PART 5.
UDM APPENDICES

This Part of the UDM Appendices provides supporting background for the UDM such as a glossary of terms for reference, an illustrated glossary, and technical process requirements and standards for the site plan process. The UDM appendices include the following:

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Overtime, the Appendices may be updated by City staff.
A. UDM SUMMARY – AT A GLANCE

CITY OF WATERLOO
URBAN DESIGN MANUAL

The City of Waterloo is committed to promoting a high standard of urban design for all development in the City. The City's primary design expectations are established in the City of Waterloo's Official Plan and implemented through the Urban Design Manual.

WHAT IS URBAN DESIGN?
Urban design is a term that describes an evolving discipline focused on the design and analysis of the city and its related parts and elements. Good urban design is about creating city building and the art of creating great places, places for people. The role of urban design is expanding in city planning and is providing an effective tool in creative city building, intensification and placemaking.
Urban design provides a design-based approach to city planning and a medium to improve the quality of city streets, neighbourhoods and community. It can also be further linked to other initiatives such as the Official Plan, recreation programs and visions and excercises such as the Uptown Vision 2025, to create truly vibrant and dynamic places.

WHAT IS THE URBAN DESIGN MANUAL?
The Urban Design Manual is a consolidated set of City design guidelines and reference material approved by Council that implements the City’s Urban Design policies contained in the Official Plan. This Manual includes General City Design Guidelines for many types of development in the City and includes more detailed Supplemental Design Guidelines for specific types of projects and locations in the city. The Urban Design Manual also includes process guidelines and technical criteria to assist with the Site Plan Review and Approval process.

WHAT ARE DESIGN GUIDELINES?
Design guidelines are a set of design recommendations intended to guide development to achieve a desired level of prescribed quality. Guidelines apply to projects in the public and private realm. They may be general statements, or more technical statements that help create functional, attractive and compatible site development. The City will implement design guidelines with a level of present flexibility through creative and innovative solutions that meet the City’s design objectives.

WHAT ARE THE CITY’S PRIMARY DESIGN OBJECTIVES?
The City of Waterloo has a clear design vision for the City based on the following design objectives:
- Promote a High Standard of Urban Design;
- Respect Context and Promote Sense of Place;
- Enhance Connectivity and Interaction;
- Promote Creativity and Innovation; and
- Encourage Sustainable Design.

These design objectives are established in the City’s Official Plan and have been incorporated into the Urban Design Manual with supporting design guidelines.
WHAT IS THE PRIMARY FUNCTION OF THE URBAN DESIGN MANUAL?
- To support the implementation of the City's Urban Design policies established in the City's Official Plan;
- To provide guidelines to assist with implementing the Planning Act reforms that expanded Site Plan Control to include detailed building design considerations, sustainable design and accessibility;
- To support intensification in planned growth areas through effective guidelines;
- To finalize guidelines for the Nodes and Corridors areas and;
- To establish clear Site Plan review process with supporting standards for site development.

WHAT IMPACT DOES THIS MANUAL HAVE ON FUTURE DEVELOPMENTS IN WATERLOO?
The Urban Design Manual was prepared to apply to many types of development in the City will emphasis on the Site Plan Review process administered through Section 41 of the Planning Act. All Site Plan development is subject to the General Guidelines contained in the Urban Design Manual. In addition, specific types of projects, such as tall buildings or specific locations, such as the Nodes and Corridors Areas, are subject to Supplemental Design Guidelines. All Site Plan developments will be subject to this process and to the criteria established in the Site Plan Review Guidelines (SPRG).

SITE PLAN DEVELOPMENT EXAMPLES:
- Mixed Use Development
  Regina Street
- Commercial Development
  Wildcraft Restaurant
- Institutional Development
  Perimeter Institute
- Office Development
  Research & Technology Park

The City has passed new Official Plan policies (through Official Plan Amendment 72) that strengthens the role of Urban Design Guidelines in the City; providing greater authority and ability to implement design guidelines. The City of Waterloo will use the Urban Design Manual as a component for development review and approval with emphasis on Site Plan Control, and will update the Urban Design Manual on a regular basis.

IMPORTANT PRINCIPLES:
- Design that results in attractive streetscapes
- More articulated building massing that relates to the surrounding buildings, human-scale dimensions and interesting skylines
- Greater emphasis on building entrance, roofing, screening and building massing
- High quality architectural features, materials and coordinated colors that complement and enhance the neighborhood character or project theme
- Higher quality landscaping treatment that contributes and improves streetscape quality and to effective buffer treatment
- More detailed Nodes and Corridors guidelines with emphasis on built form, pedestrian connectivity, landscaping strategies and public art
- Area-specific guidelines for the Uptown
- Sustainable design and opportunities
- Criteria for shadow impacts, lighting standards and landscape matters

FOR MORE INFORMATION CONTACT:
City Hall Planning Division 519.747.8523 or visit www.waterloo.ca
The Urban Design Manual is available in electronic form on the City's website.
Since 1982, the City of Waterloo has used design guidelines as part of its city planning and development approval processes. Many of these guidelines were approved on an ad-hoc basis providing design direction for select areas in the City, and continue to apply today. In all cases, customers should ask City staff the status of previous design guidelines. Over time, it is expected that older city design guidelines get updated and incorporated into the UDM as current, integrated guidelines. A summary of existing guidelines is provided below:

<table>
<thead>
<tr>
<th>Guideline(s)</th>
<th>Year Approved</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural Guidelines</td>
<td>1982</td>
<td>First set of guidelines in City for Uptown. Updated an incorporated into Supplemental Design Section.</td>
</tr>
<tr>
<td>Site Plan Guidelines</td>
<td></td>
<td>Former site plan guidelines. Replaced with UDM.</td>
</tr>
<tr>
<td>Northfield Business Guidelines</td>
<td></td>
<td>Area-specific guidelines. Applicable. Refer to UDM for site plan standards.</td>
</tr>
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<td>University of Waterloo Research and Technology Park</td>
<td>2002</td>
<td>Area-specific guidelines. Applicable.</td>
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<tr>
<td>Draft Nodes and Corridor Design Guidelines</td>
<td>2006</td>
<td>Height and density policy implementation. Draft guidelines. Integrated into UDM.</td>
</tr>
<tr>
<td>Plan it Waterloo Urban Design Principles</td>
<td>2007</td>
<td>Official plan background study introducing new design principles.</td>
</tr>
<tr>
<td>UDM</td>
<td>2009</td>
<td>Urban design policy implementation. General city design guidelines, supplemental guidelines and technical site plan design guidelines and process requirements.</td>
</tr>
</tbody>
</table>
C. INTENSIFICATION PROJECTS AND PRINCIPLES

Mansion Lofts: Infill Townhouses
Density: 60 UPH or 0.9 FSR
11 units, 1782 sm site

Camelot: Infill stacked townhouses
Density: 70 UPH or 0.6 FSR
50 units, 7,109 sqm (0.71 ha)

Court Yard apartments
Underground Stacked Town Houses

Mid-Rise Building
Density: 100 UPH or 2.3 FSR
8 units, 5 storeys, 0.085ha site, surface and underground parking

Betzner Brownstones: Stacked Apartments
Density: 150 UPH or 1.1 FSR
27 units, 0.18 ha site, surface parking

Water Park Place: Highrise Towers
Density: 188 UPH or 2.1 FSR
287 units, 1.5 ha site, mixed parking

Bauer Lofts: Mixed Use Development
Density: 182 UPH excluding non-residential or 2.1 FSR Residential and 3.3 FSR with all uses
160 units, .88 ha site, underground parking
15 storey slab

345 King North: Student Highrise
Density: 250 UPH or 3.4 FSR excluding parking structure
94 units (372 bedrooms),0.4 ha site, parking deck, 16 storey slab

Queens Arms: Urban Infill
Density: 314 UPH or 2.6 FSR
61 units, .19ha, underground parking, 12 storey slab
These intensification projects emphasize the following principles for site development and design:

- Density is greatly affected by building coverage, lot size and parking. Smaller lots tend to have higher density compared to larger lots. More surface parking results in lower Floor Space Ratio (FSR) density however, may not affect Unit Per Hectare (UPH) density.

- Large sites generate the most number of units however, they may not generate the highest density. Higher densities are observed on small to medium size lots.

- Building height is greatly influenced by building type and massing. High-rise buildings average 6-16 units per floor. Tower buildings (6-10 units per floor) generate less shadow impact than slab buildings (average 12-16 units per floor) however, they require greater height to maintain the same density. Reducing shadow impacts (duration) may result in taller, more slender buildings rather than shorter, more bulky buildings.

- A change in massing, such as terracing and step backs, may result in additional building height to compensate for lost units and to maintain a proportionate building scale.

- UPH density and FSR density are not always directly related; in some cases, higher UPH may result in relatively modest FSR. As well, a relatively high FSR may result in modest UPH particularly if a project includes commercial uses or parking structure space which does not form part of a UPH calculation. FSR includes total building floor area, including above ground (structure) parking space. FSR is a measure of volume compared to people.

- UPH is a residential density calculation. Mixed use buildings, or commercial development, does not affect UPH density. The City has higher density projects (FSR) when commercial development is taken into account.
D. MAPS AND SCHEDULES

- Map 1: Regional Roads Map
- Map 2: Major City Gateways Map
- Map 3: Nodes and Corridors Map
- Map 4: Uptown Urban Growth Centre Boundary
- Map 5: Uptown District Map
MAP 4: UPTOWN DISTRICT MAP

[Image of the Uptown District Map from the City of Waterloo Urban Design Manual]
MAP 5: UPTOWN URBAN GROWTH CENTRE

UPTOWN WATERLOO URBAN GROWTH CENTRE AS DEFINED BY THE PROVINCIAL GROWTH PLAN

WATERLOO URBAN GROWTH CENTRE
E. GLOSSARY OF TERMS

Amenity area: An interior landscaped area which is designed and intended primarily for leisure and recreation of the building occupants.

Angular Plane: A line drawn from the edge of the front or rear property line to define the confines in which to build to protect a neighbour’s right to sun.

Arbor: A light open latticework frame, often used as a shady green shelter.

Architectural Feature: Prominent or significant parts or elements of a building or structure such as cornices, canopies, parapets.

Art: The creation of beautiful or thought-provoking works, e.g. in painting, music or writing. The main purpose of art is to express or stimulate ideas or emotions – something otherwise intangible or invisible. Art is unique and original and can be functional, but not necessary. In contrast, design is the creation of something functional in a skillful or artistic way.

Articulation: The layout of pattern of building elements and architectural detail that gives a building interest and added richness. Typically includes walls, doors, roofs, windows, cornices, belt course and other architectural features.

Balcony: A small outside private space, usually attached to the main volume of a building, similar to but distinct from a terrace.

Bay: A principle compartment or division in the architectural arrangement of a building, typically marked by pilasters in the walls, or by any spatial repetition spatial units that separate it into corresponding proportions.

Bay Window: A window forming a recess in a room and projecting outwards from the wall typically in a rectangular form. Some are supported on corbels or on projecting moldings. An angled bay window protrudes over a wall and is triangular in plan.

Belt Course: A projecting horizontal on the exterior of a building marking the separation between floors or levels. Adapted from Design Review.

Belvedere: A building, architectural feature, or rooftop pavilion from which a vista can be enjoyed.

Buffer: A strip of land established to provide separation between land uses typically as an intensive landscaped area.

Build To Line: Minimum amount of building frontage located along the minimum or maximum building setback line to create an urban street enclosure.

Built Form: The location and massing of buildings along a street.

Building Height To Street Width Ratio: The relationship of building height to street corridor width measured either from building face to building face or from property line (the Right of Way).

Caliper: The measurement of the diameter of a tree trunk.

Canopy: A decorative hood above a niche or entry. Also a covered area that extends from the wall of a building, protecting an enclosure.

Cantilever: A structural member or any other element projecting beyond its supporting wall or column with weights at one end to carry a proportionate weight on the projecting end.
**Carbon Footprint:** A measurement of the total set of greenhouse gas emissions caused directly and indirectly by an individual, organization, event or product (UK Carbon Trust, 2008) typically measured in units of tones of carbon dioxide equivalent.

**Character:** A place, including a street, streetscape or neighbourhood, with its own identity.

**Colonnade:** A covered walkway flanked by rows of columns.

**Cornice:** A molded and projecting horizontal feature that crowns a façade.

**Compact City:** A relatively high density, mixed use city (Burton, 2000).

**Compact Urban Form:** Provincial Places To Grow terminology used to describe a land use pattern that encourages efficient use of land, walkable neighbourhoods, mixed land uses, proximity to transit and reduced need for infrastructure. Compact urban form can include detached and semi-detached houses on small lots as well as townhouses and walk-up apartments, multi-storey commercial developments and apartments or offices above retail.

**Compatibility:** The size and character of a building element relative to other elements around it.

**Complete Community:** Provincial Places To Grow terminology used to describe communities that meet people’s needs for daily living throughout an entire lifetime by providing convenient access to an appropriate mix of jobs, local services, a full range of housing, and community infrastructure including affordable housing, schools, recreation and open space for their residents. Convenient access to public transportation and options for safe, non-motorized travel is also provided.

**Conserved:** Means the identification, protection, use and/or management of cultural heritage and archaeological resources in such a way that their heritage values, attributes and integrity are retained. This may be addressed through a conservation plan or heritage impact assessment.

**Context:** The setting of a site and its adjacent uses and structures and views.

**Courtyard:** A private garden space usually enclosed by dwelling on at least two sides.

**CPTED (Crime Prevention Through Environmental Design):** An approach to planning and development that reduces opportunities for crime.

**Cutoff Lighting:** A light fixture constructed in a manner that all light emitted by the fixture, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire (lamp), is project below the horizontal.

**Daylight Corner:** The space on a corner lot formed by the intersection of the street line to the point on the opposite street line.

**Design Guidelines:** A set of design recommendations intended to guide site development to achieve a desired level of prescribed quality.

**Dormer:** A structure projecting from a sloping roof, usually a vertical window that is placed in a small gable. Common types include: arched dormers; eyebrow dormer; hipped dormer; recessed dormer; shed dormer; wall dormer (dormer whose face is integral with the face of wall below); dormer cheek.

**Drip Line:** The drip line is that line representing the outermost limits of the tree branches. This information is required in instances where preservation is a priority. WSPG.

**Double Hung Window:** A window having two vertically sliding sashes, each closing in a different part of the window. Typically located on a wall return.
**EIFS:** Acronym for External Insulation and Finishing System.

**Elevation:** A drawing showing an external face of a building including all architectural features, materials and colour.

**Equinox:** Occurs twice a year (March 20/21, September 21/22) when the tilt of the earth's axis is inclined neither from nor to the sun, causing the sun to be directly over the earth's equator. During the equinox day and night are approximately equal.

**Exterior Design:** Ontario Planning Act term to describe including without limitation the character, scale, appearance and design features of buildings, and their sustainable design, but only to the extent that it is a matter of exterior design.

**Façade:** Refers to an individual exterior wall of a building and its treatment. WSPG. Typically the main exterior face of a building almost always containing an entrance.

**Façade Setback:** A setback of the upper floors (a terracing effect) from the body or base of the building resulting in an articulated building form.

**False:** Non-functional architectural element, such as false window.

**Fenestration:** The arrangement and design of windows and other openings on a building’s façade (design review).

**Floor Space Ratio (FSR):** A density measurement calculating the total amount of gross building floor area divided by the total site area.

**Focal Point:** A prominent structure, feature or area of interest or activity.

**Footcandle:** The standard used to specify the measured intensity of light.

**Frieze:** An elevated horizontal band or panel that is usually located below the corner, and often decorative with sculpture in low relief. Typically a decorative band located below a crown molding.

**Gable:** The entire triangular end of a wall above the level of the eaves, the top of which conform to the slope of the roof which abuts against it.

**Gateway:** A gateway is a form defining an entrance from one domain to another. A gateway relates to the speed, mode, and reason for the traveler entering. A true gateway is a combination of elements that together, create an experience announcing passage into a new domain. Gateways may range in scale from a prominent city entrance, a prominent neighbourhood entrance or a major site entrance.

**Habitable Room:** Any room or space intended primarily for human occupancy, such as kitchens, living rooms, family rooms, bedrooms, dens and finished recreation rooms etc (SPRG).

**Heritage Resource:** Includes but not necessarily restricted to buildings, structures, artifacts, districts and archeological sites of architectural or historical significance (City of Waterloo Official Plan).

**Human Scale:** The proportional relationship of the physical environment to human dimensions.

**Illuminance (lux):** The luminous flux density at a surface. One lux is equal to one lumen per square metre. One footcandle is equal to one lumen per square foot. One footcandle = 10.76 lux.

**Intensification:** Development or redevelopment of a site in an established neighbourhood at higher density.

**Interfenestration:** The space between the windows in a façade.

**Interlocking:** Forms that are united firmly or joined closely by hooking or dovetailing.
**Landmark:** A building, structure or space which create distinct visual orientation points that provide a sense of location to the observer within the neighbourhood or district.

**Legibility:** The extent to which people can understand the layout of a place and find their way including cues from three dimensional forms and patterns in the landscape.

**Lot:** A parcel of land occupied or to be occupied by one main building, structure or use, with any accessory buildings or uses, and includes all yards, and open spaces required by this by-law. A lot may or may not be the lands shown as a lot on a registered Plan of Subdivision. WSPG.

**Luminance:** The physical measure of stimulus which produces the sensation of luminosity (brightness) in terms of the intensity of the light emitted in a given direction by unit area.

**Massing:** The overall form/composition (including bulk, size, shape, height) of a building above grade.

**Master Plan:** A conceptual design for long-term development or a planning document with supporting design guidelines prepared to guide the future development on a site or area.

**Modulation:** A stepping back or projecting forward of sections of a structure’s façade with specified intervals or selections of building width and depth, as a means of breaking a building’s apparent bulk.

**Motif:** A part or element repeated in an ornamental design.

**Official Plan:** A planning document adopted by City Council which contains a formal set of objectives, principles and policies, land use maps, concerning the nature, pattern, extent and scheduling of future growth and change within a municipality for a specified period.

**Ontario Planning Act:** Provincial planning legislation governing municipal development approvals processes and requirements.

**Parapet:** A low, protective or decorative wall or railing along the edge of a roof or balcony, terrace and cornices.

**Pavilion:** An open structure or small ornamental building/shelter used as a summer house or accessory of a larger building.

**Pediment:** A low-pitched triangular gable above a facade, or smaller version above the doorway or above a window or an ornamental accent found above entry way and windows.

**Pergola:** A garden structure that consists of an open wooden-framed roof, often latticed and supported by regularly spaced posts or columns covered by climbing plants.

**Permeability:** The variety of routes and views through a site, block, district or neighbourhood.

**Pilaster:** A partial pier or column, often with a based, shaft and capital, that is embedded into a flat wall and projects slightly.

**Podium:** The base of a tall building, typically 2-4 storeys in height.

**Portal:** An entrance, gate, or door to a building or courtyard, often decorated. Used to mark the transition from the public exterior to the private interior space.

**Portico:** A range of columns or arches in front of a building, often merged into the façade including a covered walkway in which one or more sides are open.

**Private Realm:** The parts of the City (whether publicly or privately owned) that are only available to a specific organization of people, where entry and use is regulated and monitored. Typically located on privately owned lands.
**Projection:** Any component, member or part, that juts out from a building.

**Proportion:** The ratio of one part to another, or its relationship to the whole. A comparison of parts as to its size, length, width and depth.

**Public Realm:** The parts of the City (whether publicly or privately owned) that are available, without charge, for everyone to use or see, including streets, squares and parks. Typically City owned lands, or publicly accessible lands secured through easements/rights of ways.

**Return:** The continuation of a molding, projection, cornice or wall, in a different direction usually at right angles.

**Rhythm:** Reference to the regular or harmonious recurrence of lines, shapes, forms or colours, incorporating the concept of repetition as a device to organize forms and spaces in architecture.

**Sash:** Any framework of a window; may be moveable or fixed.

**Sash Bars:** The strips of wood that separate the panes of glass in a window composed of several panes. Also called muntins.

**Scale:** A comparison of one set of dimensions to another set. Urban design is concerned with human scale, the relationship of buildings and urban space to the size of a human being. A human would be used as the measure for the built environment.

**Screen façade:** Non-structural facing assembly used to disguise the form or overall size of a building or to visually screen interior building functions.

**Semi-Public Realm:** The transition zone between the public zone and the private zone, typically extending from the sidewalk to the building entrance and accessible space.

**Sense of Place:** Characteristics that make a place special or unique, often fostering a sense of authentic human attachment and belonging.

**Setback:** The required distance from a street, property line or another structure, within which no building can be located typically established through Zoning By-law definitions and regulations.

**Site Plan:** A plan of the construction site showing the dimensions and contours of the lot and dimensions of the building. The site plan also shows the site features and functions including areas for landscaping, loading, refuse and snow storage.

**Site Plan Control Area:** “A municipal regulation that permits the City to review and approve site development and elevation plans for any form of development within the City of Waterloo”, subject to the provisions of the Ontario Planning Act. Modified. WSPG.

**Skyline:** The artificial horizon that a city’s built form creates or the outline of a group of buildings and structures against the sky.

**Slab:** Refers to a multi-floor building of long rectangular volume typically at least 40m in length.

**Solstice:** Occurs twice a year (June 21, December 22) when the sun is at its greatest distance from the celestial equator. During the summer solstice the North Pole is tilted towards the sun, and it is the longest day of the year; during the winter solstice the South Pole is tilted towards the sun, and it is the shortest day of the year (in the Northern Hemisphere).

**Spandrel panel:** A panel covering the spandrel area between the head of a window on one level and the sill of the window immediately above.
Step-back (upper or lower storey building stepback): Horizontal shifting of building mass towards the centre of the building.

Street Enclosure: An urban built form condition created by the even height and scale of buildings on both sides of the street resulting in a perceived scale of enclosure based on human dimensions. An urban street enclosure generally ranges between a 4:1 to 1:1 building height to street width ratio.

Street Wall: A line of buildings that frames the street.

Streetscape: The combination of physical elements that give character to the street including the roadway, street lights, street trees, street furnishings, sidewalks and building façade treatments.

Style: Architectural vocabulary and appearance.

Tall Building: Any building four storeys or greater in height including mid-rise buildings ranging between 4-11 storeys in height and high-rise building 12 storey or greater in height.

Tower: A tall, free-standing building with a small footprint organized with dwelling unit clusters about a central lobby and vertical access core.

Transit Oriented Design: Design for transit supportive and oriented streetscapes and public spaces.

Transportation Demand Management: Actions or programs designed to reduce or modify the demand for travel to make optimum use of existing and future transportation facilities and services such as ride-sharing, cycling, transit.

Universal Design: The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

Urban Design: A term used to describe a field of study focused on the design and analysis of the city and all its interrelated parts including, but not limited to, neighbourhoods, blocks, site development, exterior building design, spaces between buildings, circulation patterns, the built form.

Urban Heat Island (UHI) Effect: The temperature increase in urban centres or area(s) associated with the replacement of natural vegetation with pavements, buildings, and other structures necessary to accommodate growing populations (modified, Wong, 2005).

Verandah: Similar to a balcony but located on the ground level.

Vista: A line of vision, contained by buildings or landscaping, to a building or other feature which terminates the view.

Walkway: A street level exterior publicly accessible pedestrian way through the middle of a city block or parking area. Or walking area that connects the public sidewalk to the front door of a building.

Wall Dormer: Dormer feature whose face is integral or vertically integrated with the face of the wall below.
<table>
<thead>
<tr>
<th>Box Bay Window</th>
<th>Canopy or Hood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cantilever roof and double hung window (corner window)</td>
<td>Cornice</td>
</tr>
<tr>
<td>Curtain wall system</td>
<td>Façade Modulation</td>
</tr>
<tr>
<td>Pediment</td>
<td>Pilaster (vertical columns or buttress)</td>
</tr>
</tbody>
</table>
G. BASIC ROOF TYPES

- Front Gabled
- Cross Gable
- Hipped
- Pavilion Hipped
- Mansard
- Parapet
H. INTERESTING ROOFLINES

CANTILEVERED ROOF:

FLAT ROOF:

SCULPTED

FLAT ROOF:

STEPPED

STEPPED

MANSARD:
I. TALL BUILDING MASSING

- Perimeter block building (corner building)
- Tower
- Podium Towers
- Podium Point Tower
- Modulated Slab
J. BUILDING ENTRANCE FEATURES

Proportionately Scaled Entrance Features:

Articulated Entrances:
## Recessed Entrances:

### Avoid:
- Fake/Faux Entrance or Entrance Features
- Hidden or fully recessed entrances with obstructed sight lines
- Un-proportionate features/entrances

<table>
<thead>
<tr>
<th>Fake/faux door</th>
<th>Hidden entrance</th>
</tr>
</thead>
<tbody>
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<td></td>
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</tr>
</tbody>
</table>
K. AMENITY SPACES
L. URBAN DESIGN AWARDS CRITERIA

The City of Waterloo supports a high standard of urban design through its Urban Design policies and City urban design guidelines (Urban Design Manual). With these initiatives, the City has (re)instituted its Urban Design Awards (UDA) program starting in 2010 to recognize design excellence and industry leaders on a bi-annual basis.

The purpose of the City of Waterloo Urban Design Awards is to recognize design excellence within the City based on nomination and judging criteria.

Eligibility:
- Nominations may be submitted by all members including property owners, consultants, industry representatives, staff and the general public.
- Eligible projects must have received site plan approval and be constructed prior to the awards submission cut off date subject to a judging committee site visit.

Urban Design Awards:
- **Award of Excellence**: presented to projects that demonstrate overall design excellence for all awards criteria related to high standard of urban design, context and sense of place, connectivity and interaction, creativity and innovation and sustainable design.
- **Award of Merit**: presented to projects that demonstrate design excellence in specific evaluation criteria, feature or type of project also demonstrating a high standard of project design.
- **Award of Distinction**: presented to remaining project finalists that were evaluated by the Judging Committee.

Notification Process:
- Nomination forms provided on City’s website.
- Urban Design Awards ceremony held on a regular basis.
- City will contact site plan applicants prior to award submission deadline.
- City will provide advertisement in the Waterloo Chronicle before submission deadline.
- Awards Presentation: Council televised meeting recommended.

Judging Committee Process:
- The judging process is a two step process involving a staff selection subcommittee to select the urban design award finalists, and, the formal judging committee to evaluate the final projects.
- The Urban Design Awards Subcommittee (the site plan review committee members) is also responsible to prepare and organize the urban design awards program. They will evaluate final projects based on the established evaluation criteria used by the Urban Design Awards Judging Committee. The judging committee will be determined as part of the nomination process.

Evaluation Criteria:
- Evaluation criteria involves weighting rankings based on City of Waterloo Urban Design Objectives and supporting design guidelines:
M. SUSTAINABLE DESIGN CRITERIA

The City of Waterloo supports sustainable design and development practices. This site plan process is one part of a lifecycle which includes site engineering, green building design, landscape design and public realm improvements. Together, these practices represent significant opportunity to integrate sustainable design features some with limited effort, and other features, require greater upfront cost.

Over time, it is anticipated that the upfront costs will be recovered through operating cost savings and higher return value. Applicants should consider, and evaluate, the opportunity to incorporate sustainable design elements which may be eligible to a number of green building design programs such as LEED certification or Green Building Design which are based on credits. The City of Waterloo promotes sustainable design, and supports any initiatives which help reduces the carbon footprint, promotes longer term energy savings and promotes a higher quality of life/liveability.

A summary of select sustainable design features are identified below with corresponding LEED points for information purposes and site planning opportunities:

<table>
<thead>
<tr>
<th>Sustainable Design Element/Features</th>
<th>Examples</th>
<th>Cost</th>
<th>Cost Recovery Potential</th>
<th>Potential LEED Credit</th>
<th>Site Plan Eligible</th>
<th>Site Plan Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative transportation</td>
<td>bike parking, transit facilities</td>
<td>Low/medium</td>
<td>Reduced carbon footprint</td>
<td>✔ ✔ ✔</td>
<td>✔ ✔ ✔</td>
<td></td>
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<tr>
<td>boulevard planting</td>
<td>Low</td>
<td>NA</td>
<td></td>
<td></td>
<td>✔ ✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Water efficient landscaping</td>
<td>native plant materials (SPG 10)</td>
<td>None</td>
<td>High (reduced maintenance)</td>
<td>✔ ✔ ✔</td>
<td>✔ ✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Light pollution reduction</td>
<td>Solar street lighting</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Site Design</td>
<td>Low</td>
<td>NA</td>
<td></td>
<td></td>
<td>✔ ✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Barrier Free Accessibility</td>
<td>Low</td>
<td>NA</td>
<td></td>
<td></td>
<td>✔ ✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Alternative transportation</td>
<td>Outdoor bike storage, indoor bike storage.</td>
<td></td>
<td>Reduced carbon footprint</td>
<td>✔ ✔ ✔</td>
<td></td>
<td></td>
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<tr>
<td>Light pollution reduction</td>
<td>Solar lighting, full cut off luminaries, dark sky compliant lamps, LED luminaires</td>
<td>High</td>
<td></td>
<td>✔ ✔ ✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bioswales</td>
<td>Low</td>
<td>NA</td>
<td></td>
<td></td>
<td>✔ ✔ ✔</td>
<td>Encouraged</td>
</tr>
<tr>
<td>Thermal and Moisture protection</td>
<td>Porus paving</td>
<td>Varies</td>
<td>NA</td>
<td>✔ ✔ ✔</td>
<td>Encouraged</td>
<td></td>
</tr>
<tr>
<td>Sustainable sites</td>
<td>Reduced heat island effect</td>
<td>None</td>
<td>NA</td>
<td>✔ ✔ ✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>quality control measures</td>
<td>Varies</td>
<td></td>
<td></td>
<td>✔ ✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water efficient landscaping</td>
<td>Green roofs, grey water treatment systems, native</td>
<td>Low-medium</td>
<td></td>
<td>✔ Encouraged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Design</td>
<td>plants and seeds,turf and grasses (no mow)</td>
<td>Varies</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>--------</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>water use reduction</td>
<td>Rainwater harvesting systems, rainwater catchment systems, water cistern tanks,</td>
<td>Medium</td>
<td>Low-medium</td>
<td>✓</td>
<td>✓</td>
<td>Encouraged</td>
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<tr>
<td>Thermal and moisture protection</td>
<td>Curtain wall and glazed assemblies, glazing, photovoltaic glazing</td>
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<tr>
<td>energy efficient fixtures</td>
<td>medium</td>
<td>High</td>
<td>✓</td>
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<td></td>
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<tr>
<td>green roofs</td>
<td>Medium</td>
<td>✓</td>
<td>✓</td>
<td>Encouraged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>solar orientation</td>
<td>Low</td>
<td>High</td>
<td>✓</td>
<td>Encouraged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Construction</td>
<td>recycled materials</td>
<td>Low-medium</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local materials</td>
<td>Medium or not always available</td>
<td>✓</td>
<td></td>
<td></td>
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</table>

### LEED SUMMARY

<table>
<thead>
<tr>
<th>Certification:</th>
<th>Level</th>
<th>Points</th>
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<tbody>
<tr>
<td>Certified</td>
<td></td>
<td>26-32 points</td>
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<tr>
<td>Silver</td>
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<td>33-38 points</td>
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<tr>
<td>Gold</td>
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<td>39-51 points</td>
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<tr>
<td>Platinum</td>
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<td>52 or more</td>
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</table>

<table>
<thead>
<tr>
<th>Credit Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Sites</td>
</tr>
<tr>
<td>Water Efficiency</td>
</tr>
<tr>
<td>Energy and Atmosphere</td>
</tr>
<tr>
<td>Materials and Resources</td>
</tr>
<tr>
<td>Indoor Environmental Quality</td>
</tr>
<tr>
<td>Innovation and Design Process</td>
</tr>
</tbody>
</table>
BARRIER FREE ACCESSIBILITY GUIDELINES

- The Barrier Free Accessibility Guidelines apply to all public sector projects.
- The Universal Design Guidelines and Site Plan Standards apply to all private sector projects. The Barrier Free Accessibility Guidelines will be used to augment the UDM guidelines and standards.
- Review and comply with Ontario Building Code requirements and Built Form Legislation.

BARRIER FREE ACCESSIBILITY

DEFINITIONS:
Barrier Free Access: continuous unobstructed access, connecting all elements and spaces of a building or facility. Exterior accessible routes may include parking access aisles, ramps, crosswalks at vehicular ways and barrier free accessible doorways at all entrances and exits.

STANDARDS:
These standards have been developed to ensure that barrier free access is provided for all new developments and redeveloped sites. The Cities of Kitchener and Waterloo are committed to promote and encourage developments that are designed for all users. These guidelines were originally developed by the K-W Barrier Free Advisory Committee, who has provided preferred dimensions based on their personal working experiences.

BASIC PARKING REQUIREMENTS

Quantity

Designated parking spaces for persons with disabilities must be provided within the Industrial, Commercial, Institutional and Residential zones per the ratios outlined in tables 1, 2 and 3.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Industrial (1 per 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Parking Spaces</td>
<td>Required Barrier Free Parking</td>
</tr>
<tr>
<td>1 - 100</td>
<td>1</td>
</tr>
<tr>
<td>101 - 200</td>
<td>2</td>
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<tr>
<td>201 - 300</td>
<td>3</td>
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<tr>
<td>301 - 400</td>
<td>4</td>
</tr>
<tr>
<td>401 - 500</td>
<td>5</td>
</tr>
</tbody>
</table>
BARRIER FREE ACCESSIBILITY

**TABLE 2**
Residential, Commercial and Institutional (2 per 100)

<table>
<thead>
<tr>
<th>Total Parking Spaces</th>
<th>Required Barrier Free Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 50</td>
<td>1</td>
</tr>
<tr>
<td>51 – 100</td>
<td>2</td>
</tr>
<tr>
<td>101 - 150</td>
<td>3</td>
</tr>
<tr>
<td>151 - 200</td>
<td>4</td>
</tr>
<tr>
<td>201 - 300</td>
<td>5</td>
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</tbody>
</table>

**TABLE 3**
Hospital and Medical Centre (5 per 100)

<table>
<thead>
<tr>
<th>Total Parking Spaces</th>
<th>Required Barrier Free Parking</th>
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</thead>
<tbody>
<tr>
<td>1 – 20</td>
<td>1</td>
</tr>
<tr>
<td>21 – 40</td>
<td>2</td>
</tr>
<tr>
<td>41 – 60</td>
<td>3</td>
</tr>
<tr>
<td>61 – 80</td>
<td>4</td>
</tr>
<tr>
<td>81 – 100</td>
<td>5</td>
</tr>
</tbody>
</table>

Size
- A minimum width: 5.2 m
- A minimum length: 5.5 m

Right Angle Parking
- When the parking space is the same elevation as the sidewalk and at a right angle to the parking stall, a minimum size of 3.9 m x 5.5 m is acceptable. Sidewalk is to be a minimum of 1.8 m wide
- Where right angle parking is proposed in multiples of two, the designated parking space may be reduced to 3.9 m

Parallel Parking Spaces
- Parallel parking spaces are to have a minimum length of 6.7 m and minimum width of 3.9 m when adjacent to a flush curb/sidewalk
BARRIER FREE ACCESSIBILITY

DESIGNATED PARKING SPACES

Designated parking spaces shall be provided for use by persons with disabilities in parking lots associated with all public facilities, and in parking areas serving commercial, industrial, institutional, hospital and medical centres and residential developments.

Location
- Locate adjacent to the barrier free entrance(s) of each building and connect with the barrier free path of travel
- Locate with sufficient clearance around vehicles, light standards, waste receptacles, etc.
- Locate away from designated fire routes, intersections, driveways, etc.
- Locate so that persons do not need to travel behind parked cars and/or across a traffic lane where possible
- In mall parking areas, the required number of designated spaces should be appropriately divided to ensure parking at all public entrances to the mall and stores
- In strip plaza parking areas, arrange the designated parking spaces at each end of the plaza and at the centre
- Where there are multiple buildings on a site, the designated parking should be divided amongst all the buildings

Design Criteria
- It is recommended that the entrance nearest the designated parking spaces be equipped with a power door operator
- Locate as close as possible to the passenger elevator and connect with a barrier free path of travel with a maximum of 4% transition (2% preferred) as per Figure 1 and 2
- Provide a level landing area adjacent to entrances with a minimum area of 1.5m x 1.5m
BARRIER FREE ACCESSIBILITY

Figure 1

Pavement
Building Entrance
Parking/Entrance Sign Designated Space (Minimum 3.6m x 1.5m)
Minimum 1.5m x 1.5m level landing area
4% max. (2% preferred)
4% max.
2% max. Cross Slope

Sidewalk
Barrier Curb
Curb Slope
4m
4m
5.2m
1.5m

Flush Curb
Full Width of Parking Space

Sign A
Sign B

Yellow Symbol
Blue Stamped
Spaces
Dividing Lines

Signs (as per Figure 5) A and B to be placed at extreme edges of multiple parking bays

Barrier Free Guidelines
BARRIER FREE ACCESSIBILITY

- Behind all flush curbs a maximum slope of 4%, 2% preferred, with a minimum width of 1.5 m.
- Provide a minimum vertical clearance of 2.75 m (see Figure 3)

![Diagram of barrier free accessibility](image)

Figure 3
Vertical clearance at passenger loading zone

**Surface**

- Provide a barrier free path of travel that is flush with the adjoining sidewalk and marked with bright white lines or made with contrasting materials and colour.
- Provide a level, non-slip, non-glare, textured, hard surface having a slope between 1% and 3%
- Designated parking space(s) are to be painted with the international symbol of accessibility. The symbol shall be painted with a yellow solvent-based traffic paint on a minimum 1.5 m x 1.5 m blue solvent-based traffic paint background
- Landscaping and other design features shall be used to prevent vehicles from protruding over barrier free paths of travel

**Signage**

- Locate designated parking signage 1.2 m above grade, 0.6 – 2.0 m from curb edge, or on a building face within 2.0 m of curb. The sign should be mounted at a height of 1.5m to 2.5m, measured from the top of the curb to the bottom of the sign. Signs mounted on moveable bases are unacceptable.
BARRIER FREE ACCESSIBILITY

- Ensure that signage does not obstruct pedestrian flow of adjacent areas.
- Signage can be obtained through the Transportation Division (519) 741-2371.
- Provide directional signage in large parking areas or for hidden parking spaces (see Figure 4, and 5).

![Figure 4](image)

Sign pointing to designated parking spaces for persons with disabilities.

![Figure 5](image)

Sign Location of Figure 5
Sign Location for Multiple Parking.

Barrier Free Guidelines
BARRIER FREE ACCESSIBILITY

DESIGNATED INTERIOR PARKING SPACE REQUIREMENTS

- Provide at least one parking level with access to the passenger elevator lobby through a door equipped with a power door operator
- Locate as close as possible to the barrier-free accessible elevator
- The entrance to at least one parking level shall have a vertical clearance of not less than 2.1 m in all areas used by wheelchair accessible vehicles. For interior parking spaces which will be used by personal modified vans, a vertical clearance of 2.75 m is preferred (see Figure 3).
- A barrier-free path of travel is to be provided to at least one parking level
- Passenger loading areas (i.e. drop-offs) should be considered at all main barrier-free entrances (see Figure 6 and 7)
BARRIER FREE ACCESSIBILITY

Figure 7
Building Entrance, Drop-off, Parking Examples

Primary location with no vehicular lane crossings
Main building entrance
Level landing area as per Ontario Building Code
2% max. Cross Slope
Max. 4% slope in Accessible Parking Bays
Flush Curb
Max. 4% Slope in Drop-Off Zone
Max. 2% on Landing
Max. 4% Grade
Flush Curb
Drop-off zone with covered canopy
For signs, contact the Traffic & Parking Division (Figure 10)
Typical Multiple Barrier Free parking stall (3.9m x 5.5m)
Typical Single Barrier Free parking stall (5.2m x 5.5m)
"Handicapped Blue" solvent based traffic paint for background.
"Yellow" solvent based traffic paint for symbol.

Barrier Free Guidelines
BARRIER FREE ACCESSIBILITY

PASSENGER LOADING AREA
Pedestrian loading areas (i.e. drop-offs) must be provided at all main barrier-free entrances.

Location
- Locate adjacent to the barrier-free entrance(s) of each building and connect with the barrier-free path of travel
- Ensure passenger loading areas are visible from the main barrier-free entrances so that persons can see and be seen while waiting to be picked up or dropped off
- Locate so that persons do not need to travel behind parked cars and/or across a traffic lane
- Locate away from designated fire routes, intersections, driveways, etc.
- Canopies or other overhead structures over roadways providing access to the entrance shall have a vertical clearance of 2.75 m and allowing for specialized transit usage
- Provide overhead protection (i.e. canopy) at passenger loading areas where possible

Size
- Where a flush grade sidewalk is present, the width of the loading space may be decreased to 3.9 m (see Figure 6). Otherwise, the passenger loading space shall be 5.2 m wide
- A minimum length of 7.0 m
- A minimum vertical clearance of 2.75 m (see Figure 3)

Note: Also see the Ontario Building Code for fire access route design requirements.

Surface
- Provide a level, non-slip, non-glare, textured, hard surface having a slope of between 1% and 3%
BARRIER FREE ACCESSIBILITY

Signage

- Identify passenger loading areas with proper signage so that motorists are not confused with parallel parking spaces
- Provide directional signage in large parking areas or for hidden passenger loading areas (see Figures 4, 5 and 8 for signage)

![Sign Face](image)

Figure 8
Sign indicating parking spaces for persons with disabilities

Rest Areas

- Provide benches and places to the side of pedestrian routes between the passenger loading areas and the main entrance

SIDEWALKS

Sidewalks also refer to walkways and pathways for this document. Sidewalks, curbs and grading are to be designed in a manner that provides maximum assistance for persons with mobility disabilities without creating hazards for persons who are visually impaired.

Ensure that all grading of the barrier-free path of travel does not exceed 4% and that the landing areas adjacent to curbs do not exceed 2% in any direction. All transitional grade changes on sidewalk areas shall be less than 3% wherever possible (see Figure 9).
BARRIER FREE ACCESSIBILITY

The minimum width for a sidewalk is 1.8 m. This allows enough width for two people in wheelchairs to pass and also for the piling of snow along the edges without obstructing pedestrian traffic flows during the winter months.

Location of Curbs
- Install flush curbs within the barrier-free path of travel indicating the direction of pedestrian travel.
BARRIER FREE ACCESSIBILITY

Figure 9
Textured Surface Detail

Plan View
Sidewalk Ramp/Flush Curb

NOTES:
1. Eliminate cross-slope in 2 m Slope Transition Zone wherever the grade is increased to 3% or more.
2. This standard is to be used in all cases of new construction where applicable.

Cross Section
Flush Curb

Detail 1
Sidewalk Ramp/Flush Curb
BARRIER FREE ACCESSIBILITY

- Install flush curbs across the full width of all designated parking spaces for persons with disability and the full width of all passenger-loading areas. (see Figures 1, 2, 6 and 7)

Location

- Provide walkways between all barrier-free entrances, parking and passenger loading areas, municipal sidewalks, and outdoor amenities (i.e. telephone seating areas, playgrounds, parks, etc.)
- Postal boxes, benches, bicycle racks and trash containers must not intrude into walkways

Slope

- Where two sidewalks meet each other, they shall meet at the same grade (i.e. no steps)
- Continuous slope shall be between 0% and 4% with a cross-slope between 1% and 2%
- Eliminate or minimize cross-slope on walkways where the grade is greater than 3%
- Where sidewalks have a slope of 2% to 4%, provide level resting areas every 30 m
- Resting areas are to be a minimum of 1.8 m wide and 2.2 m long
- Slopes greater than 5% must be designed as a ramp with handrails on both side (see Figure 10)

Surface

- Provide non-slip, non-glare surfaces for sidewalks. Do not include exposed aggregates or ridges which allow water or ice accumulation
- Provide textured surface at key locations (sidewalk edges, road intersections) to indicate changes in the path of travel
- Provide poured in place concrete (preferred) or asphalt
- Poured in place concrete sidewalks should have a broom finish which is perpendicular to the path of travel
BARRIER FREE ACCESSIBILITY

RAMPS
In circumstances where there is a grade change of 5% or greater, ramps with handrails are necessary to ensure a barrier-free path of travel.

Location
- Locate ramps as close as possible to the most direct barrier-free path of travel
- Locate ramps in a manner which compliments the overall design of the building and its site

Size
- Ramps shall be a minimum of 1.2 m wide
- Provide a minimum internal clear width of 1.2 m
- Provide a level area at the top and bottom of a ramp of 1.8 m x 1.8 m
- If a door is provided, the landing shall be extended at least .6 m beyond the latch of the door opening
- Provide a minimum vertical clearance of 2.1 m
- Avoid obstacles intruding into ramps (i.e. sandwich board signs, overhanging shrubs/trees, etc.)
BARRIER FREE ACCESSIBILITY

Figure 10
Preferred Ramp and Landing Dimensions
BARRIER FREE ACCESSIBILITY

Slope

• Preferred maximum slope of 6%.
• Provide handrails on both sides of ramps.
• A gradient of 5% or less does not require handrails.
• A handrail is always required at an elevation change of .6 m.
• Provide landings where there is an abrupt change in direction, and at intervals not more than 9 m along the horizontal length of the ramp (see Figure 10).

Refer to handrail requirements for additional information.

Surface

• Provide non-slip, non-glare surfaces. Do not include aggregate or ridges which allow water or ice accumulation.
• Provide poured in place concrete (preferred), asphalt or wood.
• Poured in place concrete ramps should have a broom finish which is perpendicular to the path of travel.
• Maintain the ramp so that it is free of snow, debris and other obstructions.
• Surfaces of ramps that form a barrier-free path of travel shall have no opening that will permit the passage of a sphere more than 13 mm in diameter (see Figure 11) and shall have a slip-resistant, continuous and even surface.
• Provide colour and texture contrast at the top and bottom of ramps.
• Ramps and landings which are not at grade or adjacent to a wall shall have protected edges, possibly combined with the railing design.
BARRIER FREE ACCESSIBILITY

Figure 11

Openings larger than 0.013 m may catch wheelchair wheels or canes and may cause a person to trip.

0.013 m in diameter

Direction of travel

0.013 m

STEPS

In circumstances where there is a change in grade, steps are often necessary.

Location

- Locate steps as close as possible to the most direct barrier-free path of travel
- Locate steps perpendicular to the pedestrian direction of travel
- Locate steps in a manner which compliments the overall design of the building and its site

Size

- Provide a preferred minimum clear width of 1.8 m
- Treads and risers shall have a uniform rise and run throughout a flight of steps. Rise shall be a minimum of 125 mm and a maximum of 200 mm. Run shall be a minimum of 255 mm and a maximum of 355 mm
- Flights of steps should not exceed 1.5 m in height between changes in level without a landing
BARRIER FREE ACCESSIBILITY

- Provide a vertical clearance of 2.1 m

Slope
- A cross-slope of 1% is recommended to ensure that steps are well drained and do not allow icing

Surface
- Provide a level non-slip, non-glare textured, hard surface. Do not include exposed aggregate or ridges which allow water or ice accumulation
- Provide poured in place concrete, which is preferred, wood or concrete pavers. Poured in place concrete steps should have a broom finish which is perpendicular to the path of travel
- Provide colour and texture contrast at the top and bottom of flights of stairs and on stair nosings. (refer to Figure 12). Use a colour/lightness contrasted strip, a maximum of 50 mm deep on the leading edge on the tread and vertical face of the nosing. Steps must be illuminated to a minimum level of 10 foot candles
BARRIER FREE ACCESSIBILITY

Nosing
- Provide contrasting colours on the nosing of steps to assist persons with visual impairments
- Nosing should not project. If a ‘shadow line’ is proposed for decorative purposes, it should not have a height exceeding 12 mm. (refer to Figure 13)
- Provide a ‘nosing’ radius or curvature no more than 13 mm. (refer to Figure 13)

HANDRAILS
Handrails are furnishings which are common to both ramps and stairs.

Location
- Should be provided on both sides of a ramps and stairways

Size
- Provide at a height between 865 mm and 965 mm as measured vertically from a line drawn through the surface of the ramp
- A minimum of 30 mm in diameter and a maximum of 40 mm
- Provide a clearance between every handrail and any wall to which it is fastened. Minimum clearance is 40 mm, preferred 60 mm. (refer to Figure 14)
BARRIER FREE ACCESSIBILITY

- Extend horizontally not less than 300 mm beyond the top and bottom of the ramp or stairway and curve to the wall or post (refer to Figure 15)
- A minimum clearance of 1 m is required between handrails.
- Avoid squared edges. Terminate handrails in a manner which will not obstruct pedestrian travel or create a hazard. (refer to Figure 15 and 16)
- Handrails used by children should have a lower set of handrails with a recommended height of 600 - 700 mm. Where handrails are used extensively by both young users and adults, a double set of handrails is suggested.

Figure 15
Handrail Extensions
BARRIER FREE ACCESSIBILITY

Preferred   Acceptable   Not acceptable

Figure 16
Handrail Slopes

ENTRANCES

Surface
- Provide textured floor surface on both sides of doorways which will alert those with visual impairment

Location
- Locate barrier-free entrances in prominent locations which are easy to find and sheltered from the elements
- Locate barrier-free main entrance adjacent to designated parking space and passenger loading areas
- Grade level fire doors and exits must be accessible and connect directly with accessible exterior, as well as interior circulation routes
- In retrofit situations, at least one accessible entrance, preferably the main entrance, should be provided adjacent to designated parking spaces and/or passenger loading areas

Size
- Door openings should have a minimum clearance width of 915 mm, with the door in the open position (door handles, push bars, etc. must not intrude into the clearance)
BARRIER FREE ACCESSIBILITY

- Thresholds are discouraged. If required, a threshold should be colour/brightness contrasted and be a maximum of 13 mm in height.

ENTRANCE OPERATORS

Automatic Door Activators

- Automatic door activators allow persons with a disability, parents with children, shoppers with full hands and people with strength limitations easy access and exit.

- Motion sensors are the preferred automatic door activators. They should keep the door(s) fully open until the area is cleared (Figure 17).

- Pressure plates should extend beyond the full swing of swinging doors in a manner which does not require persons using wheelchairs or scooters to back up.

- Avoid large expanses of clear and unmarked glass near entrances. Mark glass doors with a colour/brightness contrasted, continuous strip 100 mm wide, 1350 mm from the finished floor.

NOTE: Adjust motion sensor detection zones to suit use. The wide zone is used where there is side traffic. The narrow zone is used for direct approaches or swing doors.

Figure 17
BARRIER FREE ACCESSIBILITY

- Grade level fire doors and exits must be accessible and connect with exterior and interior accessible routes
- Provide transitional illumination between exterior and interior lighting conditions for both day and night use. Avoid any sudden drop in illumination level and sharp contrast in light and shadow
- Doors and door frames should be colour/brightness contrasted from surroundings. Door edges and jambs should not be excessively sharp
- Wherever possible, entranceways should be covered to keep snow, ice and rain off the front entranceway platform
- Push buttons should be placed 750 mm above grade on a wall, post or handrail in a manner, which does not create pedestrian/door conflicts. Push buttons should be positioned to be located by vision or touch and be a minimum of 900 mm in front of the door(s). Push buttons should be large square or round plates, at least 100 mm in diameter, with maximum colour contrast for good visibility
- Where push buttons are used on double (side by side) doors, swinging or sliding, the push buttons must be on the side of travel. In vestibules (two door sets), it is recommended the second door be opened using a time delay. Double sets of openers are difficult to reach and are often confusing.

Automatic Sliding Doors

- Automatic sliding doors which are activated with motion sensors are the preferred option for barrier-free entrances
- Activate automatic sliding doors with a motion sensor, push button or pressure plate. Where there is a double set of doors, a timed delay operator for the second door is preferred
- Allow 15 seconds minimum before closing from an open position
- All automatic doors should be integrated into an emergency backup system
BARRIER FREE ACCESSIBILITY

- Automatic doors should be of lightweight construction and easy to open in the event of a power failure

Automatic Swing Doors

- Activate automatic swing doors with a motion sensor, pressure plate or push button

- Automatic swing doors require guardrails on both sides. Guardrails should have a second rail not more than 680 mm above grade and a rail or kick plate not more than 75 mm above grade (see Figure 18). Guardrails are to be colour contrasted to surrounding area

- Allow 15 seconds minimum before closing from an open position

- Automatic swing doors which have automatic swing door sensing devices also require guard rails. The sensing devices stop and/or slow door movements when there is a pedestrian in the path of the swing door

- All automatic doors should be integrated into emergency backup system

- Automatic doors should be of lightweight construction and easy to open in the event of a power failure

Figure 18
Preferred guards at out-swing
BARRIER FREE ACCESSIBILITY

Signage
- Signage (i.e. international symbol of accessibility for persons with disabilities) must identify all public use accessible doors. It should be placed in a prominent location indoors and outdoors, preferably on both sides of the door(s), at a height of 1.2 m to 1.5 m.
- International symbols should be a minimum of 125 mm in diameter (refer to Appendix A)

AMENITIES
- Amenities are to be constructed so that all users can equally utilize facilities

Waiting and Rest Areas
- Waiting and rest areas should be provided at regular intervals of 90 metres along barrier free paths of travel, as well as at drop off areas, bus stops and telephone booths
- Provide a bench with a minimum length of 1200 mm. Allow for a space 1000 mm wide and 1200 mm deep beside each bench for wheelchair or scooter users (see Figure 19)
- Provide a refuse/recycling receptacle at waiting/rest areas
BARRIER FREE ACCESSIBILITY

Playgrounds

- Playground equipment is now being designed and manufactured to provide barrier-free opportunities which encourage use by all children. As well, new surfacing materials have been developed to provide cushioning abilities and barrier-free travel.

- All playground equipment must be approved by the latest edition of the Canadian Standards Association (CSA).

- Play areas for children in public spaces must be accessible to all children and their parents/care givers. Whereas it may not be possible to have complete accessibility to every item and piece of play equipment in the play area, the play needs of all children must be considered and design of play areas must ensure access for both adults and children in the play area.

- When designing inclusive play areas, careful consideration is to be given to the following:
  - barrier-free access from the street into the play area;
  - availability of rest stations and seating opportunities;

- In addition to the above considerations, city-wide level parks should also include the following:
  - availability of washroom facilities which are accessible to people who use mobility devices (i.e. manual and electric wheelchairs and scooters) for adults and children;
  - availability of accessible shelter from sun and wind; and
  - availability of an accessible water fountain/drinking fountain.

- Avoid tripping edges and raised curbs in water play areas, to allow access by people using mobility devices and use by children and adults with visual impairments. Utilize colour/brightness/contrast.

- Water-flow control devices designed to be controlled or manipulated by children should be placed so that they can be comfortably reached by preschool children and children with disabilities.
BARRIER FREE ACCESSIBILITY

- Gates and doorways are to be a minimum of 920 mm in width and should not occur at corners, turns or congested areas.
- Play area pathways are to have a firm surface, typically asphalt.
- Pathways should be free of joints that may cause tripping or the "washboard" effect on mobility devices such as manual and electric wheelchairs and scooters. Joints should be flush, light and as short as possible.
- Acceptable pathway surfaces that do not soften with heat or moisture include:
  - H1.3 asphalt;
  - concrete; and
  - well-compacted stone dust.
- Consideration to be given to adult care givers who may also be persons with disabilities.

Picnic Areas

- A minimum of 2 or at least 10% of picnic areas within a site must be accessible.
- An accessible approach to the picnic area must be provided from an accessible parking space.
- A hard-surfaced path connecting the parking space to the picnic areas and to other facilities (i.e. washrooms, water etc.) should be provided.
- Picnic sites should be within 30 metres of accessible washroom facilities.
- Accessible picnic tables should be on hard, level, well-drained surfaces. The bottom edge of the table top must be no lower than 680 mm above ground level.
- Appropriate signage is important.
BARRIER FREE ACCESSIBILITY

Paths and Trails

- Trails should be a minimum of 3000 mm wide. Rest areas should be provided along trails at regular intervals.
- Slopes are to be between 0% to 4% wherever possible with a cross-slope between 1% and 2%
- Slopes greater than 5% should be designed as a ramp.
- Where paths and trails are sloped 3% to 5%, provide level resting areas every 30 metres. Resting areas are to be a minimum of 1.8 m wide and 1.8 m long.

Surface

- Provide a hard, stable, non-slip, non-glare surface, which is continuous and even. It is recognized that in natural areas, softer surface materials such as limestone screenings are acceptable. Other acceptable materials include asphalt, concrete and wood decking (boards to be perpendicular to the direction of travel with spacing not exceeding 13 mm).
- Provide colour and texture contrast or a hand rail to define path/trail edges and intersections, changes in direction, building entrances, road intersections and curb ramps.
BARRIER FREE ACCESSIBILITY

ACKNOWLEDGEMENTS/RESOURCES

- Queen’s University at Kingston
- City of North York
- City of Peterborough
- Alberta Transportation and Utilities
- C.N.I.B. (Canadian National Institute for the Blind
- Ontario Building Code
- Canadian Standards Association
- City of Mississauga
- K-W Barrier-Free Advisory Committee
BARRIER FREE ACCESSIBILITY

APPENDIX “A”

International Symbols of Accessibility

- International Symbol of Accessiblity for Disabled
- International Symbol of Accessibility for Visually Impaired
- International Symbol of Accessibility for Hearing Impaired

International Symbol of Accessibility combined with Service Identification Signs indicate those facilities which are accessible.
O. PROTECTIVE MEASURES FOR TREES DURING CONSTRUCTION

PROTECTIVE MEASURES FOR TREES DURING CONSTRUCTION

NO CONSTRUCTION OR EXCAVATION IS TO OCCUR ON LOTS THAT REQUIRE TREE PRESERVATION UNTIL PROPER APPROVALS HAVE BEEN GIVEN BY A CITY ARBORIST.

1. When trees are apt to be damaged, they should be protected with fencing. These barriers protect the roots, trunk, and branches during development, as well as the understory and ground cover. (Figure 1). Small lot by lot tree savings would require snow fencing with metal posts (Drawing 1 – Specifications for Snow Fencing). Long term development construction and construction adjacent to Environmental Special Policy Areas would require special pavo wire fencing (Drawing 2 – Specifications for Pavo Wire Fencing). The type of fencing used is determined during the site visit by the Inspecting City Arborist. Fences should be located at a minimum of 1.5 times the crown radius of the tree from the dripline (Figure 2), 360° around the perimeter of individual or clustered trees.

2. Whenever possible, avoid cutting surface roots. In excavation, if root cuts are necessary, it should be done quickly, making smooth, flush cuts supervised by an Arborist. Then the roots should be backfilled and watered before the roots have a chance to dry out. Where roots have to be removed, there may be a subsequent decline within the tree branches. Branches should be removed only if damage occurs.

3. Do not deposit, place stone, or maintain any stone, brick, sand, concrete, silt, or other materials or equipment which may impede the free passage of water, air, or nutrients to the roots of the tree. Such actions could lead to halting of operations and a fine of up to $10,000.

4. Heavy equipment should not be allowed to compact the soil over the root zone of existing trees. To avoid damage to trees that are to be protected, access routes should be established away from protected areas.

5. Stuntwise pruning, root feeding, barrier installation, watering during dry season, and other tree protective measures should be carried out prior to, and/or during construction for optimum results.

6. New sidewalks, paving or asphalt must allow breathing space for tree roots. The following should be used as a guideline: For trees up to 100mm trunk caliper to be spaced in asphalt or paving, 2.5 m² of pavement area surrounding the tree is needed to allow breathing space for tree roots (Figure 3). For each additional 5 centimeters, 1 more square meter is required.

*note: small lot by lot tree savings now requires pavo wire fencing rather than snow fencing with metal posts.
7. It is best not to disturb original grades around trees and in areas of protective fencing. Also, road grades should match topography at the curb lines to maximize tree retention in boulevards and front yards.

8. Take measures to preserve the understory and ground covers.

**Other Damage Prevention Techniques**

Healthy strong trees will reduce homeowner costs for treatments or removals and reduce the risk of property damage. The following is a list of Damage Prevention techniques that can be employed during construction to reduce the impact of grade changes and construction practices on the health of trees (ISA, 1999):

1. Bridging over the root system instead of conventional walkways.
2. Cantilevers or pilings can substitute excavated foundations.
3. Protective fencing to protect root systems i.e. make sure fencing is as far away from the tree as possible (Note: even foot traffic from construction workers can compact the soil).
4. Spread thick layer of mulch (6-12" deep) for weight dispersal. Can also place large plywood sheets over the mulch to enhance the effects of weight dispersal.
5. Carefully remove mulch when completed and do not allow the mulch to remain on site for extended periods of time, as it will suffocate vegetation.
6. It’s better to tunnel under a tree’s root system than to cut through it.
7. *“Vertical Mulching”* Aeration of compacted soil by drilling holes in the soil and fill with peat moss, sand, vermiculite, pea gravel etc.
8. When the grade must be raised, trees should be thoroughly aerated before increasing the grade. The original soil surface should be loosened to increase soil to soil contact with the fill.

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*How Roots Grow*

If roots for heat for hydrophobic protective summary.doc
Tree Saving Design Submissions (Phase 1)

1. General Information
   - North Arrow and Legend
   - Title Block - include the scale (horizontal & vertical), date, and a place for the City of Waterloo's crest & Forester's stamp
   - Boundary Lines and Study Area Boundary
   - Lot Numbers & ID Numbers
   - Identity Blocks of Present Land Use Surrounding Construction Area
   - Proposed Street Pattern
   - Location & Extent of Woodland

2. As Phase 1 of the Plan, submit:
   a) Detailed Site Plan of the proposal Plans will be checked and approved:
      - Dimensions & Bearings of Land
      - Location of Setbacks
      - Existing & Proposed Lot Grades (cross-section)
      - Location of Paving, Driveways & Walkways
      - Utility & Service Connections
      - Cut & Fill Areas
      - Locations of Proposed Topsoil Stockpile
      - Indication of Surface Drainage
      - Location of Trees for Preservation & Removal
      - Altering
   b) Tree Inventory & Analysis:
      i) Site Characteristics
         - Woodlot/Tree Inventory
         - General Topography
         - Contours (0.3 metre intervals)
         - Soils (type, texture, properties, extent)
         - Groundwater Location and Drainage (stream, surface water, pond, wet areas)
         - Existing Land Use
      ii) Environmental Assessment on wooded (and Wetland) areas
   c) Summary Report of impacts, construction details and erosion control & recommendations

Plan of Subdivision Approval (proceeding Tree Saving Plan approval)

Tree Saving Design Submissions (Phase 2)

1. General Information
   - See "General Information" from Tree Saving Design Submissions (Phase 1)

2. As Phase 2 of the Plan, submit:
   - Street Name
   - Style of House
   - Location of Building Envelope
   - Setbacks
   - Show all existing trees, and indicate which are to be saved and which are to be removed
   - Location of Protective Fencing
   - Building Lot Approval
*Note: City protective fencing is the paige wire fence detail, not the protective snow fencing.