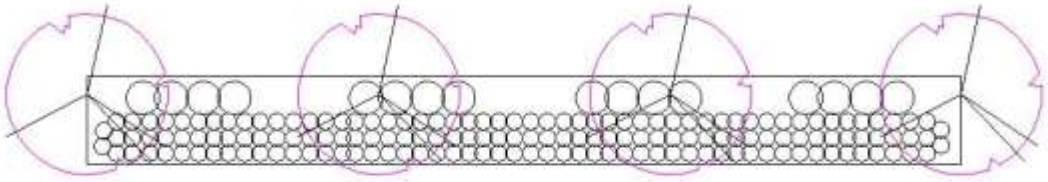
Standard
1.5m buffer



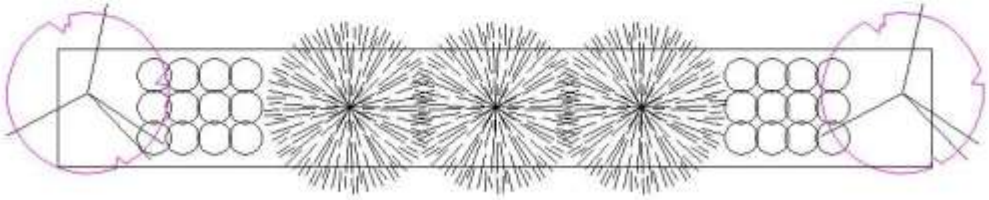
Standard
3 buffer @ 6m intervals
w/ columnar trees



Standard
3m buffer @ 7.5m intervals
w/ larger canopy trees

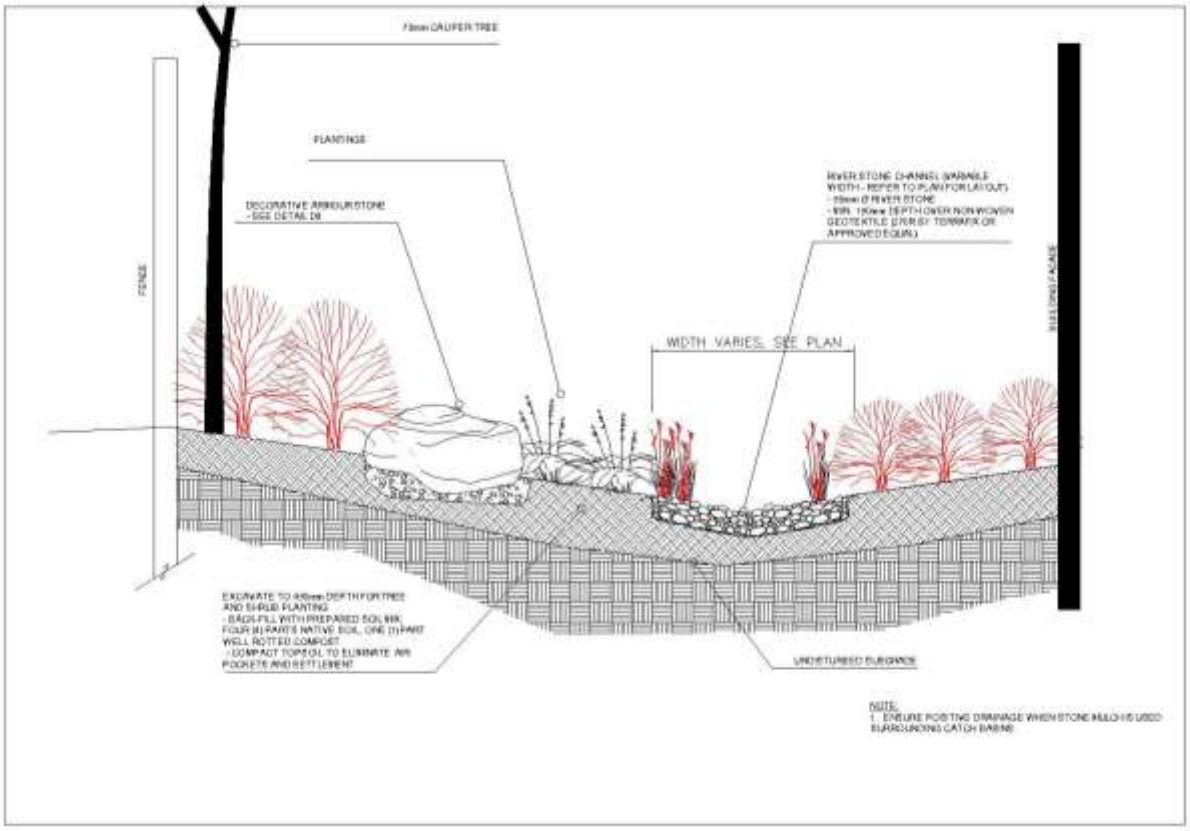


3m swale



Enhanced 4.0m buffer
with 5m conifererous tree intervals
and decidious tree mix

Basic 3.0 m landscaped swale cross section:



iv. Fencing Details

Requirements:

- Fencing is subject to the City of Waterloo Fence By-law regulations.
- Fencing shall not be located in daylight corners.
- Noise attenuation is implemented through the Regional Municipality of Waterloo. Noise attenuation fencing may be required for noise mitigation purpose as part of site plan approval particularly for loading areas located adjacent to residential properties. Provide high quality, durable fence treatment. Stone or masonry fencing preferred.

Principles:

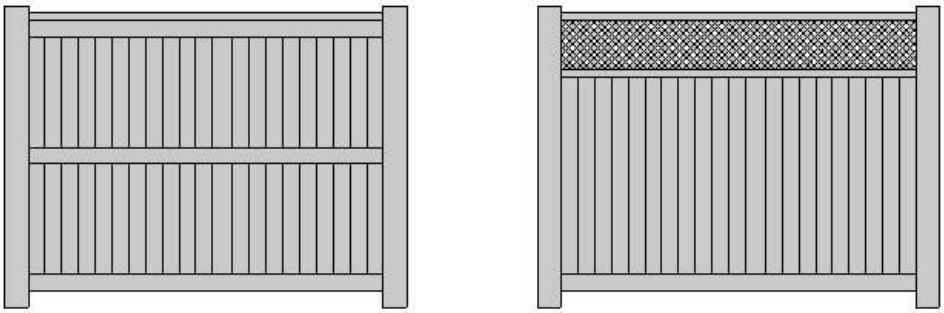
- Locate good side facing public street or surrounding properties.
- Design fencing to accommodate or withstand snow storage compaction (6"x6" posts).
- Select fence style that complements and improves streetscape quality and character.
- High quality fence styles shall be required for buffering, screening and streetscape purposes.
- Provide higher quality decorative fencing abutting residential properties or in public view.

Fence Standards:

Use	Minimum Standards	Style
Standard Residential (non buffer)	Vertical board on board or vertical board Decorative privacy lattice or decorative top rail	MD2 HD2
Buffer (residential with non-residential use)	Vertical board Decorative privacy lattice or decorative top rail Horizontal support recommend Heavy duty posts (6”x6”)	MD1 MD2 HD1 HD2
Commercial (non buffer)	Vertical board Decorative top rail	MD1
Industrial (non buffer)	Vertical board on board	
Standard post detail	6x6 posts	

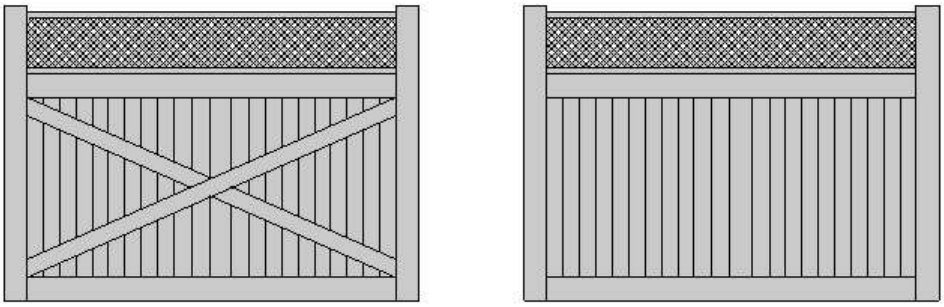
Preferred Fence Types:

Medium Duty:



MD1 **MD2**

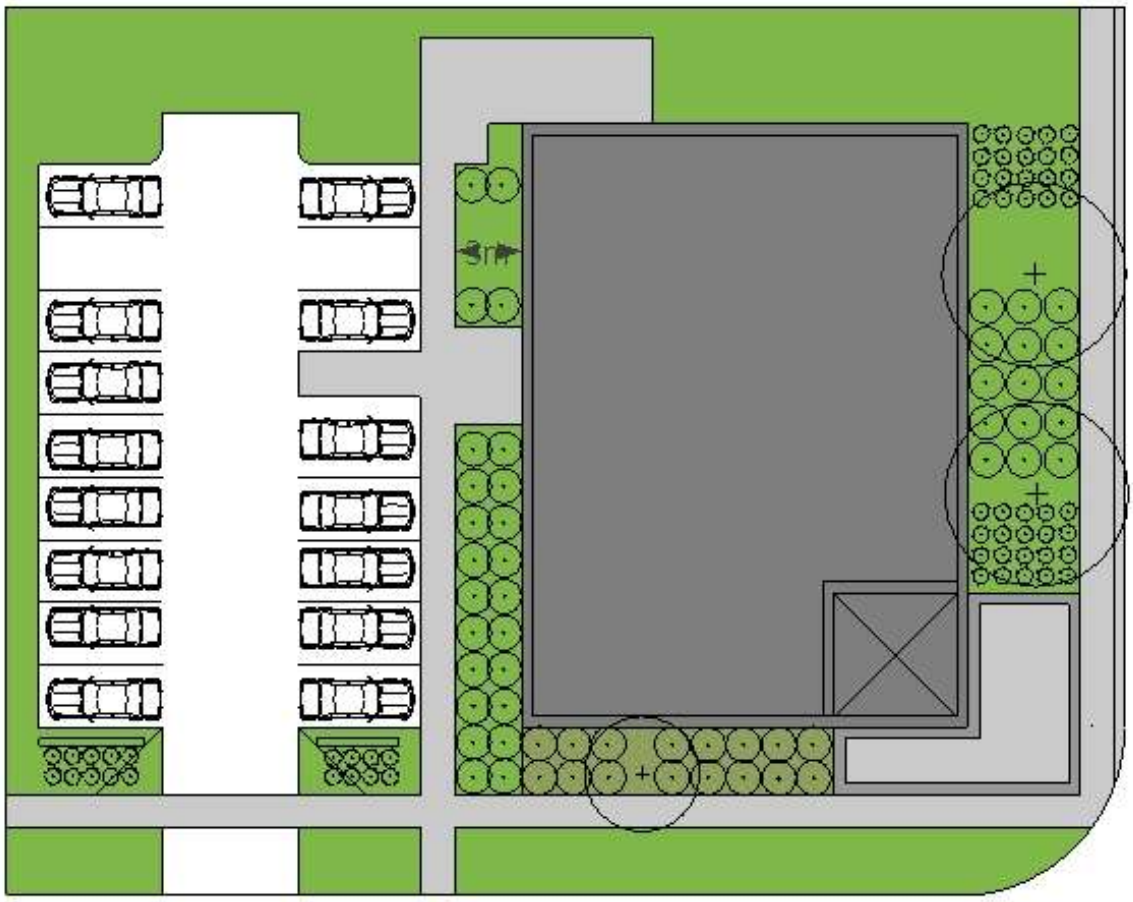
Heavy Duty:



HD1 **HD2**

v. Habitable Room Separation Requirements

- Minimum 8.0m separation space in front of a *principle living room* window. This may be reduced to 3.0 if a 1.0m vertical screen is provided with intensive landscaping treatment.
- Provide a minimum 5.0m separation space in front of *habitable room windows*. This may be reduced to 3.0m where a 1.0m vertical screen is provided with intensive landscaping treatment.
- Provide a minimum 8.0m separation space in front of a *principle living room or habitable space* with a 1.0m vertical screen *if window sill is less than 0.5m above grade*.
- A separation space is not required if the principle living or habitable space is more than 2.0m above grade.



Site plan showing minimum 3m landscape buffer between parking space and habitable room/principle living room window.

I: WATERLOO NORTH HYDRO (WNH)

- Transformer Location: internal side or rear yard. Fully accessible with no obstructions. Discouraged within front yard and flankage yards.
- Consult WNH for technical requirements.

Waterloo North Hydro Inc.
Engineering Department

TECHNICAL GUIDELINES FOR ELECTRICAL SERVICES OVER 400 AMPERES

526 Country Squire Road
Waterloo ON, N2J 4G8
Tel: 519-888-5552
Fax: 519-886-7049
eclerk@wnhydro.com

1.0 GENERAL

1.1 Contact WNH's Engineering Department prior to starting design to determine specific servicing requirements and service configuration type.

1.2 Customer to follow WNH specified design timelines and document submission requirements as per the WNH *"Service Connection Process for Property Developments Requiring Site Plan Review"* document.

1.3 All materials, labour and trucking costs associated with the installation, relocation, removal, etc. of WNH-owned infrastructure for the purpose of the Service is 100% chargeable to the Customer.

1.4 In most cases, WNH will provide and own transformer(s) and high voltage cables and the Customer will provide the transformer pad and underground duct bank. Refer to Appendix for installation details.

1.5 WNH may require multiple transformers and/or high voltage duct banks and/or switchgear on the property to provide a looped configuration of the Service. This will minimize power outages and aid scheduled maintenance.

2.0 TYPICAL INFRASTRUCTURE REQUIRED

A typical electrical service may be composed of any number of the following:

1. underground high voltage duct bank(s), from a point of supply/supplies to the transformer(s) and/or switchgear unit(s);
2. pad-mounted transformer(s) located on the Customer's property, or vault room in the building containing transformers;
3. padmounted or submersible switchgear unit(s) located on Customer's property, or vault room in the building containing switchgear unit(s);
4. an underground low voltage duct bank from the pad-mounted transformer(s) to the building(s);
5. an electrical room in the building containing low voltage distribution and metering equipment.

3.0 EASEMENT REQUIREMENTS

3.1 WNH requires easements for WNH owned high voltage infrastructure on private property. The easements are to be free of any structures, other underground utilities, tree roots, etc. The Customer shall provide easement(s) per the following:

1. 3.0m wide easement over an underground high-voltage duct bank;
2. 6.2m x 6.8m easement for the installation of a pad-mounted transformer;
3. 7.0m x 7.0m easement for the installation of a switchgear unit.

4.0 CLEARANCE REQUIREMENTS

4.1 A building, or any other structure, shall not be constructed within 5 meters, measured horizontally, of an overhead distribution system pole line owned by WNH (OBC 3.1.19 and OESC 75-708). When planning building construction, Customer should consider additional space required for construction (i.e. skyjacks, scaffolding, etc.), and maintenance (i.e. window cleaning).

4.2 An object (crane, similar hoisting device, backhoe, power shovel or other vehicle or equipment) shall not be brought closer than 3 meters to an energized overhead conductor owned by WNH (O.Reg 213/91 – Section 188).

4.3 WNH will not provide nor permit a third party contractor to cover-up and/or provide isolation of its energized overhead conductors that lie along a construction site (O.Reg 213/91 – Section 189).

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5.0 SPACE REQUIREMENTS

5.1 A minimum of 3 meters in front of a pad-mounted transformer and/or switchgear unit is required free and clear of any obstructions for operational purposes. This area shall have a level surface (grass, concrete, asphalt). If a curb runs through this area, it shall be dropped unless it is within 2 meters of the transformer and/or switchgear unit.

5.2 A minimum of 1 meter in front of WNH-owned metering equipment with a minimum ceiling height of 2.1m is required for working space inside the electrical room. Refer to '*WNH Metering Specifications*' for additional requirements.

5.3 Where adequate land area cannot be provided for a pad-mounted transformer, the Customer shall provide WNH with an electrical equipment vault room at grade level accessible directly from outside. Refer to 'WNH Vault Room Standards' for requirements.

5.4 The Customer shall provide WNH with a maintained road that is minimum 4.0m wide, with a minimum 12m turning radius, clear of any obstructions and capable of sustaining a maximum load of 25,000 kg to access the transformer(s), switchgear unit(s) or vault room. A canopy or other parts of the building above the access driveway must be minimum 5.0m above roadway. An 8.5m wide space is required for truck outriggers at the transformer location. Furthermore, extra 2.5m is required between the transformer and the truck to accommodate minimum swing of the truck mounted crane.

6.0 ACCESS REQUIREMENTS

6.1 The Customer must provide or arrange free, safe and unobstructed access to any authorized representative of WNH for the purpose of WNH equipment maintenance, inspection, replacement etc.

6.2 The Customer shall be responsible for supplying WNH a key for the premises if required to access WNH owned equipment. WNH may request that the lock be keyed to WNH specifications.

6.3 Meter rooms, for multi-unit metering, shall be accessible to WNH via an outside lockable door at grade level. The minimum door dimensions shall be 2000mm x 810mm (6'8" x 2'8"). The Customer shall be responsible for supplying a key to WNH. Lighting levels of at least 6 lux (65 footcandles) shall be maintained.

7.0 INSTALLATION DETAILS

The Customer shall provide the required infrastructure in a location compliant with this document and approved by WNH, installed as per the following standards:

7.1 Transformer Installations:

1. Refer to WNH Standard 12-300A1 for the Brooklin Concrete Products Ltd. BCP-104SW transformer vault;
2. Refer to WNH Standard 12-300A2 for the Brooklin Concrete Products Ltd. BCP-104SW transformer vault grounding installation requirements;

7.2 Vault Room Installations:

1. Refer to 'WNH Standards 12-350A1 to 12-350A4 for installation requirements.

7.3 Switchgear Unit Installations:

1. Refer to WNH Standard 12-311A10 for Acton Precast Vista switchgear vault installation requirements.
2. Refer to WNH Standard 12-311A11 for Acton Precast Vista switchgear vault grounding installation requirements.
3. Refer to WNH Standard 12-311A12 for steel framing for switchgear vault installation requirements.
4. Refer to WNH guideline sketches for details on acceptable vault locations and landscaping adjacent to switchgear.

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7.4 Duct Bank Installations:

1. Refer to WNH Standard 12-404A1 for branch duct bank installation requirements (1/0 concentric neutral cable primary duct banks).
2. Refer to WNH Standard 12-404A2 for trunk line duct bank installation requirements (750kcmil concentric neutral primary duct banks).

7.5 Metering Installations:

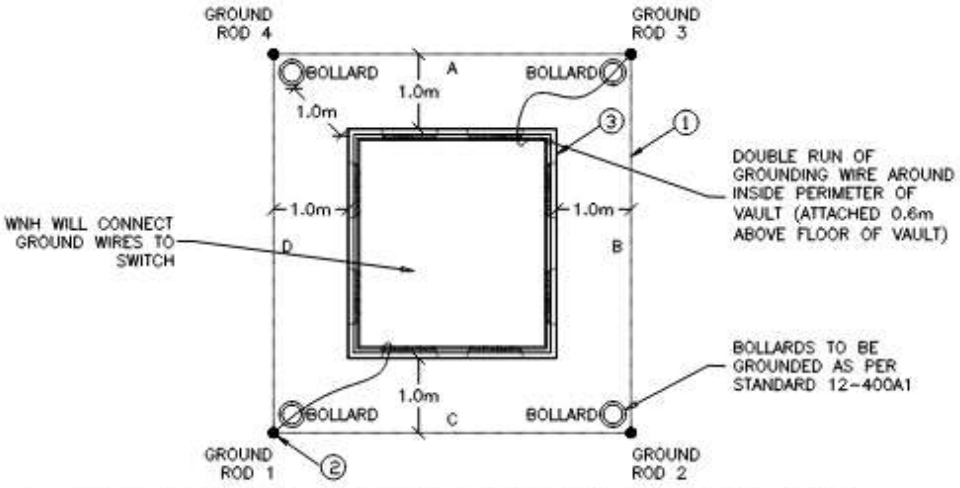
1. Refer to the latest edition of the '*WNH Metering Specifications*' and the site specific metering standards listed in the 'Offer to Connect' documentation for installation requirements.
2. If the site is fed from a customer owned distribution transformer the Customer must make provisions for bulk metering to accommodate a transformer discount meter. Refer to the latest edition of the WNH Metering Standard MS-30A found in the '*WNH Metering Specifications*' for further details.

Typical Pad Transformer and Vault Room Specifications:

WATERLOO NORTH HYDRO INC.

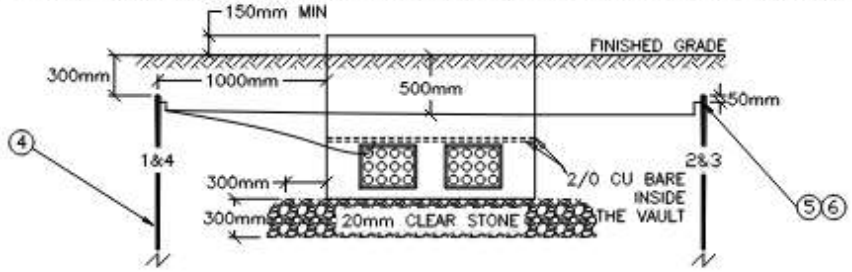
DATE:	SCALE:	REV.	DWG. NO.
2017-04-30	NTS	0	12-311A11

TITLE: ACTON PRECAST 110" X 121" VAULT AND GROUND GRID INSTALLATION DETAIL



BOLLARDS ARE TO BE INSTALLED ONLY IF THEY ARE REQUIRED TO PROTECT WNH EQUIPMENT FROM VEHICLE TRAFFIC. BOLLARD PLACEMENT SHOULD NOT INTERFERE WITH OPERATION, MAINTENANCE OR REPLACEMENT OF WNH EQUIPMENT.

** ADDITIONAL BOLLARDS AT LOCATIONS A, B, C, D MAY BE REQUIRED FOR HIGH TRAFFIC AREAS.



CUSTOMER TO INSTALL GROUNDING GRID PER WNH AND ESA STANDARDS:
ALSO SEE 12-311A6 FOR ADDITIONAL GROUNDING INFORMATION.

1. FEED GROUNDING WIRE FROM INSIDE VAULT THROUGH SPARE PIPE OPENING TO FASTEN TO GROUND ROD #1 WITH AMP TAP.
2. FASTEN GROUNDING WIRE TO GROUND RODS #2, #3 AND #4 WITH AMP TAPS MAINTAINING 500mm DEPTH FOR GROUNDING WIRE.
3. FASTEN GROUNDING WIRE TO GROUNDING WIRE AT GROUND ROD #1.
4. FEED GROUNDING WIRE FROM INSIDE VAULT THROUGH SPARE PIPE OPENING TO FASTEN TO GROUND ROD #3 WITH AMP TAP.
5. FOR ADDITIONAL VISTA GROUNDING INFORMATION REFER TO STANDARD 12-311A12.
6. INJECT SEALANT INTO THE LIFTING HOLES AND DUCT PENETRATIONS UPON COMPLETION OF THE GROUND WIRE AND CONDUIT INSTALLATION.

*- DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED

REV.	DESCRIPTION	DATE	INITIALS

Certificate of Approval

The installation work covered by this document meets the safety requirements of Section 4 of Regulation 22/04

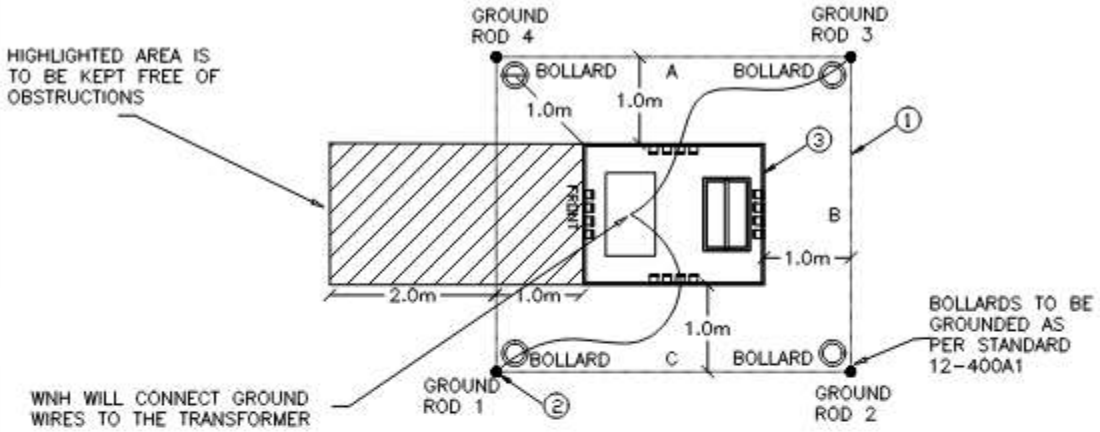
Name _____ Date _____

Signature & Professional Designation _____

WATERLOO NORTH HYDRO INC.

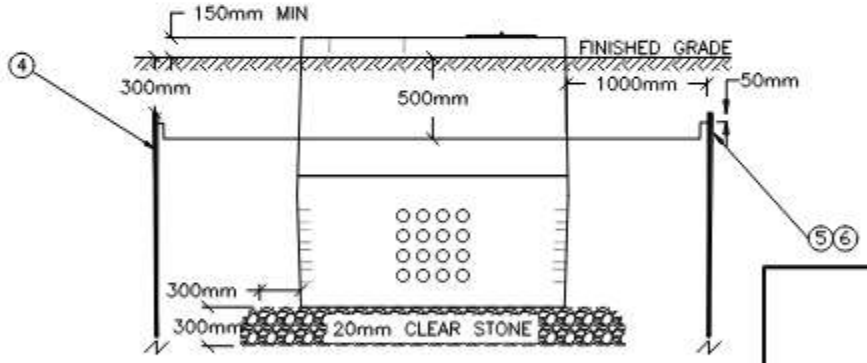
DATE:	SCALE:	REV.	DWG. NO.
2017-04-30	NTS	0	12-300A2

TITLE: **CUSTOM BCP-104S VAULT AND GROUND GRID INSTALLATION DETAILS**



BOLLARDS ARE TO BE INSTALLED ONLY IF THEY ARE REQUIRED TO PROTECT WNH EQUIPMENT FROM VEHICLE TRAFFIC. BOLLARD PLACEMENT SHOULD NOT INTERFERE WITH OPERATION, MAINTENANCE OR REPLACEMENT OF WNH EQUIPMENT.

ADDITIONAL BOLLARDS AT LOCATIONS A, B, C MAY BE REQUIRED FOR HIGH TRAFFIC AREAS



CUSTOMER TO INSTALL GROUNDING GRID PER WNH AND ESA STANDARDS:

1. FEED GROUNDING WIRE FROM INSIDE VAULT THROUGH LIFTING HOLE TO FASTEN TO GROUND ROD #1 WITH AMP TAP.
2. FASTEN GROUNDING WIRE TO GROUND RODS #2, #3 AND #4 WITH AMP TAPS MAINTAINING 500mm DEPTH FOR GROUNDING WIRE.
3. FASTEN GROUNDING WIRE TO GROUNDING WIRE AT GROUND ROD #1.
4. FEED GROUNDING WIRE FROM INSIDE VAULT THROUGH LIFTING HOLE TO FASTEN TO GROUND ROD #3 WITH AMP TAP.

Certificate of Approval

The installation work covered by this document meets the safety requirements of Section 4 of Regulation 22/04

Name _____ Date _____

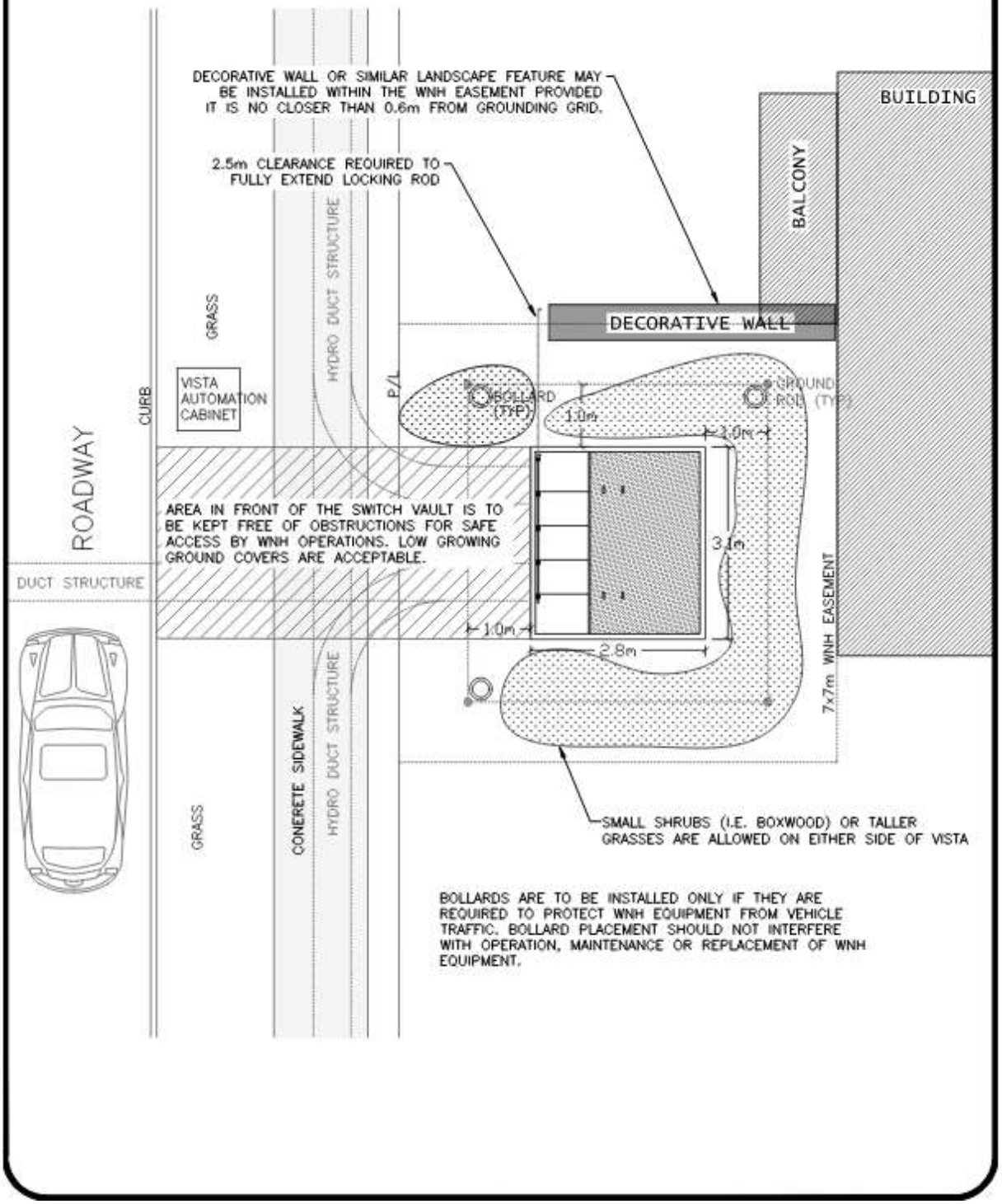
Signature & Professional Designation _____

*– DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED

REV.	DESCRIPTION	DATE	INITIALS

WATERLOO NORTH HYDRO INC.

DATE: 2017-12-19	SCALE: NTS	SKETCH SPG-MB
TITLE: VISTA SWITCHGEAR PLACEMENT GUIDELINE - MID BLOCK OPTION		



WATERLOO NORTH HYDRO INC.

DATE:	SCALE:	REV.	DWG. NO.
2018-07-05	NTS	0	12-350A1

TITLE: **TRANSFORMER VAULT ROOM - CONSTRUCTION DETAILS**

THE CUSTOMER SHALL PROVIDE AT THEIR COST THE ITEMS LISTED BELOW IN COMPLIANCE WITH THE LATEST EDITIONS OF THE NATIONAL BUILDING CODE, ONTARIO BUILDING CODE, ONTARIO ELECTRICAL SAFETY CODE, NFPA80; WATERLOO NORTH HYDRO (WNH) CONDITIONS OF SERVICE AND SITE SPECIFIC REQUIREMENTS LISTED IN WNH'S OFFER TO CONNECT.

1. ACCESSIBILITY:
   - 1.1. ACCESSIBILITY MUST BE AT GRADE ON GROUND FLOOR WITH DIRECT OUTSIDE ACCESS AT ALL HOURS.
   - 1.2. MUST BE ACCESSIBLE BY WNH LINE TRUCKS OVER A HARD SURFACE SUCH AS CONCRETE, ASPHALT, CRUSHED STONE OR OTHER WNH APPROVED MATERIAL.
   - 1.3. THE VAULT ROOM SHALL NOT BE USED FOR STORAGE OR CONTAIN EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION.

2. VAULT WALLS, ROOF AND FLOORS:
   - 2.1. WALLS, ROOF AND FLOORS TO BE REINFORCED CONCRETE WITH MINIMUM OF 0.15m THICKNESS.
   - 2.2. CONCRETE FLOORS SHALL BE LIQUID TIGHT.
   - 2.3. VAULT MUST BE THOROUGHLY CLEANED PRIOR TO INSTALLATION OF GROUNDING AND OTHER WIRING.
   - 2.4. WALLS AND CEILING TO BE BARE CONCRETE OR PARGED FINISHED WITH A LIGHT GREY SURE-TRED RESILCRETE PAINT.
   - 2.5. OIL SUMP PIT MAY BE PROVIDED, CAPABLE OF HOLDING ALL OIL FROM THE LARGEST TRANSFORMER +10%.

3. INCOMING PRIMARY AND SECONDARY DUCTS:
   - 3.1. THE PRIMARY AND SECONDARY SHALL BE LOCATED IN OPPOSITE DIAGONAL CORNERS OF THE VAULT ROOM.
   - 3.2. DUCTS TO BE INSTALLED WITH BELL END FITTINGS FLUSH WITH RAISED ENCASEMENT 0.15m ABOVE FINISHED FLOOR.
   - 3.3. SECONDARY DUCTS OPTION IS ONLY AVAILABLE IN LARGE SIZE VAULT ROOM. THIS OPTION REQUIRES THE CUSTOMER TO PAY FOR MORE EXPENSIVE ELECTRICAL EQUIPMENT TO BE USED IN THE INSTALLATION, ADDITIONAL 11.0m OF SPARE SECONDARY CABLE PER RUN AND CUSTOMER SUPPLIED LUGS.

4. VENTILATION:
   - 4.1. OPENINGS TO BE SIZED ACCORDING TO THE ONTARIO ELECTRICAL SAFETY CODE: 0.002m²/kVA.
   - 4.2. HEIGHT TO WIDTH RATIO MUST NOT EXCEED 3:2.
   - 4.3. THE BOTTOM OF THE AIR INTAKE VENT IS TO BE LOCATED AT A MINIMUM OF 0.45m AND A MAXIMUM OF 1.0m ABOVE OUTSIDE GRADE.
   - 4.4. AIR EXHAUST VENT IS TO BE LOCATED AS CLOSE AS POSSIBLE TO VAULT CEILING.
   - 4.5. IF THE AIR INTAKE AND THE AIR EXHAUST ARE LOCATED ON THE SAME WALL THEY SHALL BE SEPARATED IN DIAGONAL ALIGNMENT ON THE WALL.
   - 4.6. OPENINGS SHALL BE EQUIPPED WITH BACK TO BACK LOUVRES SEPARATED BY A BIRD SCREEN WITH A MINIMUM 1/2" MESH AND HAVE 60mm SPACING.
   - 4.7. ALL MATERIALS TO BE 16 ga. GALVINIZED STEEL.

5. FIRE DOORS:
   - 5.1. TWO CLASS 'A' 3 HOUR RATED FIRE DOORS WITH MIN. DIMENSIONS OF 1.0m x 3.0m PER DOOR.
   - 5.2. DOORS COMPLETE WITH A 10" PAD BOLT CAPABLE OF ACCEPTING A 5/16" PADLOCK, A HASP AND TANG ARRANGEMENT FOR A WNH PADLOCK AND A HEAVY DUTY LOCKING PASSAGE KNOBSET.
   - 5.3. TO PREVENT REMOVAL OF DOORS EXTERNALLY, DOOR PINS ARE TO BE WELDED TO HINGE UNLESS DOOR PINS HAVE SET SCREW LOCKS AND HINGE PLATES THAT ARE CONCEALED OR WELDED.
   - 5.4. A KEY TO CUSTOMER'S LOCK MUST BE PROVIDED TO WNH, AN ADDITIONAL KEY MAY BE REQUESTED WHEN REQUIRED.
   - 5.5. A 100mm CONCRETE DOOR SILL WITH IS A LIQUID BARRIER IN BOTH DIRECTIONS MUST BE PROVIDED.

6. FIRE PROTECTION AND ALARM:
   - 6.1. 3 HOUR FIRE RATED CONSTRUCTION IS REQUIRED OF ALL VAULTS, INCLUDING AIRWAYS.
   - 6.2. A CEILING MOUNTED SMOKE DETECTOR ACTUATE THE BUILDING FIRE ALARM SYSTEM IN CASE OF A FIRE.

7. GROUNDING:
   - 7.1. SUPPLY AND INSTALL FOUR 3/4" x 10' GROUND RODS IN THE FOUR CORNERS OF THE VAULT ROOM, PROTRUDING NO MORE THAN 300mm ABOVE GRADE.
   - 7.2. CONNECT DOORS AND LOUVRES TO THE GROUND LOOP USING #2/0 EXTRA FLEX STRANDED COPPER FOR THE DOORS AND MIN. #4 STRANDED COPPER FOR THE LOUVRES.

8. ACCESSORIES:
   - 8.1. SUPPLY, INSTALL AND WIRE TWO LIGHT SOCKETS AND A 15A RECEPTACLE. SOCKETS ARE NOT TO BE INSTALLED DIRECTLY ABOVE TRANSFORMERS.
   - 8.2. SUPPLY AND INSTALL PULLING EYES CAPABLE OF SUPPORTING 2500KG IN THE CEILING AT A POINT 0.6m FROM VAULT WALL, CENTERED ON THE DOORWAY AND ROTATED TOWARDS PRIMARY DUCTS.

Certificate of Approval

The Installation work covered by this document meets the safety requirements of Section 4 of Regulation 22/04

Date

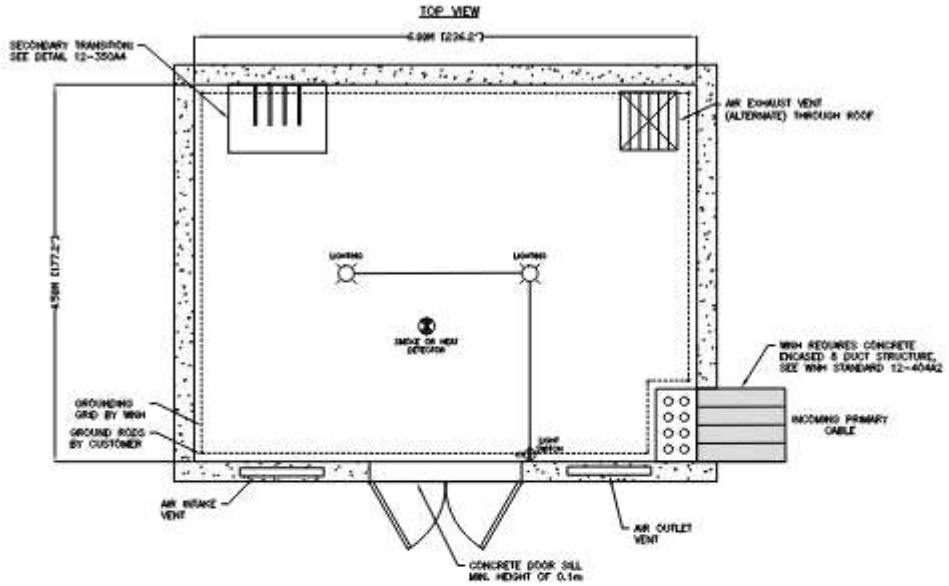
Signature & Professional Designation

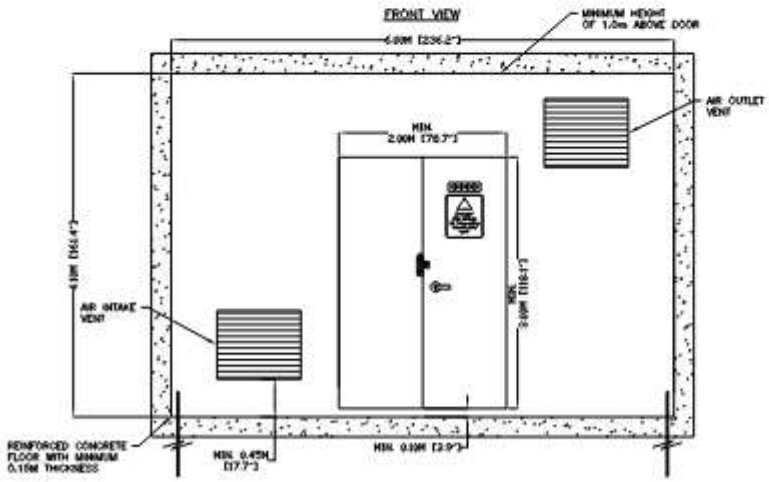
REV.	DESCRIPTION	DATE	INITIALS

WATERLOO NORTH HYDRO INC.

DATE:	SCALE:	REV.	DWG. NO.
2018-07-05	NTS	0	12-350A2

TITLE: TRANSFORMER VAULT ROOM - LAYOUT (TRANSFORMERS UP TO 300kVA)





*- DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED

REV.	DESCRIPTION	DATE	INITIALS

Certificate of Approval

The Installation work covered by this document meets the safety requirements of Section 4 of Regulation 22/04

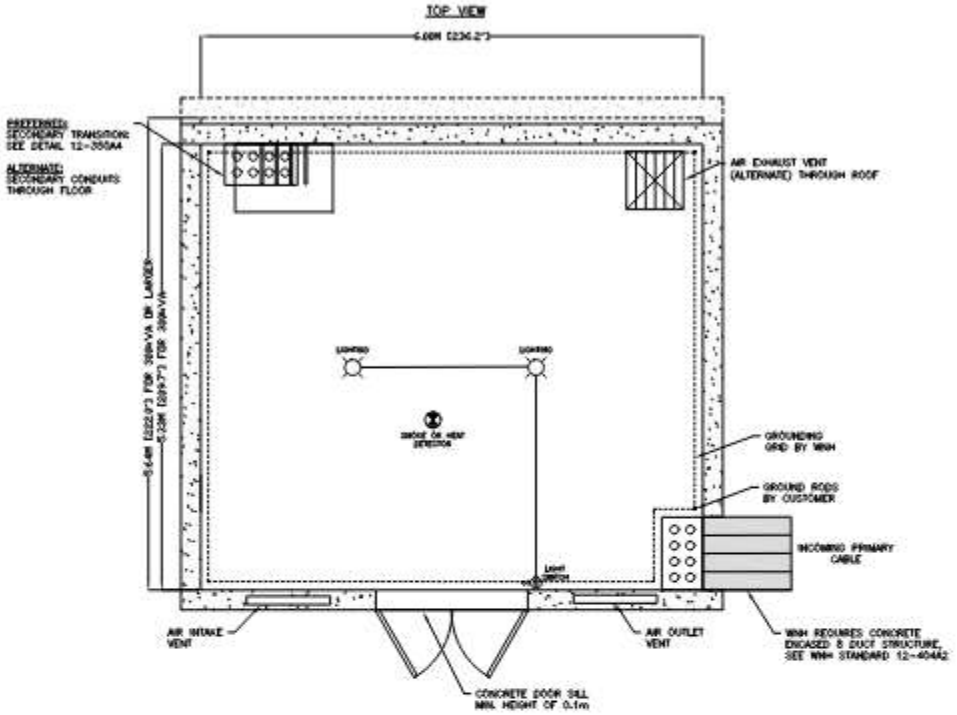
Date

Signature & Professional Designation

WATERLOO NORTH HYDRO INC.

DATE:	SCALE:	REV.	DWG. NO.
2018-07-05	NTS	0	12-350A3

TITLE: TRANSFORMER VAULT ROOM - LAYOUT
(TRANSFORMERS GREATER THAN 300kVA)



*- DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED

REV.	DESCRIPTION	DATE	INITIALS

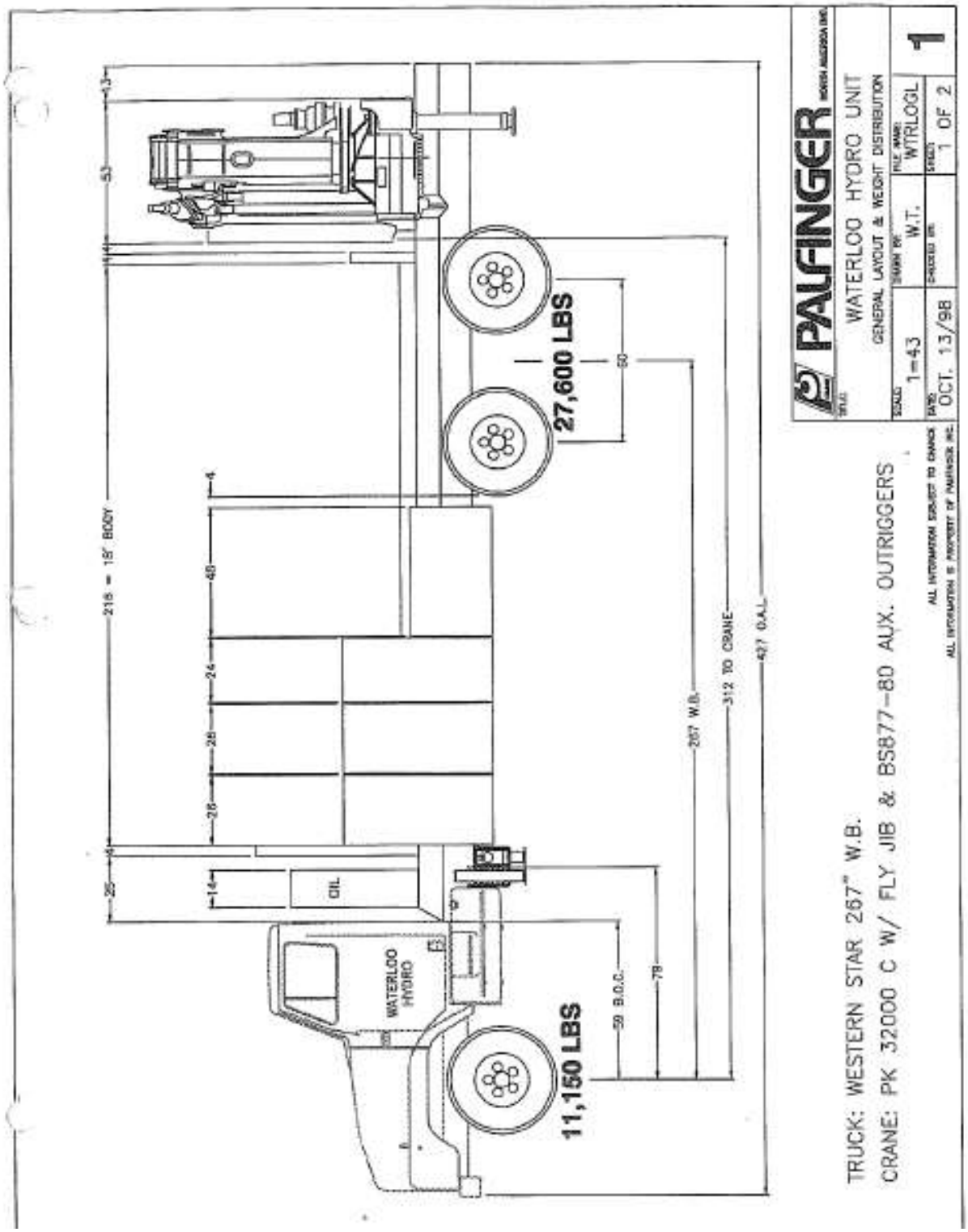
Certificate of Approval

The Installation work covered by this document meets the safety requirements of Section 4 of Regulation 22/04

Date

Signature & Professional Designation

Typical Service Vehicle Dimensions:



J: OUTDOOR LIGHTING CRITERIA

The City of Waterloo will require a photometric plan to evaluate illumination impacts on the site and surrounding properties (in foot candles). All site lighting shall be designed to provide for consistent light levels on the property, avoid glare and be architecturally integrated into the site development based on established standards noted below.

Principles:

- Provide uniform lighting levels (illumination) across the site. Avoid pockets of very high or low levels of illumination.
- Avoid light spill over onto surrounding properties. Average light level shall not exceed 0.1 foot candles on adjacent properties including road way. Light spill over shall not impact the roadway or surrounding residential properties.
- Avoid glare from public view or surrounding residential properties. Provide full cut off light fixtures, or alternative deflection shields, to eliminate glare. Show light fixture on elevation plans.
- Encourage metal halide or other white light fixtures to improve visibility.
- Consider opportunities for LED lighting/technologies for reduced energy consumption.
- Lighting fixtures should complement the design of the development. Encourage decorative style fixtures that architecturally complement the building design.

Example of full cut off light fixture

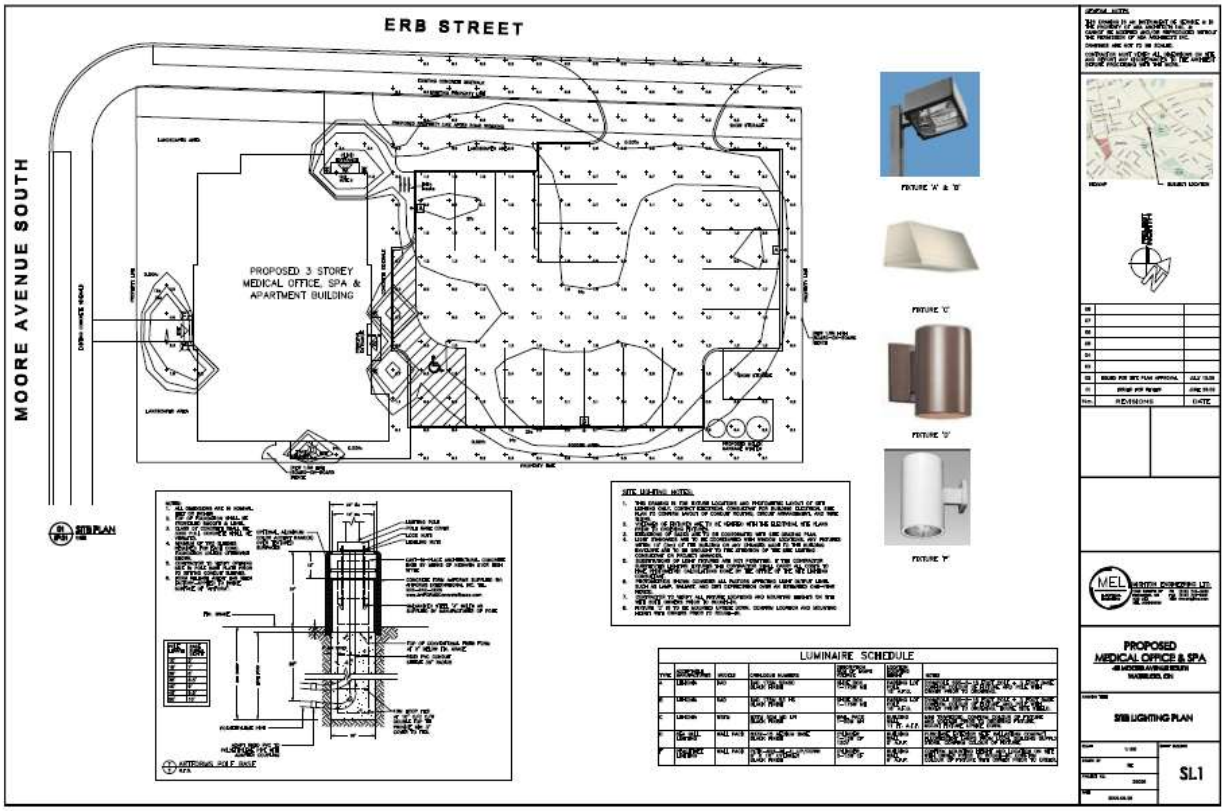
Cut off deflection shield offer an architecturally enhanced alternative

Lighting Standards:

- Average commercial illumination levels (parking areas): 2.0 footcandle.
- Average industrial illumination levels (parking areas): 2.0 footcandle.
- Average residential illumination levels (parking areas) or abutting development: 1.0.
- Average sidewalk/walkway illumination levels: 2.0 foot candle (22 lumens per sm).
- Average building entrance illumination level: 3-5 foot candles (maximum 54 lumen per square metre).
- Average stairway/ramp illumination levels: 3-5 foot-candles (maximum 54 lumen per square metre).
- Maximum gas station illumination levels: 5-8 foot candles.

- Maximum wattage for residential development: 70 watts (suggested by Waterloo North Hydro).

Illustrative lighting plan for 48 Moore Street South:



K: SHADOW STUDY CRITERIA

To evaluate the impact of intensification, the City of Waterloo may require a Shadow Study to illustrate the shadow impact the proposed development has on the site and surrounding properties with emphasis on residential uses, outdoor amenity spaces and park spaces, and to provide recommendations to reduce shadowing based on City criteria. At the discretion of the City, a Shadow Study may be required for development over 6 storeys (18m) height. The Shadow Study requirement will be identified through the pre-consultation process for the following types of applications:

- Official Plan applications
- Zone Change applications
- Site Plan applications
- Minor Variance applications

Ideal times to measure the impact of sun and shadow occur during the equinox, the beginning of spring and fall (around March 21 and September 21) and the summer solstice, the beginning of summer in the northern hemisphere. During the equinox, the sun shines directly on the equator and the length of day and night are nearly equal in all parts of the world. Another important time to consider is during the summer, a time when people generally use their amenity space or public space the most. Based on this, the City of Waterloo shall require shadow tests for the following dates and times:

Date(s)	Times
• Spring shadows, March 21 (equinox):	10am, 12 pm, 2 pm, 4 pm, 6 pm
• Summer shadows, June 21 (solstice):	10am, 12 pm, 2 pm, 4 pm, 6 pm
• Autumn shadows, September 21 (equinox):	10am, 12 pm, 2 pm, 4 pm, 6 pm
• Winter shadows, December 21 (solstice)	10 am, 12 pm, 2 pm

These times allow for measuring of hours of sunlight intervals. Additional times may be requested to respond to specific site conditions and shading concerns. The level of impact is measured by the time of shadow, or duration. To be considered compatible, a Shadow Study must demonstrate:

- As a principle, at least 50% or more of any property should not be shaded for more than two interval times (a four hour equivalency); or,
- As a principle, at least 50% of any property should be in full sun for at least two interval times (a four hour equivalency).

These criteria are similar to other municipal shadow study requirements in the Province. The study should include a summary letter describing how the proposed development meets minimum shadow criteria. If the proposal does not meet the general Shadow Study criteria, the Shadow Study must identify other massing options that would meet the intent of shadow criteria.

The study model is to include the site (highlighted on the plan), as well as, surrounding streets, blocks, parks and all buildings located within the shadow impact boundary during the requested times. Where possible, the model should include other approved but not built buildings within

the model area. The City of Waterloo will provide this information. The shadow model is to be plotted in colour to a standard metric scale.

L: NODES AND CORRIDOR STANDARDS

Supplemental Design Guidelines have been prepared for the Nodes and Corridor Areas. The City has prepared a series of technical design standards to distinguish development expectations for development located in Minor and Major Nodes and Minor and Major Corridor Areas (identified in Appendix Section). These standards provide subtle variation between the two planned areas and should be considered in all site plan development. In cases of potential conflicts, the City's Zoning By-Law and any other applicable legislation shall prevail.

NODAL DEVELOPMENT MATRIX (Major and Minor Nodes)

	Low Rise	*Mid to High Rise*
Building Close to Street	Encouraged, maintain urban street enclosure	Yes with opportunity for landscape setback
Building at Street Corner:		
Primary Node	Yes	Yes
Major Nodes	Yes	Yes
Minor Nodes	Yes	Yes
Build To Zone	Varies	3-10m*
Primary Node Build To Zone***	0-5m	0-5m
Major Nodes Build to Zone	3-7.5	Provide wider landscaped setback for taller buildings
Minor Node Build to Zone	Maintain an urban street enclosure. Greater setback relief provided for non-residential use(s).	Maintain an urban street enclosure. Orient buildings close to street.
Minimum Street Façade Length/Lot Frontage Ratio for residential**	60	60
Minimum Street Façade Length/Lot Frontage Ratio for non residential (commercial)	35-50%	50%
Landscape Buffers	Yes	Yes
Parking in Interior side or rear yard	Varies	Yes
Primary Node	Yes	
Major Nodes	Encouraged	Yes
Minor Nodes	Encourage	Yes
Driveway in front of edge building	Varies	No.
Primary Node	No	
Major Nodes	Limited to two-row parking for commercial use	No.
Minor Nodes	Limited to two-row parking for commercial use	No.

*Minimum and maximum setbacks established in zoning by-law.
**Where lot frontage is less than 25m, this recommendation may be addressed on a site specific basis.
***refer to supplemental, district corridor guidelines.

CORRIDOR DEVELOPMENT MATRIX (Major and Minor Corridors)

	Low Rise	*Mid to High Rise*
Building Close to Street	Encouraged, maintain urban street enclosure	Yes with opportunity for landscape setback
Building at Street Corner:		
Major Corridors	Yes	Yes
Minor Corridors	Yes	Yes
Build To Zone	3-7.5m for residential, greater for commercial***	3-10m*
Major Corridor Build to Zone	Encourage reduced setbacks for low to mid rise buildings.	Provide wider landscaped setback for taller buildings
Minor Corridor Build to Zone	Maintain an urban street enclosure.	Maintain an urban street enclosure.
Minimum Street Façade Length/Lot Frontage Ratio for residential**	60	60
Minimum Street Façade Length/Lot Frontage Ratio for non residential (commercial)	35-50%	50%
Landscape Buffers	Yes	Yes
Parking in Interior side or rear yard	Varies	Yes
Major Corridors	Encouraged	Yes
Minor Corridors	Encouraged	Yes
Driveway in front of edge building	Permitted for commercial.	No.
Major Corridors	Limit to two-row parking	No.
Minor Corridors	Limited to two-row parking.	No.

*Minimum and maximum setbacks established in Zoning By-law.
**Where lot frontage is less than 25m, this recommendation may be addressed on a site specific basis.
***Maximum 23m setback from property line to accommodate landscaping and two-row parking.