UNIVERSITY DISTRICT

URBAN DESIGN MANUAL WITH THE CITY OF CALGARY

West Campus
DEVELOPMENT
TRUST

THIS DOCUMENT WAS ACCEPTED FOR INFORMATION BY CALGARY PLANNING COMMISSION ON NOVEMBER 3, 2016

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1. PURPOSE & SCOPE

The West Campus Development Trust and The City of Calgary together have established the need for a collaborative process which will improve efficiency and expectations in the development review process in order to meet the following shared objectives for the University District Project:

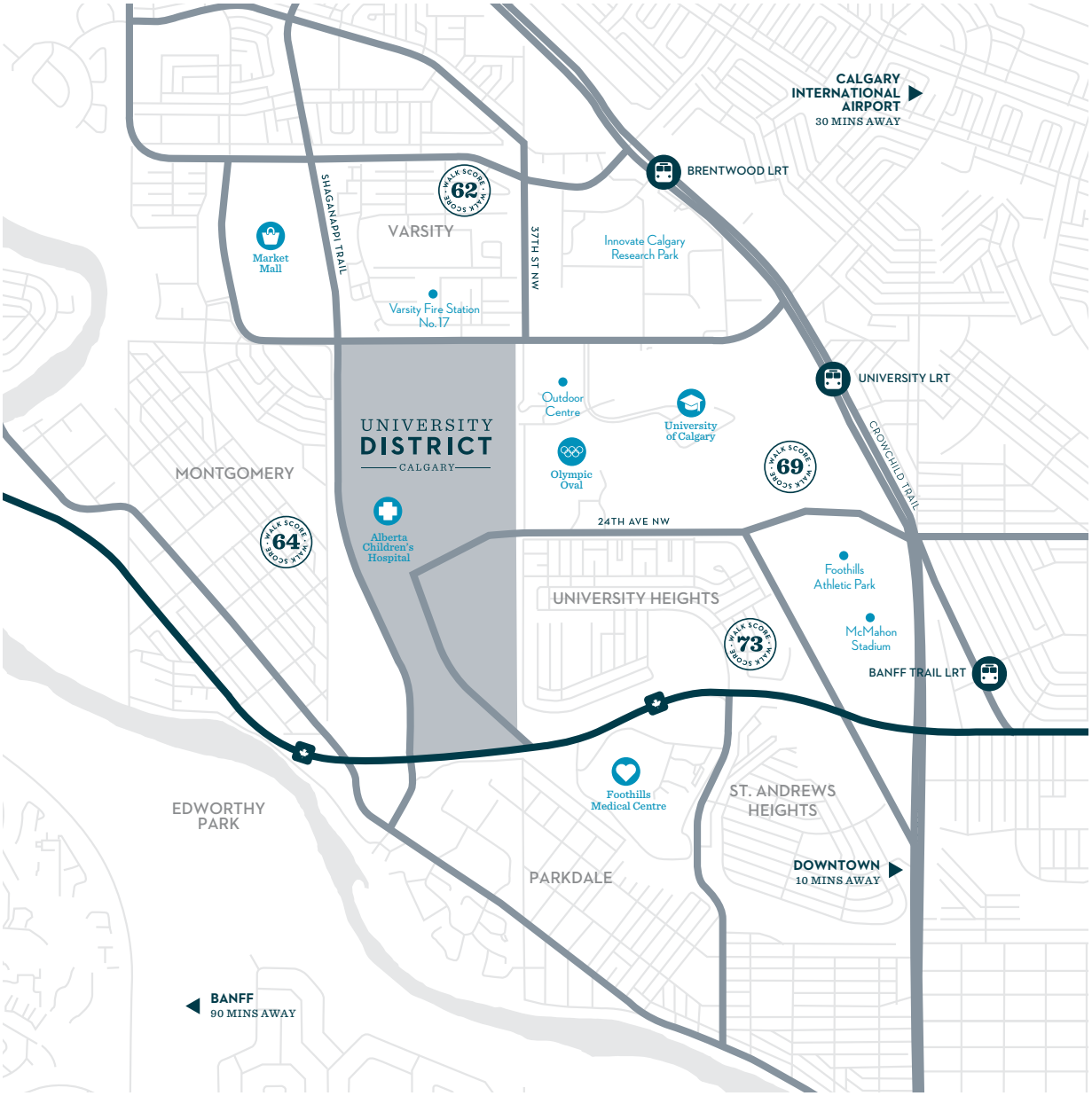
- Continued alignment with the vision for University District and the Municipal Development Plan;
- Consistency in review of the applications, through staff changes and the life of the project;
- Streamlined development permit review timelines; and
- The creation of a high quality public realm and built form.

The purpose of this document (the Manual) is to outline this new process and identify those elements within the University District which will follow this new approach.

2. UNIVERSITY DISTRICT VISION

CALGARY'S COMMUNITY, MINDFULLY MADE.

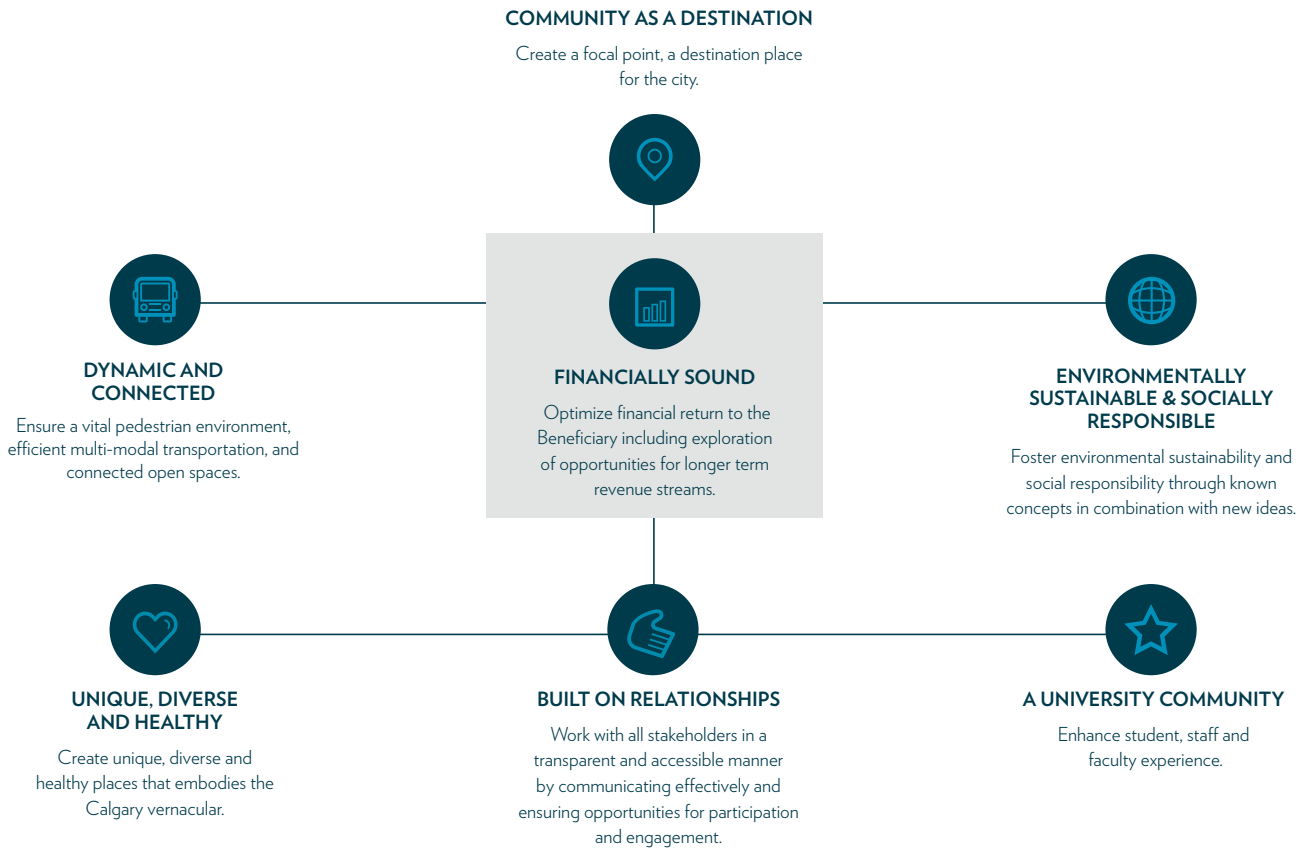
University District is located immediately west of the University of Calgary's main campus in northwest Calgary. The vision for the lands, created through comprehensive consultation with stakeholders, imagines a complete, vibrant and sustainable mixed-use community underpinned by high quality and performance-oriented design, which accommodates a rich, urban quality of life for residents. The community promises to be the leading choice for residential, office and retail markets in the city's northwest quadrant, ideally positioned near primary medical facilities, the main campus, and within minutes of light rail transit, the downtown core and countless other amenities. The community will set a new standard for sustainable development; a response to economic needs of the present while inspiring rich and practical benefits for individuals and the community as a whole.



3. PRINCIPLES FOR PLANNING & DESIGN OF THE SITE

GUIDING PRINCIPLES

The Guiding Principles are the foundation behind the planning and design of University District.



The Site Plan and Building Design guidelines strive to ensure that new development is compatible with the vision and urban design strategy. The community has been planned to consist of buildings that are diverse, yet compatible in a richness in quality. The Site Plan and Building Design guidelines are informed by the Urban Design Guidelines.

URBAN DESIGN PRINCIPLES

STREETS AS GLUE

Streets form the "glue" that binds a diverse community together. They become outdoor rooms at the ground plane when bounded by appropriately-scaled buildings. They contain the landscape that adds the richness of nature to the city. And, they support the day-to-day activities that make for an active and vibrant community.

A PORCH CULTURE

The concept of a porch culture on the street is derived from the notion that all ground level street facing dwelling units have direct access from the fronting streets. It is also critical from a street security standpoint to have eyes and ears on the street.

A PUBLIC GROUND FLOOR

Placing public-oriented uses on the ground floor increases the social experience and diversity in the community. Uses like retail, studios, and home offices animate the ground floor and provide useful services to residents.

COMMUNITY MEETING PLACES

An important place in a neighbourhood occurs at the intersection of streets. This is a point of high interaction amongst people where they arrange to meet, or simply bump into each other. Small public plazas, bordered by uses like retail, cafes, community facilities, and main building entries, will facilitate these meeting places.

ACTIVE RETAIL STREET

University District is the major east-west corridor connecting the community to the University campus. It is the retail core for residents, visitors, and students alike. Therefore, it has the highest order in the hierarchy of streets containing critical active uses, such as shops, restaurants, and community functions. The architecture along this street should be inviting and create a human-scale environment.

LANDMARK BUILDINGS

The plan allows for higher buildings, located on Blocks 13, 14, 15, 16, 17, 22, and 24. By considering the design of these higher buildings as an urban grouping, they become iconic elements in the community landscape.

MAJOR LANDSCAPE ELEMENTS

Landscape concepts can be used as a major organizing element of the new plan. For example, certain zones of the site landscape can create major landscape statements and establish key nodes of public interaction.

ACTIVE COMMUNITY PARK

The plan identifies a major open space in the south neighbourhood. This space should be clearly identified as the major place for community outdoor activities with paths and bikeways directed to this space and connected to adjacent neighbourhoods and community facilities.

DEMONSTRATED SUSTAINABILITY

The sustainability mandate for University District is exemplary. Sustainable approaches that are made visible by demonstration throughout the site will contribute to the educative value of these strategies.

PRIVATE VERSUS PUBLIC SPACE

Typically, a clear distinction is normally made between those spaces that are for public use and those that are for the exclusive use of residents. An alternative approach is to blur the edges somewhat between these zones in order to create greater interaction amongst people. Small plazas adjacent to building lobbies and green courts within private development sites are examples of spaces for the use of residents that also allow for some public transitioning through blocks.

INVITING LIGHTING

Inviting lighting is critical to establishing an atmosphere that feels friendly, warm, and safe for users of the site at night. Although street lighting will be defined for the site, it can be augmented with atmospheric lighting in public and private spaces and walkways.

PEDESTRIAN CONNECTIONS

A system of pedestrian connections provides greater continuity and choice in the way people move about the community. Pathways through private development sites will allow for both resident and public circulation across blocks to connect to public open space while maintaining privacy for residents.

BUILDING DESIGN DIVERSITY

Building diversity is a key component of the plan because it will create a more interesting environment for University District. Architectural variety throughout the site can be achieved by allowing for a variety of developer proponents and design firms for buildings, and encouraging varying styles of architecture while respecting the Calgary context.

MATERIAL AND COLOUR PALETTE

A clear palette of materials and colours for buildings and open spaces is key to establishing a well-knit community.

VIEW PRIORITY

One of the important aspects of marketing the University District residences will be the availability of distant views from individual units. The key views are of the river valley and Rocky Mountains to the west.

INNOVATION ZONE

The innovation zone will promote housing diversity by accommodating a mix of housing units within a block. (See Appendix 3).

PLANNING APPROACH: THE ESSENTIAL INGREDIENTS

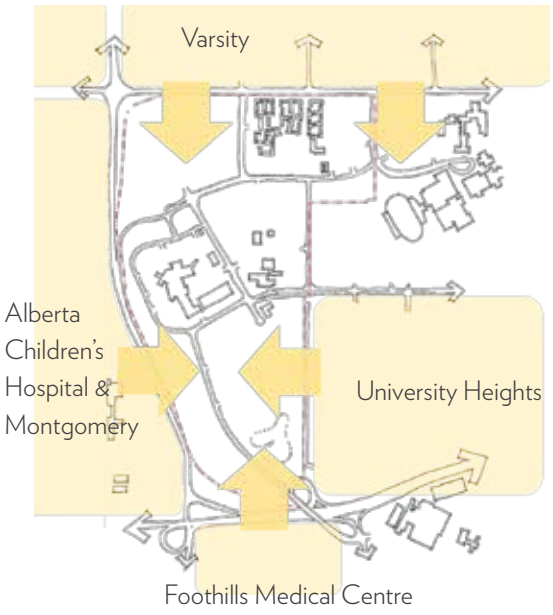
The planning approach for the University District applies several key ideas that are considered 'Essential Ingredients' of the plan:

- Building a strong community inside and out – achieving a critical mass of residents to support amenity and service- based land uses.
- Creating a development scenario that offers a diversity in use and form and respectfully integrates and transitions to surrounding uses.
- Creating a plan that increases modal opportunities, encourages walkability, and is permeable and accessible.
- Providing a public realm context that is beautiful, diverse, supports a healthy lifestyle, and provides activity, animation, and socialization.
- Anticipating and addressing the needs and aspirations of future generations.

1 COMMUNITY BUILDING & CRITICAL MASS

Integrating the University with Surrounding Communities

Accessible to all through a network of connections, the new community will encourage the integration of new uses with the surrounding communities and facilities. The new community will function as a hub and destination for the surrounding communities and the City as a whole. People from the surrounding areas will be able to come to University District to shop, eat, work, and play. In doing so they will contribute to the economic and social viability of the community.



Four Distinct & Emerging Communities

Four distinct neighbourhoods emerged in the early stages of the plan. The structure of the existing uses and geography led to development of two residential neighbourhoods in the north and south, offset in the centre by both a professional district and an urban corridor. The plan is based on the concept of "living where you work and play". The plan fosters a complete community by integrating existing uses with new opportunities.

In turn, the new community also benefits through the local presence of two essential institutions - university and medical -within a walkable distance.

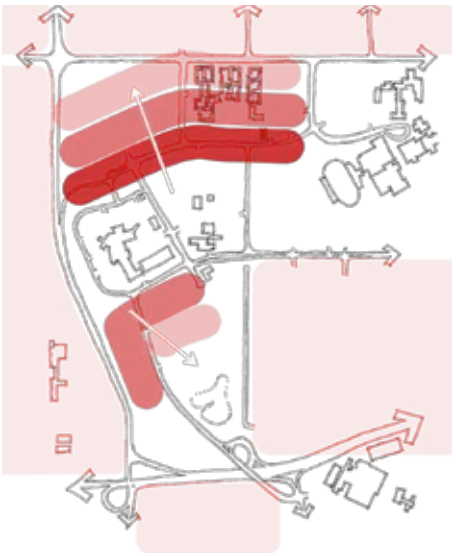
East-West Main Street & Active Nodes for Amenities

Every complete community pulsates around a central and accessible heart. Generating activity and vitality in the new community is a core ingredient of the plan, hence the importance of creating a centrally located main street with a series of activity nodes that provide local and destination oriented amenities and high level of animation. The main street is mixed in use, made up of commercial uses at-grade with residential uses above. It is defined by a clustering of plazas, retail, and destination uses along the street creating activity nodes that draw people to the area, helping to animate the street, and encouraging community vitality.

2 DIVERSE BUILT FORM FRAMEWORK

Transition of Density & Building Heights to Existing Neighbourhoods

The planning approach considers a development form and structure that is compatible with the adjacent communities. Density and height respectfully transitions down from the main street core to the adjacent communities. This planning decision also fashions the character of the development by creating a hub of activity with increased density in a retail corridor along main street.



3 TRANSPORTATION OPTIONS & CONNECTIVITY

Connected Pedestrian and Bicycle Network & A New and Enhanced Street Grid with Connections for Traffic & Pedestrians

The central premise of any "complete" community is providing people with options—for transportation, for housing, for where to work—and this community is no different. The University District is designed around four main mobility options: walking, cycling, public transit and driving. The transportation network prioritizes pedestrian traffic because cyclists, transit users, and drivers are all pedestrians at some point in their journey. All the features work together: well-connected pedestrian and bike networks; a new and enhanced street grid with multiple connection options to facilitate pedestrian and traffic flow; new gateways that are opportunities to build identity; and, an efficient and accessible transit network.

4 DIVERSITY OF OPEN SPACE

North-South Green Spine & Open Space Nodes

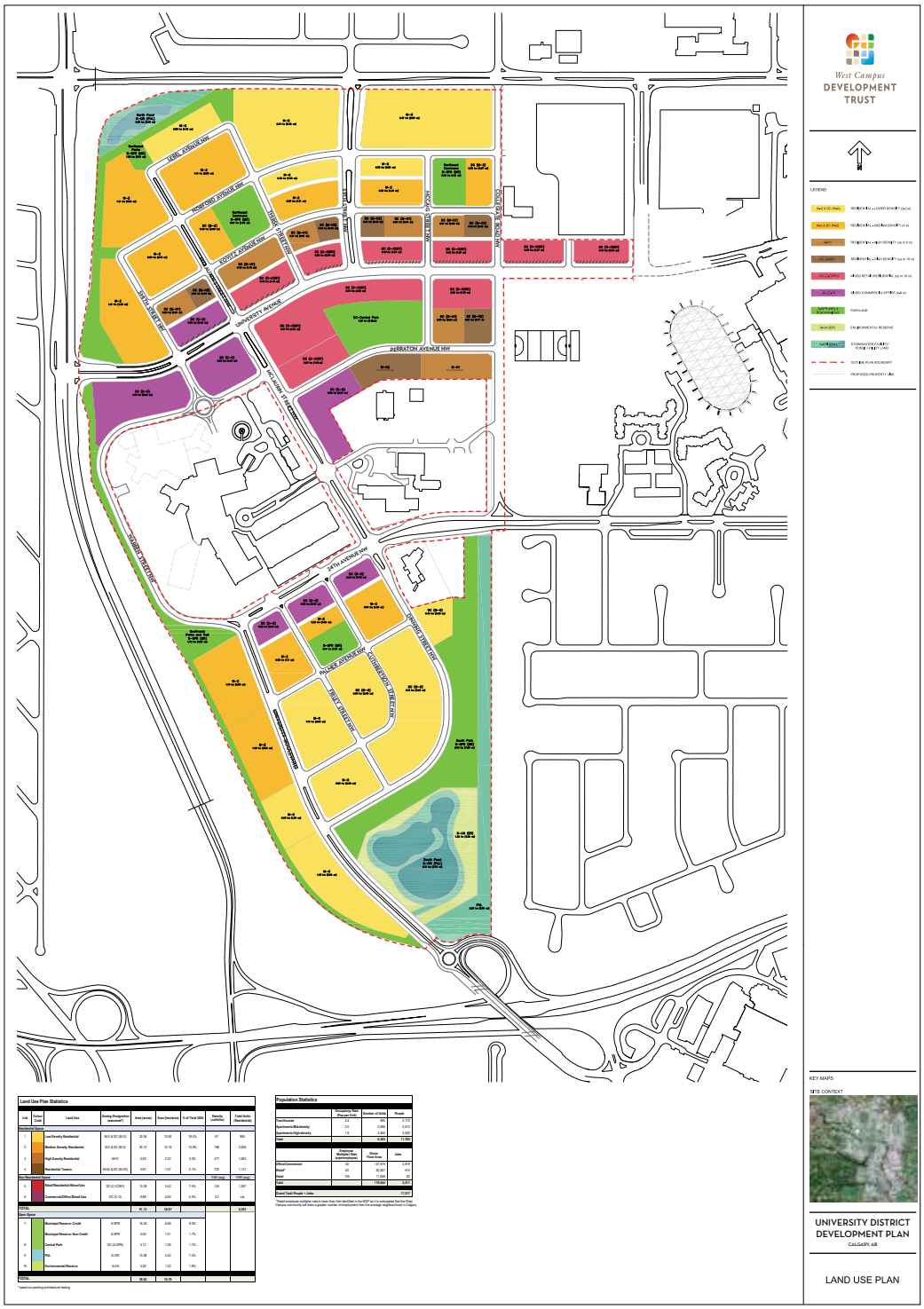
Open spaces and parks play a critical role in drawing people into the community and enlivening the street and urban life of the area. At the core of the open space framework is a "green spine" that runs north-south through the development and links to the Central Park and main street, new neighbourhood parks, and the University greens. The spine transitions from a tree-lined pedestrian and bike trail at the north to an enhanced existing park and storm pond to the south.

The Perimeter Recreational Greenway & Trail | Integrated Neighbourhood Parks, Green Streets and Linkages

The easterly green spine connects with a perimeter trail system, which together create a unique perimeter greenway around the entirety of the community. The perimeter greenway connects existing and new open spaces and trails, and links to new tree-lined streets and pedestrian connections. Enhanced landscaping along streets serves the mutually supportive purposes of beautifying the street and providing a safe environment for off-road multi-use trails.

LAND USE PLAN

In 2015 the University of Calgary approached the Trust regarding a boundary adjustment. The proposed plan is included below and the land use revision is currently in the City of Calgary's approvals process.



4. PUBLIC REALM ELEMENTS

A. MOBILITY PLAN

University District incorporates a diverse range of uses and intensity of development. The proposed mobility network provides a variety of transportation options for people. The "feet first" precedence is demonstrated through the connectivity of sidewalks and pathways, providing easy routes to local amenities and transit stops. On-street bike lanes and separate bike paths will further enhance connectivity within University District with neighbouring communities. A regional pathway will loop around much of the perimeter of University District to facilitate commuter and recreational cycling around the development.

TRANSPORTATION DEMAND MANAGEMENT

The Transportation Impact Assessment conducted for the development identified a series of measures and strategies to promote alternative modes of transportation and reduce reliance on private passenger vehicles. The following strategies will be applied in University District and are also part of the LEED-ND application:

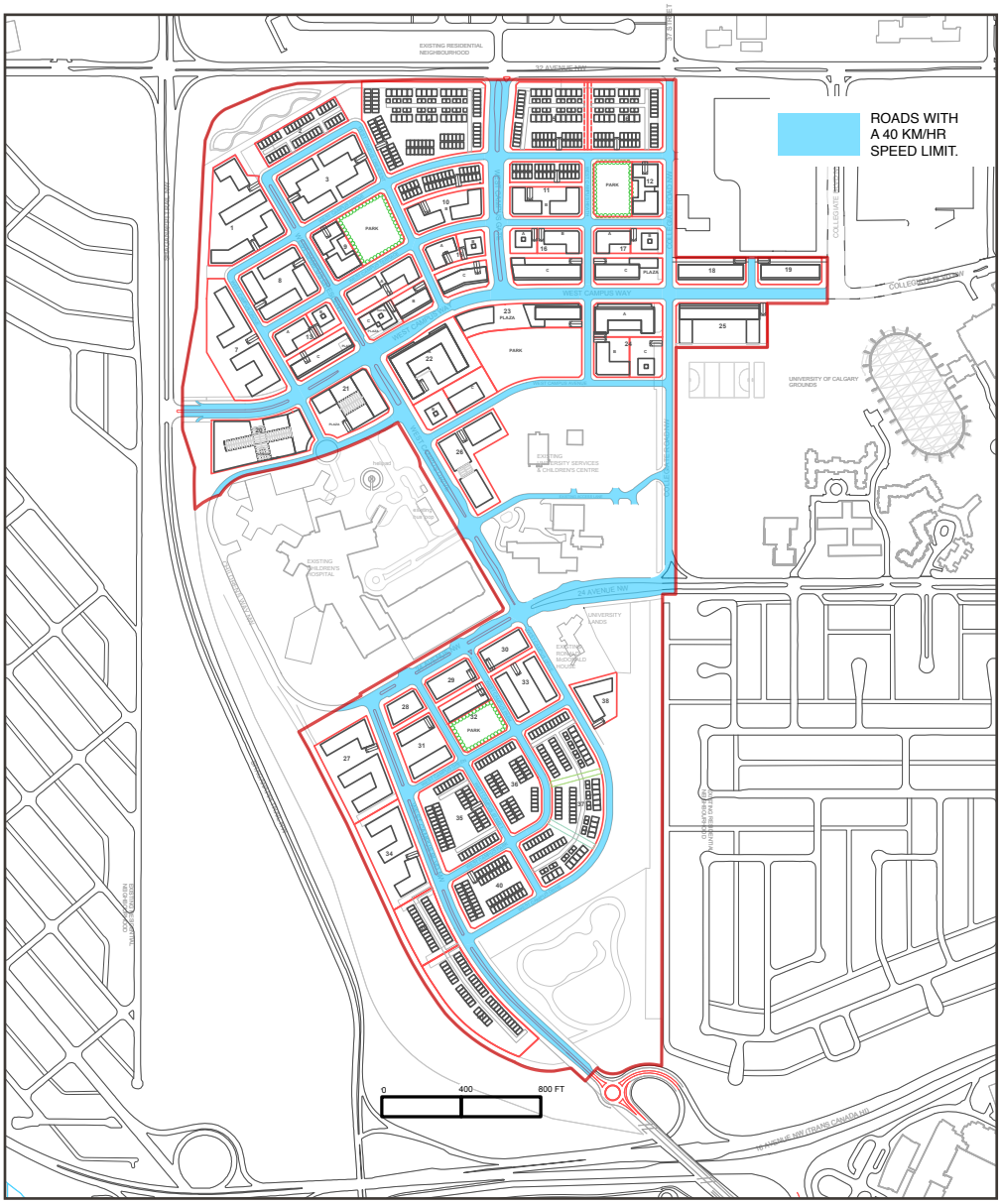
- Promotion of walking and cycling through the street network and cross-sections.
- Incorporation of a car-sharing program (ex. such as Car2Go). Ample parking will be available for car-sharing program use on streets.
- Designated carpool parking stalls for non-residential and mixed use buildings (see Buildings – Sites for requirements)

TRANSIT

In November 2014 the Trust and Calgary Transit committed to work collaboratively to implement enhanced transit facilities for University District. This work was identified to be conducted as part of the NW Transit Enhancement Study. With future University District facilities to include bus shelters, benches, illumination and display schedules and route information to increase the experience of the rider while waiting for transit. Current facilities would also be upgraded to include these elements.

REDUCED SPEEDS

In July 2015 the Trust and City of Calgary's Transportation Department committed to work collaboratively with the aim to implement a 40 km/hr speed limit for University District. This reduced speed is intended to increase safety for both pedestrian and bicycle travel which has been attributed to lower speeds.



B. STREETSCAPE ELEMENTS

The streetscape elements which include Street Surfacing, Crosswalks, Street Lighting, Street Furniture, Street Planting, Shallow Utilities, Stormwater and Innovative Elements were determined to have the greatest impact on creating the sense of place for the University District community. The appropriate combination and placement of these elements is necessary to create high quality streetscapes with distinct character.

The Streetscape Principles established provided a clear foundation and direction to make informed decisions on material selection for these elements that will support the intended character and function of the streets.

The pursuit of higher density communities requires a different set of design principles and standards than that of traditional suburban developments. Higher density living requires higher quality urban environments that are engaging, active, easy-to-use and, simply put, have an appealing public realm.

MUNICIPAL DEVELOPMENT PLAN / CALGARY TRANSPORTATION PLAN

The streetscape elements were measured against their adherence to the MDP and CTP. The following policies were specifically targeted:

MACs should be developed to function as an "urban centre" for a sub-region of the city and provide opportunities for people to work, live, shop, recreate, be entertained and meet their daily needs."

Policy 3.3.1 (i) Pedestrian environments should be the priority design element, focusing on pedestrian convenience, safety, comfort and enjoyment.

Policy 3.3.1(j) Create an internal street network that is interconnected, multi-modal and recognizes the needs

Policy 3.3.2 (h) Open spaces that provide for a wide variety of activities within a medium to high density environment are encouraged. This will include the creation of public plazas and key gathering areas

3.3.1 (s ii) Provide social spaces that provide for a comfortable and interesting public realm

3.3.2 In addition to achieving higher concentrations of jobs and population, the design and character of the MACs must also create a high-quality environment that features amenities for a comfortable street environment.

UNIVERSITY DISTRICT MASTER PLAN

The University District vision is to achieve a complete, vibrant, and sustainable community that enhances the University experience, while harmonizing with surrounding communities.

The streetscape elements were measured against their adherence to the University District (formerly West Campus) Master Plan. The following were specifically targeted:

Connected & Pedestrian Focused: Providing a dynamic development with a vital pedestrian environment, efficient multi-modal transportation, and connected open spaces.

Unique & Diverse: Creating a unique, diverse, and healthy community that embodies the Calgary vernacular to create a high quality built form and open spaces.

Urban Design: Urban design should be used to ensure that the intensification of land use occurs in a sensitive manner and that new buildings contribute to a pedestrian-friendly streetscape.

STREETSCAPE PRINCIPLES

LIVABLE, CONNECTED & PEDESTRIAN ORIENTED

Foot power will be given precedence over horse power.

Bicycle and transit infrastructure should be incorporated to elevate the experience of the pedestrian.

All of the elements that make up the public realm - including sounds, sights and amenities – will come together to create a public room characterized by safety and comfort.

SUSTAINABLE, DURABLE & HIGH QUALITY

Health and sustainability is a foundational part in the hierarchy of all systems, the selection of materials, and the implementation of construction practices.

Maintenance will be applied in context to be efficient, effective, and tailored to enhance the experience of the pedestrian.

Materials will be lasting and withstand the test of time.

NOTABLE, ICONIC & INNOVATIVE

Consistency in quality and style throughout the community that will be engaging for residents and visitors alike.

Elements will strive to be distinctive in character and scaled to enhance their surroundings.

Simplicity will be utilized as a tool for innovation

VIBRANT, ACTIVE & ADAPTABLE

The design and architecture of buildings will enhance the public realm and the pedestrian experience while forming the backdrop to everyday life.

Architecture will include higher quality design and features to ensure flexibility, promote active frontages, and good flow of pedestrian traffic.

Streets will form the "glue" that binds a diverse community together, supporting the day-to-day activities.

The following Priority Streetscape Elements are key to establishing the unique sense of place for the University District Community. Careful consideration of each of these elements and the complimentary design interaction between all the elements will create a distinctive streetscape for this new urban center. These elements have been weighed against the MDP/CTP Principles, University District Master Plan and Streetscape Principles for their adherence.

SURFACING

CROSSWALKS

STREET LIGHTING

STREET FURNITURE

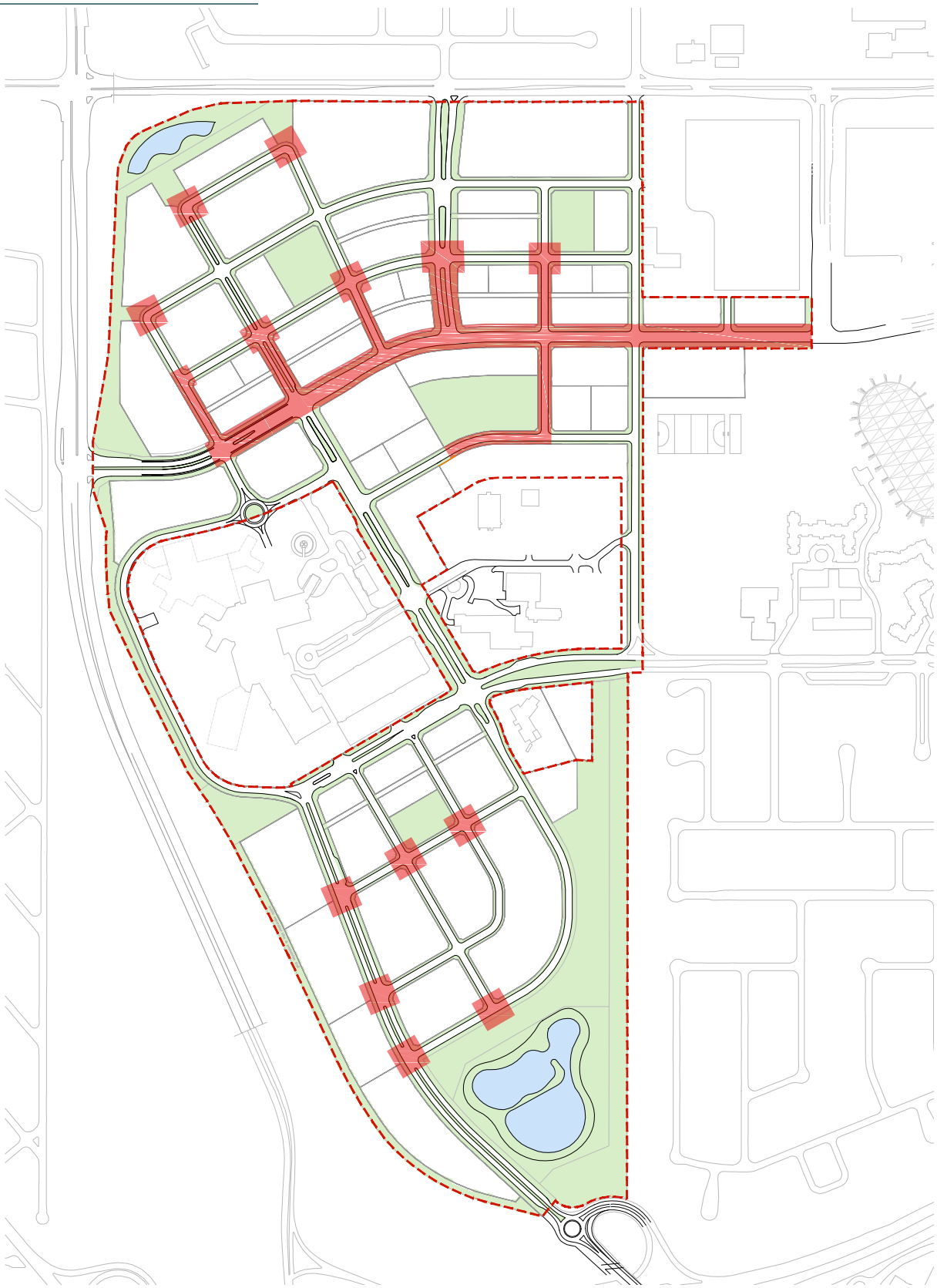
STREET PLANTING

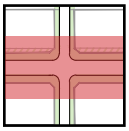
SHALLOW UTILITIES

STORMWATER

INNOVATIVE ELEMENTS

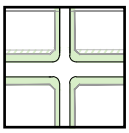
Streetscape Urban Realm Priorities





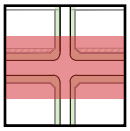
PRIMARY URBAN ELEMENTS

- Surfacing
  - Street - Concrete Pavers with Concrete Trim
  - Sidewalk - Concrete Pavers with Concrete Trim, Granite Accents
- Crosswalks
  - Layout - Bulb-outs
  - Surfacing - Concrete Pavers with Concrete Trim
- Street Lighting - Catalog Light Pole and Luminaire
- Street Furniture - Catalog or Custom Bus Shelter and Coordinated Components
- Street Planting - Modified Tree Trench and Structural Soil Options
- Stormwater - Potential Hard Surface Below Grade Infiltration Pilot Projects
- Shallow Utilities - Hybrid Distribution System
- Innovative Pilot Projects



RESIDENTIAL URBAN ELEMENTS

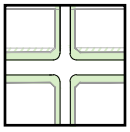
- Surfacing
  - Street - Standard Asphalt
  - Sidewalk - Standard Concrete
- Crosswalks
  - Layout - Bulb-outs
  - Surfacing - Asphalt with Thermal Applied Pattern
- Street Lighting - Extend Elements of Primary Urban into Residential
- Street Furniture - Extend Elements of Primary Urban into Residential
- Street Planting - Standard Tree Trench
- Stormwater - Potential Bioswale/Rain Garden Infiltration Pilot Projects
- Shallow Utilities - Modified Standard Distribution System
- Innovative Pilot Projects



PRIMARY URBAN ELEMENTS

This typology defines the University District High Street, adjacent sections of roads entering the core area and important intersections. This entails the highest level of enhancement considerations and deviation from the city standards. It is essential that the streetscape elements within this typology define the High Street as an identifiably unique destination within the community. The elements need to define gateway moments at each end of the High Street and have to clearly delineate the various modes of transportation to provide a safe pedestrian environment.

This typology also defines the areas that function as special gateway moments to significant areas within the plan such as the High Street and the park spaces. The focus is on the moments before entering the High Street as well as the intersections throughout the plan that are connected to key open spaces. These areas entail a lower tier of enhancement considerations or deviation from the city standards, to that of the High Street. The choice of streetscape elements must consider reflecting the character of the places that they are associated with and connected to, and create a draw into the spaces.



RESIDENTIAL URBAN ELEMENTS

This typology defines the balance of streets and including particularly the entry streets within the Plan. The function of the streetscape elements are to define the gateways into the community and reflect the unique characteristics of each of the precincts within the plan, such as the north and south neighbourhoods, the health and wellness district, for example. In addition, the elements need to provide the greatest level of cohesiveness and commonality in design as they define the major roadways in the plan.

This typology also defines the residential streets. It entails a lower level of streetscape enhancement in comparison to the other typology and may entail the least variation from the city design standards. Continuity in the design elements will be an important consideration in these areas.

1. Surfacing

Pavement is an essential component which expresses the design character of any streetscape. Enhanced paving treatments can improve public spaces in a city, give circulation areas a stronger sense of place and enhance the hierarchy of public spaces. Surfacing in University District should be used to both define the edges of spaces and visually enhance and connect entire spaces. It is vital that the surfacing materials create a unique, accessible and compact street that will enhance commercial vibrancy and generate a unique sense of place.

SURFACING – STREETS

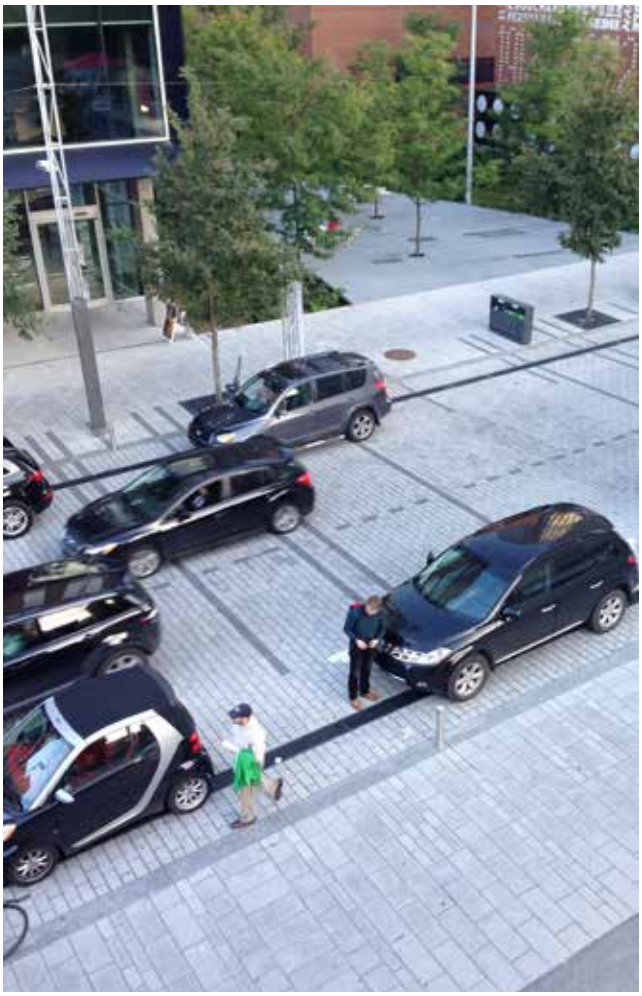
Surfacing - Streets	City Approval	Benefits	Limitations	Cost	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Street – Standard asphalt	Standard	• Ease of construction and approval	• Not pedestrian oriented • No sense of place • Not unique • Doesn't demonstrate objectives and principles of West Campus	$	★	★	★	★	2
Street – Standard poured-in-place	Previous City Approval	• Somewhat pedestrian oriented • Somewhat unique • Somewhat slows traffic	• Potential higher replacement costs • More difficult to match replacement	$$$	★★	★★	★★	★	3
Street – Coloured concrete, additional jointing	Previous City Approval	• Somewhat pedestrian oriented • Somewhat unique • Somewhat slows traffic	• Potential higher replacement costs • More difficult to match replacement • Tire tracks mark surface	$$$$	★★	★★	★★★	★★	5
Street – Patterned Concrete	Non-Standard	• Somewhat pedestrian oriented	• Non-authentic surface • Jointing and pattern are not complementary • Replacement is usually difficult and unsightly • Cracking usually conflicts with pattern • Uneven surfaces • Tire tracks mark surface	$$$$	★★	★	★	★	6
Street – Concrete pavers	Previous City Approval	• Pedestrian oriented • Provides sense of place • Unique • Slows traffic • Easier to match replacement • Demonstrates objectives and principles of West Campus	• Higher installation costs • Some surface marking by tire tracks	$$$$	★★★★	★★★★	★★★★★	★★★★★	1
Street – Granite pavers	Non-Standard	• Pedestrian oriented • Provides sense of place • Very Unique • Slows traffic • Easier to match replacement • Demonstrates objectives and principles of West Campus	• Very high installation costs	$$$$$$	★★★★	★★★★	★★★★★	★★★★★	4

Note: Comparative ranking is a priority based on a review of the cost implications vs. an average of the importance to principles.

$ Low Cost = High Ranking
$$$$$$ High Cost = Low Ranking

★ Low Importance = Low Ranking
★★★★★ High Importance = High Ranking

SURFACING – STREETS



CONCRETE PAVERS

Very pedestrian friendly

Provides sense of place

Unique

Slows traffic

Easier to match replacement

Best demonstrates objectives and principles of University District

SURFACING – STREETS

CAST-IN-PLACE COLOURED CONCRETE

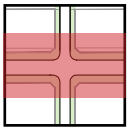
Unique to Calgary

Slows traffic

Concrete to be a non-slippery surface and compatible with snow and ice removal

SURFACING – STREETS

SUMMARY



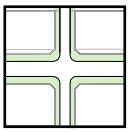
PRIMARY URBAN

CONCRETE PAVERS

- Recommended as the main surfacing material for the Primary Urban Streets at the four center blocks on University Avenue.
- Recommended as surfacing at Primary Urban intersection crosswalks.

POURED-IN-PLACE

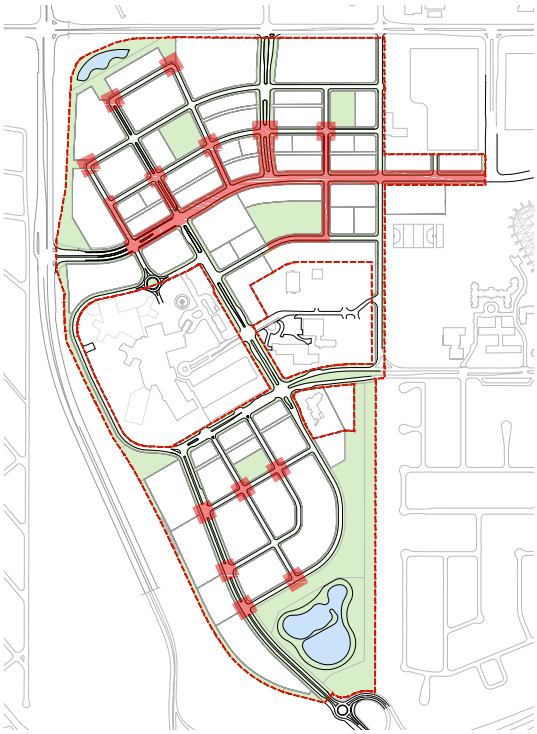
- Coloured concrete with additional jointing is recommended as an edger or divider to retain areas of pavers.
- Recommended as surfacing at center portion of intersection at Primary Urban areas.



RESIDENTIAL URBAN

STANDARD ASPHALT

- Recommended on all remaining residential streets.



ADHERENCE TO:

- ☑ MDP/CTP PRINCIPLES
- ☑ UNIVERSITY DISTRICT MASTER PLAN
- ☑ STREETSCAPE PRINCIPLES

SURFACING – STREETS

PAVER TYPE:
VS-5

MANUFACTURER:
Expocrete / Oldcastle

www.expocrete.com

MANUFACTURING LOCATION:
Balzac, Alberta

SPECIFICATIONS:
Interlocking roadway paver

MATERIAL QUALITY AND BENEFITS:
High Strength: Concrete pavers are manufactured in a steel mold under exacting factory conditions & tight dimensional tolerances, thus resulting in a product that is many times stronger than regular poured concrete and more durable than asphalt. The pavers are manufactured from a concrete mix, using a hydraulic press at intense pressures exceeding 2250 PSI. This process creates an extremely dense unit paver which possess exceptional strength and durability, superior stability under severe loads, and is unaffected by heat and cold extremes. The pavers can withstand years of abuse and last for generations.

Safety: On both vehicular and pedestrian applications pavers have a non-skid surface, even when the pavers are wet they are safe to walk or drive a vehicle over them.

The VS-5 paver offers excellent pavement stability for heavy vehicular traffic. The grooves on all four sides of the paver and on the fifth side underneath ensure an enhanced, multi-directional interlock, while the smooth surface offers wheelchair accessibility.

Flexibility: In addition these interlocking paving units allows for expansion and contraction without producing surface cracks, unlike monolithic concrete surfaces and stamped concrete. Each unit has joints that allow for a small amount of movement without cracking.

Weather Resistance: Concrete pavers resist deterioration of freezing and thawing cycles and deicing salts better than asphalt and ordinary poured in place concrete. Snow can be plowed, blown or shoveled just like asphalt or concrete pavements. The beveled or chamfered edges of pavers prevent plows or shovels from catching on the edge. De-icing products such as calcium chloride or salt will not harm the pavers.

Colour and Design: The concrete pavers come in consistent colours and shapes and unlike patterned concrete; paver replacements or pavers constructed in later phases can be matched to the initial installation. Concrete pavers add a flexibility in design that is not possible with any other paving materials. The design quality of the pavers adds value, visual appeal and uniqueness to the streetscape.

The proposed paving structure as detailed in the appendix allows for a porous structural granular base design which is superior to laying pavers over a concrete or asphalt base. This detail design permits drainage of any trapped moisture that may occur below the pavers.

Maintenance: Pavers are low-maintenance and offer lower life-cycle costs than any other paving products such as asphalt, poured concrete, and stamped concrete. Pavers are easily maintained by regular sweeping and occasional rinsing. In the case tough stains, pressure washing with appropriate cleaning solutions or a simple spot treatment with a brush, cleaning solvent & water. Pavers can be repaired by lifting the affected area, re-grading and re-compacting the base and bedding sand and reinstalling the same pavers. It is an inexpensive procedure that leaves no unsightly repair patches. Concrete pavers also provide a functional way for conducting maintenance to the under base or underground utilities. Pavers can be removed and replaced for utility repairs.

SAMPLE INSTALLATIONS:
Calgary: The Shaw building off Barlow Trail, Taylor Library at the U of C, 24th Street at the EEL Building bus turn-around at the U of C, Peter Lougheed Hospital.

Edmonton: Jasper Avenue.

Vancouver: UBC campus.

REPLACEMENT COSTS:
Pavers in Roads including base course- $300/m2

SURFACING – STREETS

PAVER TYPE:

VS-5

MANUFACTURER:

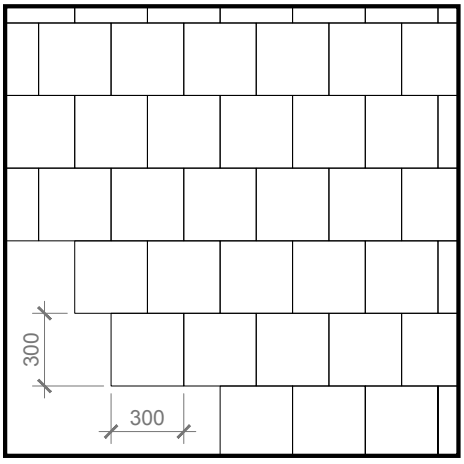
Expocrete / Oldcastle

www.expocrete.com

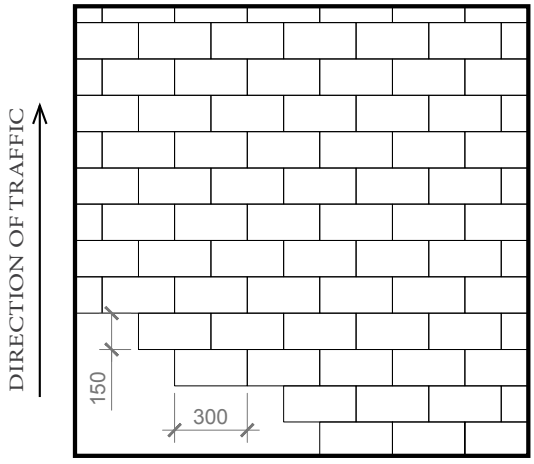
PAVER PATTERNS:

For roadway installation a running bond pattern is recommended.

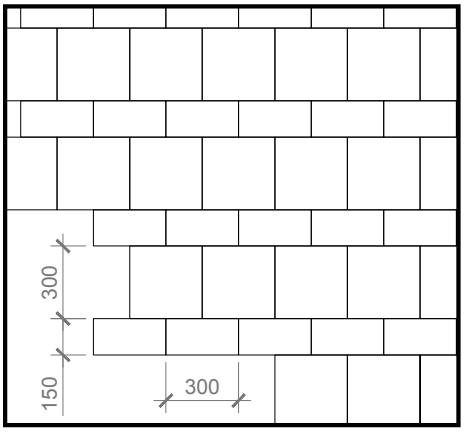
Paving patterns to be coordinated with engineering layout and detail specifications.



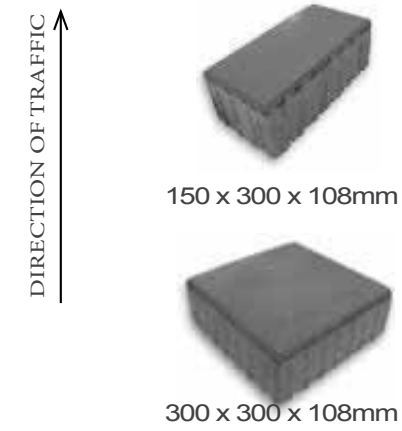
RUNNING BOND
- 300 x300mm PAVERS



RUNNING BOND
- 150 x 300mm PAVERS

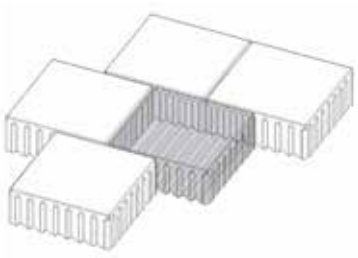


RUNNING BOND
- ALTERNATE BANDS OF 150 x 300 AND 300 x 300mm PAVERS



150 x 300 x 108mm

300 x 300 x 108mm



SURFACING – STREETS

PAVER TYPE:
VS-5

MANUFACTURER:
Expocrete / Oldcastle
www.expocrete.com

COLOURS:
All colours available

- For road surfaces due to tire wear and tire markings; medium grey - dark grey colours are recommended.
- Light coloured reflective pavers recommended for lane markings, stop lines and pedestrian markings.
- Mottled colour or textured pavers are not recommended for roadway.
- Potential for a different colour or pattern in parking lanes.

MEDIUM GREY

DARK GREY

LIGHT COLOURED REFLECTIVE

SURFACING – STREETS

PAVER TYPE:
VS-5

MANUFACTURER:
Expocrete / Oldcastle
www.expocrete.com

COLOURS PATTERN:
A random subtle colour pattern or a single colour is recommended for the road surface as we don't want to provide a distraction on the driving surface.

Another possibility is to have a more distinct pattern on only the parking lane.

A colour mix with too many colours is **not** recommended for the roadway surface.

SOLID COLOUR WITH REFLECTIVE MARKINGS

RANDOM SUBTLE COLOUR MIX

SURFACING SIDEWALKS

Surfacing - Sidewalks	City Approval	Benefits	Limitations	Cost Implications	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Sidewalk – Standard poured-in-place	Standard	• Ease of construction and approval	• Not as pedestrian oriented • No sense of place • Not unique • Doesn't demonstrate objectives and principles of West Campus	$	★	★★	★	★	2
Sidewalk – Coloured concrete, additional jointing	Previous City Approval	• Somewhat pedestrian oriented • Somewhat unique • Somewhat slows traffic	• Potential higher replacement costs • More difficult to match replacement • Not as durable	$$	★★	★★	★★	★★	3
Street – Patterned Concrete	Non-Standard	• Somewhat pedestrian oriented	• Non-authentic surface • Jointing and pattern are not complementary • Replacement is usually difficult and unsightly • Cracking usually conflicts with pattern • Uneven surfaces	$$$	★★	★	★	★★	4
Sidewalk – Concrete pavers	Previous City Approval	• Pedestrian oriented • Provides sense of place • Unique • Slows traffic • Easier to match replacement • Demonstrates objectives and principles of West Campus	• Higher installation costs	$$$	★★★★	★★★★	★★★★★	★★★★★	1
Sidewalk – Granite pavers	Non-Standard	• Pedestrian oriented • Provides sense of place • Very Unique • Slows traffic • Easier to match replacement • Demonstrates objectives and principles of West Campus • Very high durability	• High installation costs • Note: Potential for comparative costs with concrete pavers	$$$$$$	★★★★	★★★★	★★★★★	★★★★★	4

Note: Comparative ranking is a priority based on a review of the cost implications vs. an average of the importance to principles.

$ Low Cost = High Ranking
$$$$$$ High Cost = Low Ranking

★ Low Importance = Low Ranking
★★★★★ High Importance = High Ranking

SURFACING – SIDEWALKS

CONCRETE PAVERS

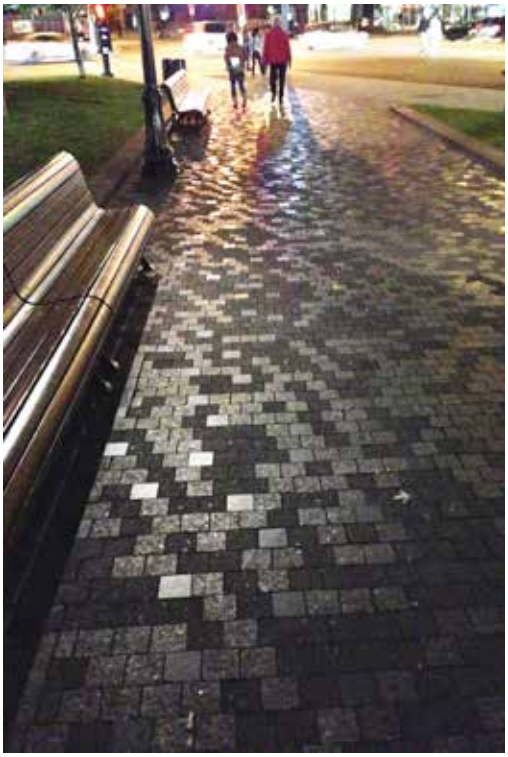
- Very pedestrian friendly
- Provides sense of place
- Unique
- Slows traffic
- Easier to match replacement
- Best demonstrates objectives and principles of University District
- Pavers to be a non-slippery surface and compatible with snow and ice removal

SURFACING – SIDEWALKS

CAST-IN-PLACE CONCRETE

- Pedestrian friendly
- Provide pattern unique to University District

SURFACING – SIDEWALKS

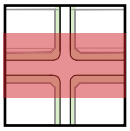


GRANITE PAVERS

- Very pedestrian friendly
- Provides sense of place
- Very Unique
- Easier to match replacement
- Demonstrates objectives and principles of University District
- Potential to utilize granite pavers as an accent trim
- Potential for highlighting areas at night with a variety of surface textures and reflectivity
- Pavers to be a non-slippery surface and compatible with snow and ice removal

SURFACING – SIDEWALKS

SUMMARY



PRIMARY URBAN

CONCRETE PAVERS

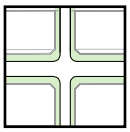
- Pavers are recommended as the primary surfacing material for the sidewalks.

POURED-IN-PLACE

- Coloured concrete with additional jointing is recommended as an edger or divider to retain areas of pavers.

GRANITE PAVERS

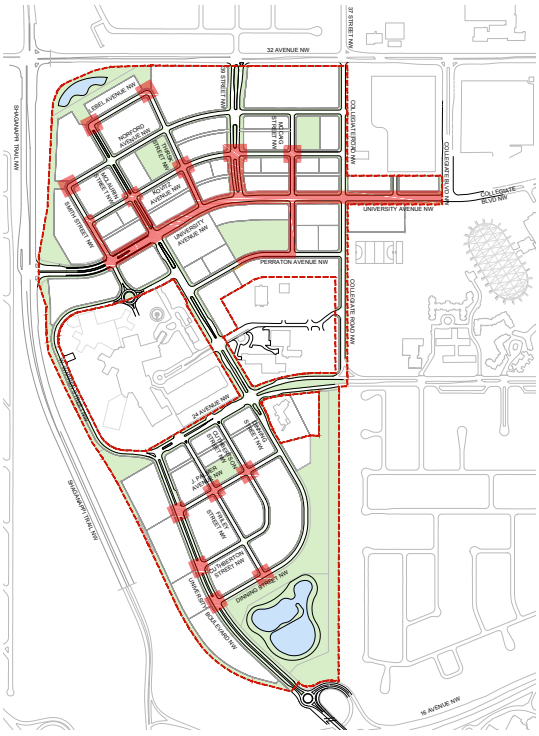
- Potential to be used as an accent trim or to define special areas.



RESIDENTIAL URBAN

STANDARD POURED-IN-PLACE CONCRETE

- Recommended on all remaining residential streets.



ADHERENCE TO:

- ☑ MDP/CTP PRINCIPLES
- ☑ UNIVERSITY DISTRICT MASTER PLAN
- ☑ STREETSCAPE PRINCIPLES

SURFACING – SIDEWALKS

PAVER TYPE:
VS-5

MANUFACTURER:
Expocrete / Oldcastle
www.expocrete.com

MANUFACTURING LOCATION:
Balzac, Alberta

SPECIFICATIONS:

300 x 300 x 108mm

150 x 300 x 108mm

MATERIAL QUALITY AND BENEFITS:
See streets surfacing section

SAMPLE INSTALLATIONS:
Calgary: The Shaw building off Barlow Trail, Taylor Library at the U of C, 24th Street at the EEL Building bus turn-around at the U of C, Peter Lougheed Hospital.

Edmonton: Jasper Avenue.

Vancouver: UBC campus.

Replacement Costs:

Pavers in Roads including base course-$250/m2

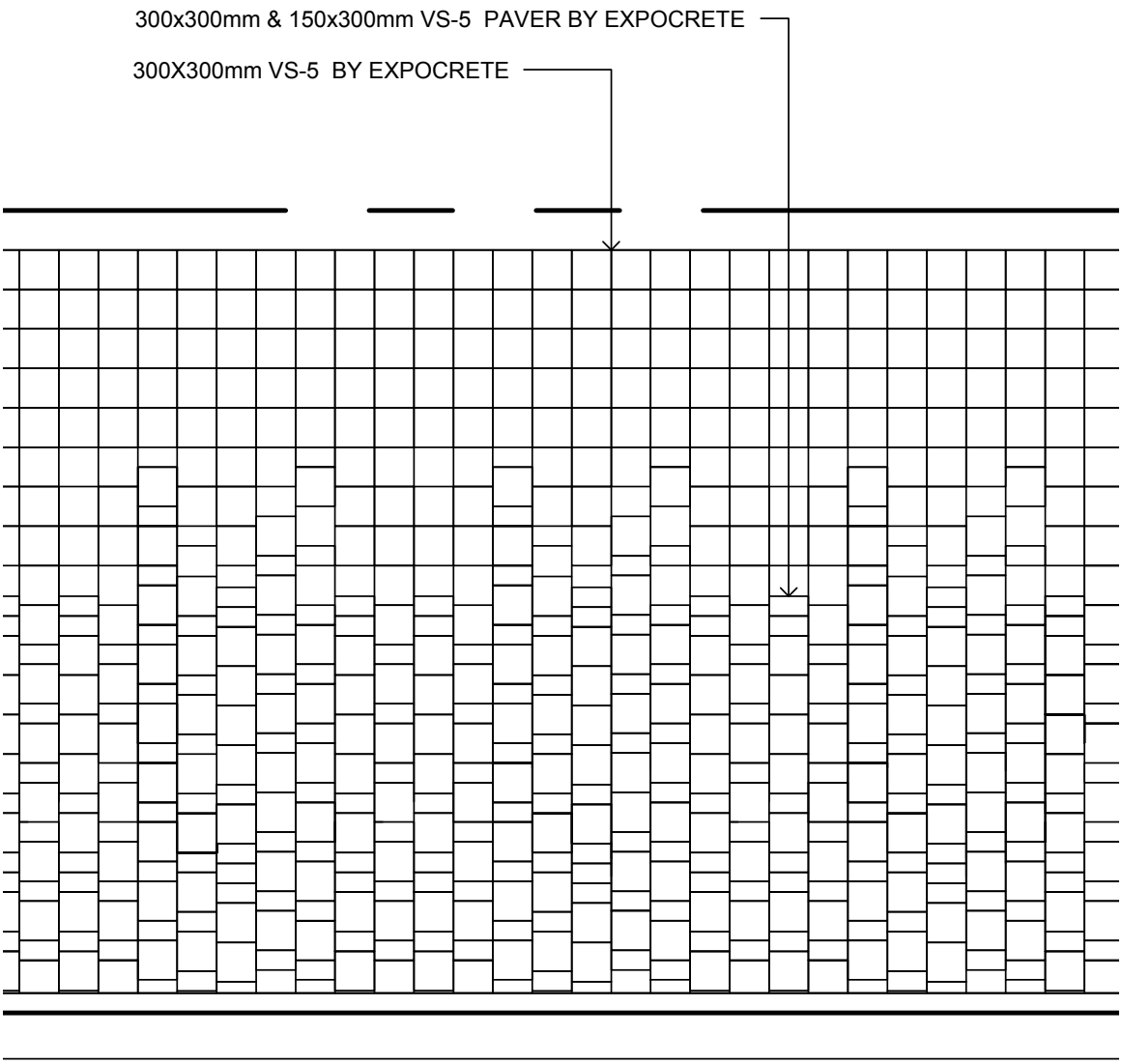
SURFACING – SIDEWALKS

PAVER TYPE:
VS-5

MANUFACTURER:
Expocrete / Oldcastle
www.expocrete.com

PAVER PATTERNS:
Paver patterns to be coordinated with engineering layout and detail specifications.

Paver patterns to be designed in conjunction with street furniture, tree grate and tree planting requirements.



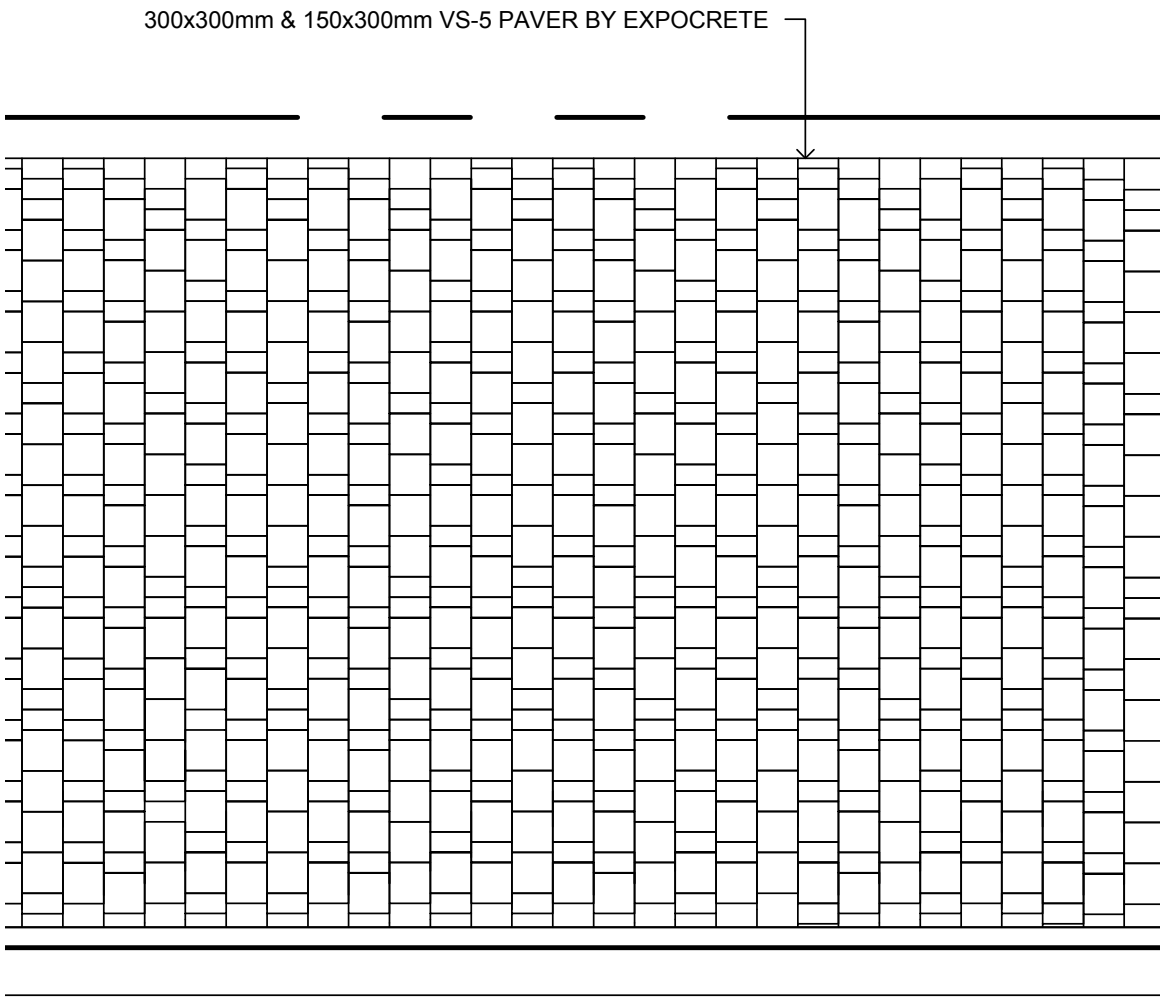
SURFACING – SIDEWALKS

PAVER TYPE:
VS-5

MANUFACTURER:
Expocrete / Oldcastle
www.expocrete.com

PAVER PATTERNS:
Paver patterns to be coordinated with engineering layout and detail specifications.

Paver patterns to be designed in conjunction with street furniture, tree grate and tree planting requirements.



SURFACING – SIDEWALKS

ALTERNATIVE PAVER TYPE:
Broadway

MANUFACTURER:
Barkman Concrete
www.barkmanconcrete.com

MANUFACTURING LOCATION:
Winnipeg, Manitoba

SPECIFICATIONS:

150 x 300 x 100mm

300 x 300 x 100mm

300 x 600 x 100mm

SURFACING – SIDEWALKS

ALTERNATIVE PAVER TYPE:

Broadway

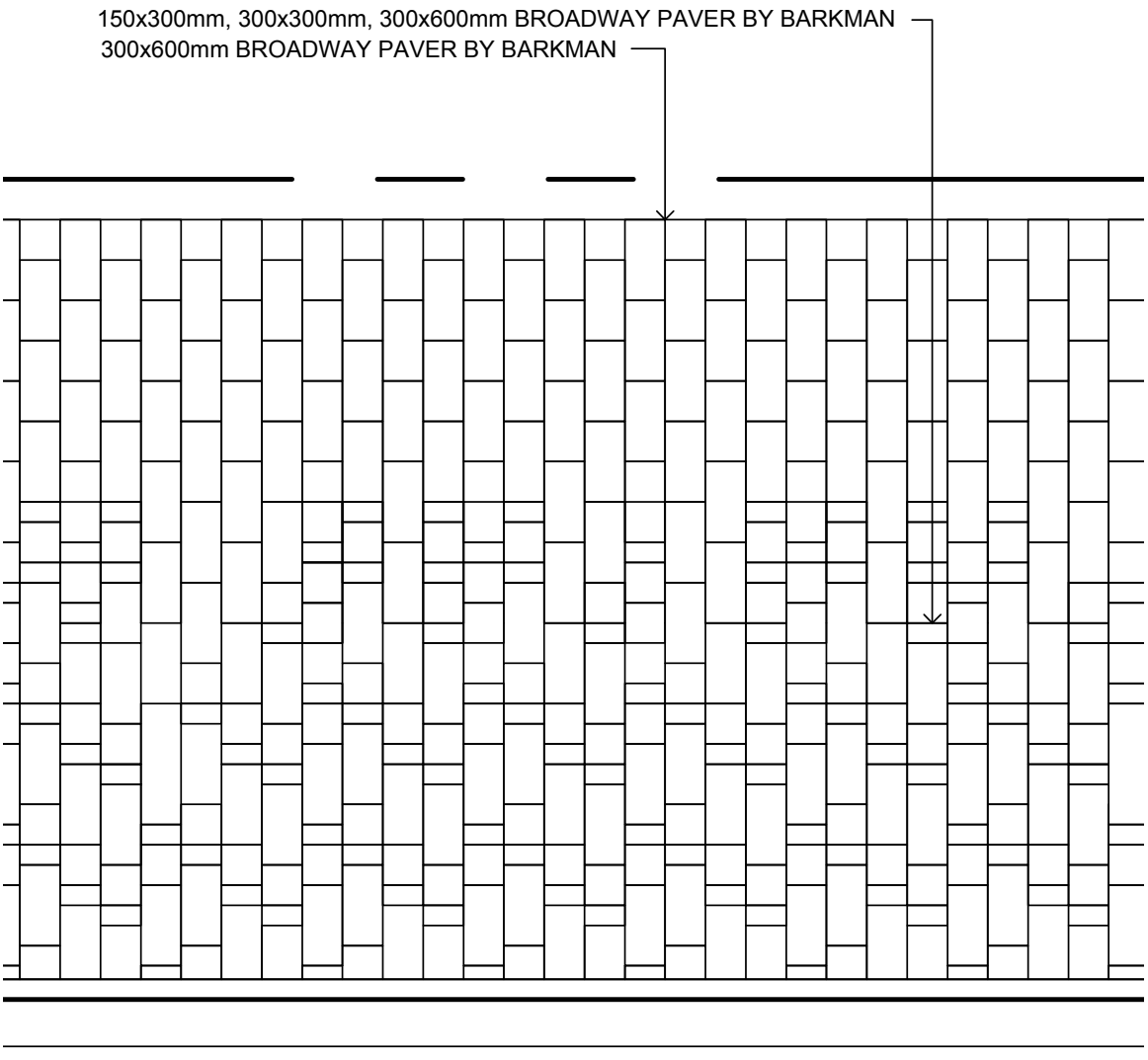
MANUFACTURER:

Barkman Concrete
www.barkmanconcrete.com

PAVER PATTERNS:

Paver patterns to be coordinated with engineering layout and detail specifications.

Paver patterns to be designed in conjunction with street furniture, tree grate and tree planting requirements.



SURFACING – SIDEWALKS

ALTERNATIVE PAVER TYPE:

Broadway

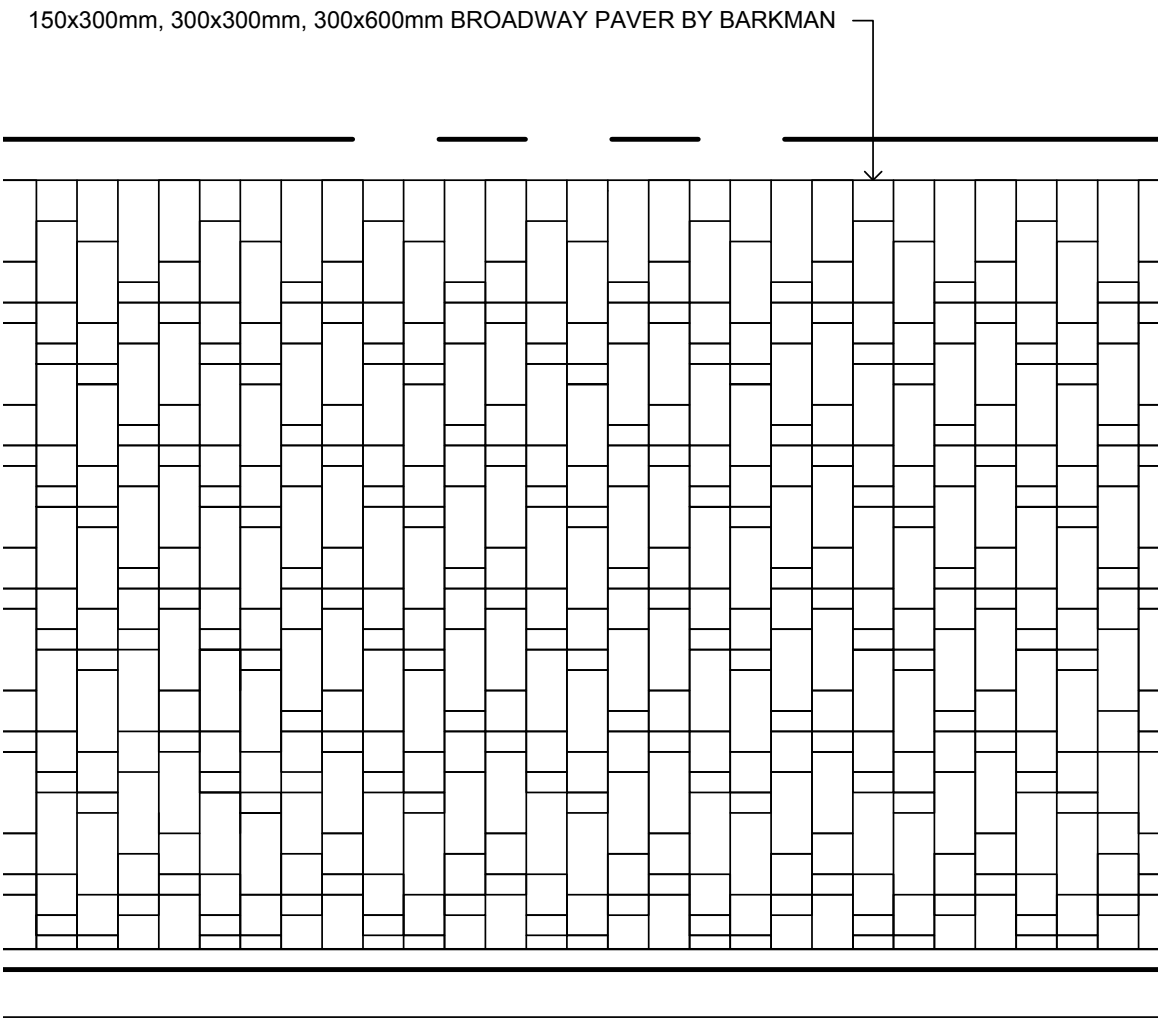
MANUFACTURER:

Barkman Concrete
www.barkmanconcrete.com

PAVER PATTERNS:

Paver patterns to be coordinated with engineering layout and detail specifications.

Paver patterns to be designed in conjunction with street furniture, tree grate and tree planting requirements.



SURFACING – SIDEWALKS

PAVER TYPE:

All Sidewalk Concrete Pavers

COLOURS:

- Pavers in grey tones have a very contemporary and timeless characteristic.
- This colour range does not tend to change colour over time.

LIGHT GREY

MEDIUM GREY

DARK GREY

SURFACING – SIDEWALKS

PAVER TYPE:
All Sidewalk Concrete Pavers

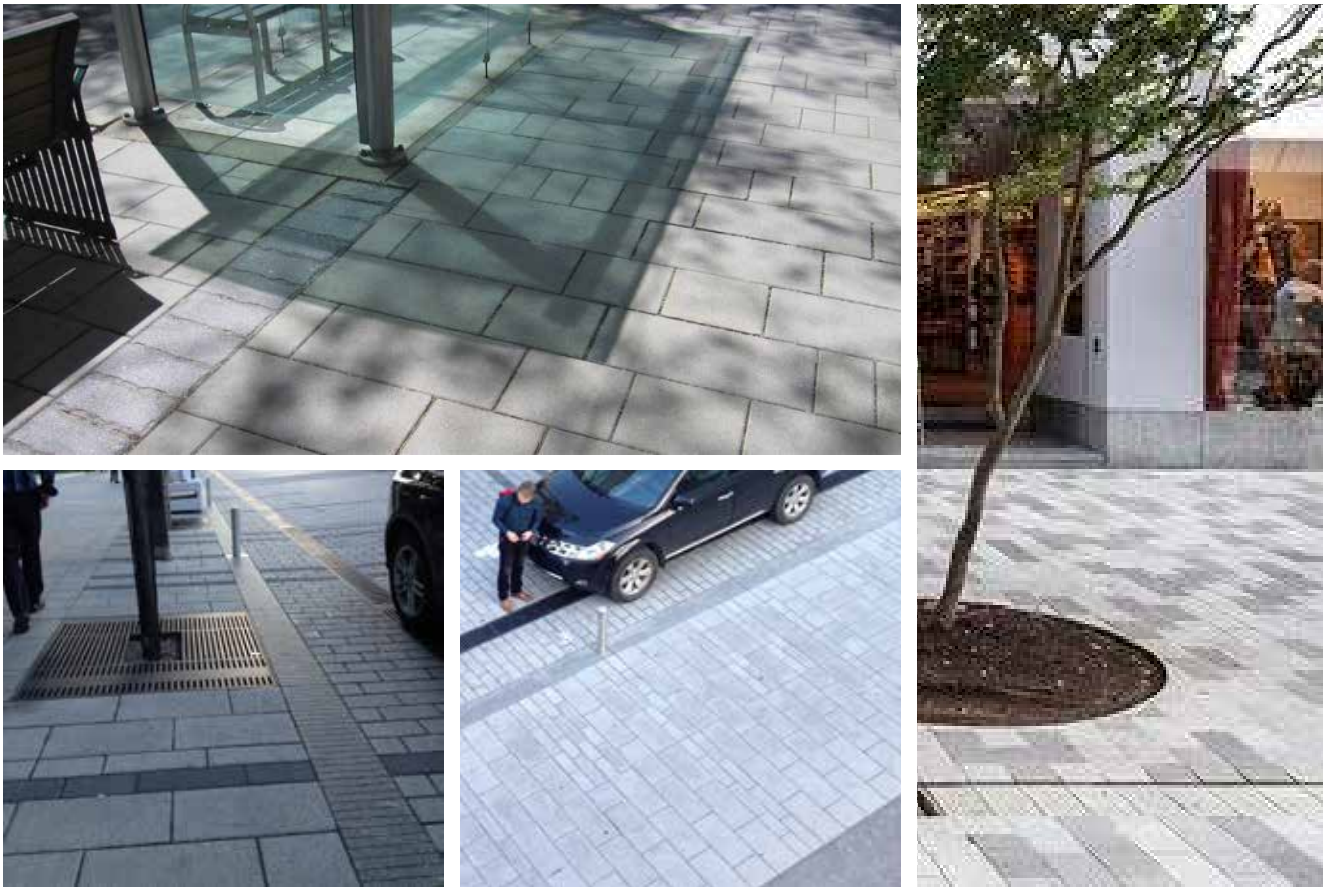
COLOURS PATTERN:
Careful blend of colours and paver pattern to create a timeless contemporary feel.





CONTEMPORARY SUBTLE MIX

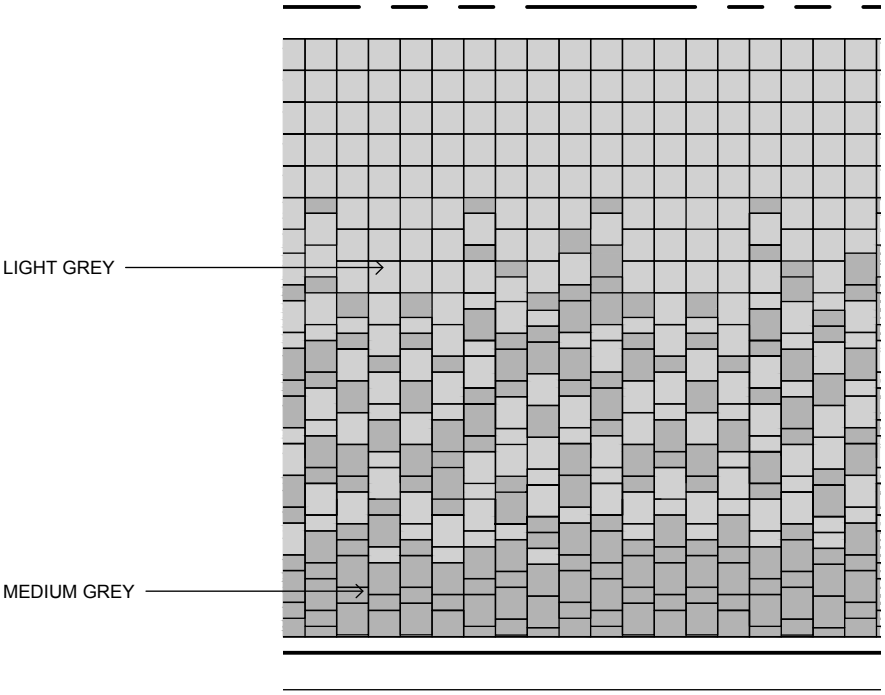
SURFACING – SIDEWALKS



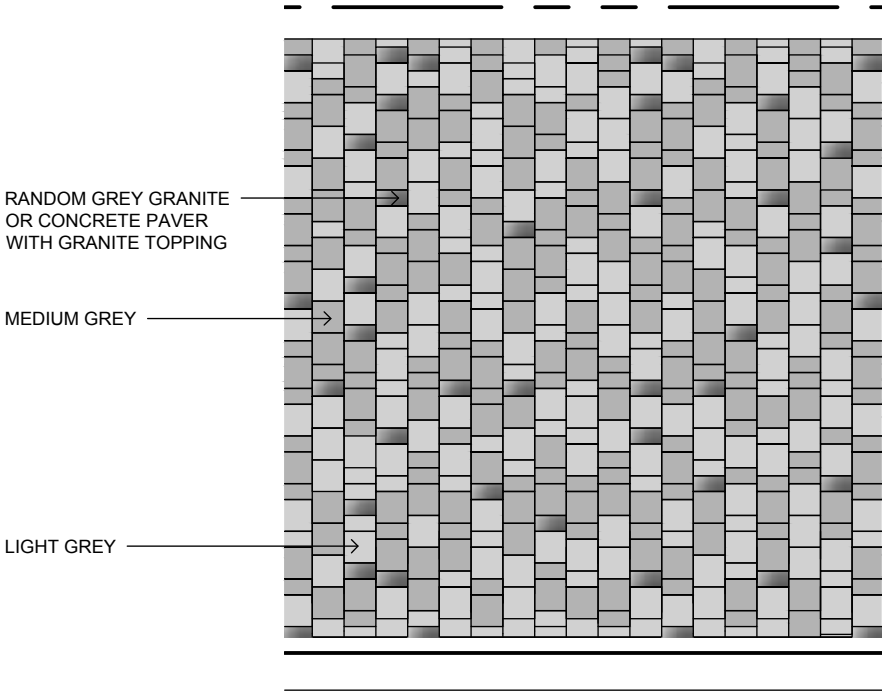
SINGLE COLOUR WITH DETAIL EDGES OR SMALLER DETAIL AREAS

SURFACING – SIDEWALKS

COLOUR PATTERN:
Sample colour layout



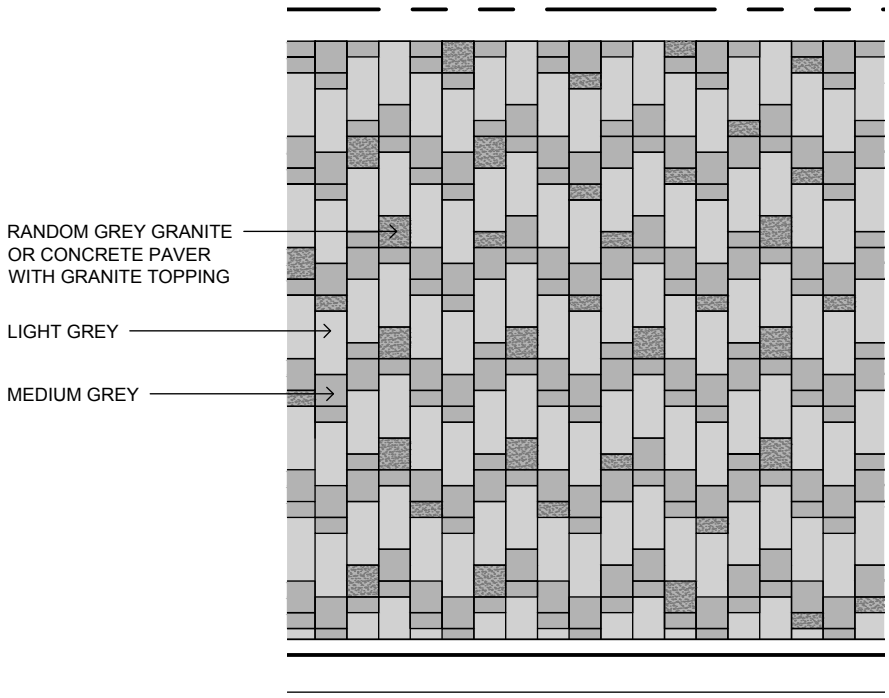
COLOUR PATTERN:
Sample colour layout



SURFACING – SIDEWALKS

COLOUR PATTERN:

Sample colour layout



SURFACING – SIDEWALKS

PAVER TYPE:
Granite Pavers

MANUFACTURER:
Various Suppliers

MANUFACTURING LOCATION:
Various Locations

SPECIFICATIONS:
Match paver thickness and sizes to concrete pavers to provide complete interchangeability.

SURFACING – SIDEWALKS

PAVER TYPE:
Granite Pavers

COLOURS:
Pavers with a careful blend of charcoal colours mixed to provide a contemporary feel.

Potential for highlighting areas at night with a variety of surface textures and reflectivity.

Paver colours to complement concrete paver colour range.

CROSSWALKS

Crosswalks are a critical part of the vehicle and pedestrian network. Special paving treatments communicate to individual users that the crosswalk is part of the pedestrian space and not an encroachment by pedestrians into the roadway. Paving, texture and colour treatments are especially important to make pedestrians more comfortable crossing the roadway. Enhanced crosswalk paving can also make motorists more aware of pedestrian activity.

Curb extensions or bulbs at the intersections provide shorter crossing distances for pedestrians. The street corners also provide increased pedestrian space and opportunity for social interaction through the placement of benches and site furnishings as well as a safe refuge while waiting to cross the street.

CROSSWALKS STREET LAYOUT

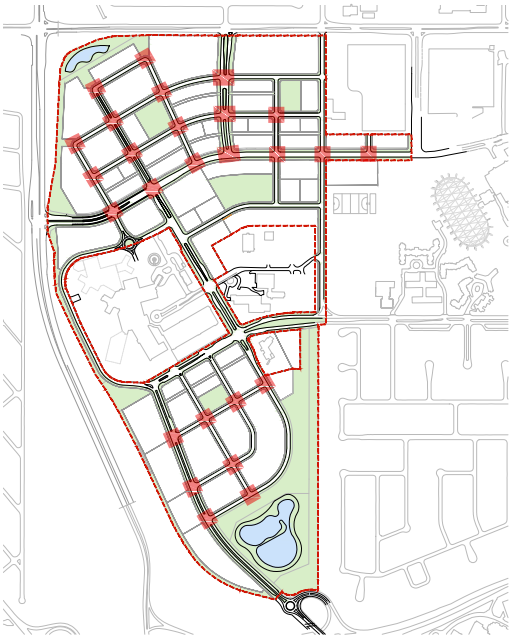
Streetscape Geometry/ Layout	City Approval	Benefits	Limitations	Cost Implications	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Street Sections - as per outline plan	Approved	• Based on Complete Streets		None	High	N/A	High	High	
Streetscape Geometry/ Layout									
Protected Parking – Bulbs at corners	Approved elsewhere in city	• Pedestrian oriented • Narrower pedestrian crossing • Larger corners promote gathering spaces • Definition to parking space extent • Traffic calming	• Potential removal costs as per High Street future phasing • More difficult access for bus stops – confirm initial number of stops • Vehicle turning radius may reduce concept at some intersections • Not as friendly for turning lanes at intersections	$ –installation Med-High -potential removal costs	★★★★★	N/A	★★★★	★★★★	1
Non-Protected Parking – No bulbs at corners	Standard	• More auto friendly for turning lanes at intersections • Improved traffic volume • Better flow for buses, reduced area for bus stops • No potential removal costs / risks	• No traffic calming – increase in traffic speed • Less pedestrian oriented • Wider pedestrian crossing • Less pedestrian gathering space • Not unique, same as everywhere else	$	★ (depending on materials used on crosswalks)	N/A	★	★	2

Note: Comparative ranking is a priority based on a review of the cost implications vs. an average of the importance to principles.

$ Low Cost = High Ranking
$$$$$ High Cost = Low Ranking

★ Low Importance = Low Ranking
★★★★★ High Importance = High Ranking

CROSSWALKS – SURFACING



BULBS AT CORNERS

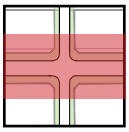
- Pedestrian friendly
- Narrower pedestrian crossing
- Larger corners promote gathering spaces
- Definition to parking space extent
- Traffic calming

ADHERENCE TO:

☑ **MDP/CTP PRINCIPLES**

☑ **UNIVERSITY DISTRICT MASTER PLAN**

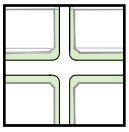
☑ **STREETSCAPE PRINCIPLES**



PRIMARY URBAN

CURB BULBS AT INTERSECTIONS

- Bulbs at all intersection are recommended where possible.
- All bulb-outs are contingent upon engineering design and review.
- Design for potential bulb removal to accommodate Stage Three development on High Street. See example on next page.
- Avoid placement of street furniture, tree planting and signage at corner bulb-outs to protect unobstructed pedestrian connections and intersection corners.

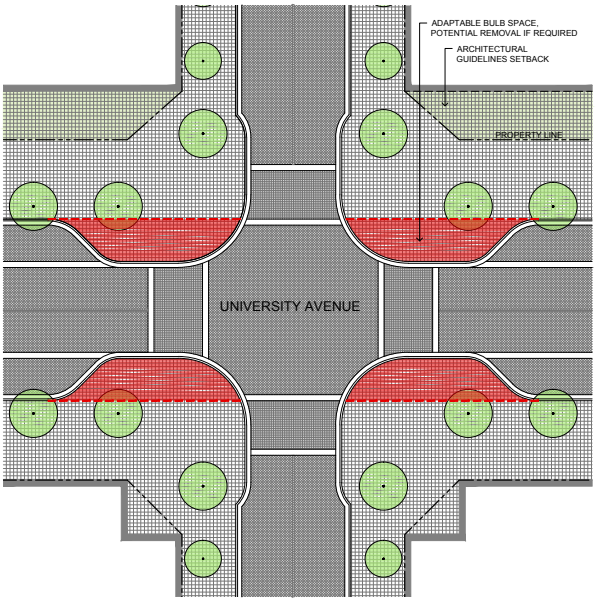


RESIDENTIAL URBAN

CURB BULBS AT INTERSECTIONS

- Bulbs at all intersection are recommended where possible.
- Avoid placement of street furniture, tree planting and signage at corner bulb-outs to protect unobstructed pedestrian connections and intersection corners.

CROSSWALKS – SURFACING



Concept graphic
Example: potential bulb removal to accommodate Stage Three development on High Street.

Surfacing - Crosswalks	City Approval	Benefits	Limitations	Cost Implications	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Crosswalks – Standard asphalt, no markings	Standard	• Ease of construction and approval	• Not pedestrian oriented • No sense of place • Not unique • Doesn't demonstrate objectives and principles of West Campus	$	★	★	★	★	4
Crosswalks – Painted Markings	Standard	• Somewhat pedestrian oriented • Somewhat slows traffic	• Wears off quickly • On-going yearly maintenance costs	$	★★	★	★	★	2
Crosswalks – Asphalt with thermal applied pattern	Previous City Approval	• Somewhat pedestrian oriented • Somewhat unique • Somewhat slows traffic • Lasts somewhat longer than painted	• Potential higher replacement costs • More difficult to match replacement • Tire tracks mark surfacing	$$	★★	★★	★★★	★★	2
Crosswalks – Standard poured-in-place	Previous City Approval	• Somewhat pedestrian oriented • Somewhat unique • Somewhat slows traffic	• Potential higher replacement costs • More difficult to match replacement	$$$	★★	★★	★★	★	5
Crosswalks – Coloured concrete, additional jointing	Previous City Approval	• Somewhat pedestrian oriented • Somewhat unique • Somewhat slows traffic	• Potential higher replacement costs • More difficult to match replacement • Tire tracks mark surface	$$$$	★★	★★	★★★	★★	7
Crosswalks – Patterned Concrete	Non-Standard	• Somewhat pedestrian oriented	• Non-authentic surface • Jointing and pattern are not complementary • Replacement is usually difficult and unsightly • Cracking usually conflicts with pattern • Uneven surfaces • Tire tracks mark surface	$$$$	★★	★	★	★	8
Crosswalks – Concrete pavers	Previous City Approval	• Pedestrian oriented • Provides sense of place • Unique • Slows traffic • Easier to match replacement • Demonstrates objectives and principles of West Campus	• Higher installation costs • Some surface marking by tire tracks	$$$$	★★★★	★★★★	★★★★★	★★★★★	1
Crosswalks – Granite pavers	Non-Standard	• Pedestrian oriented • Provides sense of place • Very Unique • Slows traffic • Easier to match replacement • Demonstrates objectives and principles of West Campus	• Very high installation costs	$$$$$$	★★★★	★★★★	★★★★★	★★★★★	6

CROSSWALKS – SURFACING

ASPHALT WITH THERMAL APPLIED PATTERN

- Pedestrian friendly
- Unique design
- Slows traffic

CROSSWALKS – SURFACING

CONCRETE PAVERS

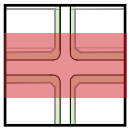
- Very pedestrian friendly
- Provides sense of place
- Unique
- Slows traffic
- Easier to match replacement
- Best demonstrates objectives and principles of University District
- Pavers to be a non-slippery surface and compatible with snow and ice removal

CAST-IN-PLACE CONCRETE

- Pedestrian friendly
- Unique design
- Slows traffic
- • Concrete surface to be a non-slippery surface and compatible with snow and ice removal

CROSSWALKS – SURFACING

SUMMARY



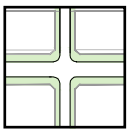
PRIMARY URBAN

CONCRETE PAVERS

- Recommended as the main surfacing material for the Primary Urban street crosswalks.
- See material recommended in streets surfacing and in appendix.

POURED-IN-PLACE

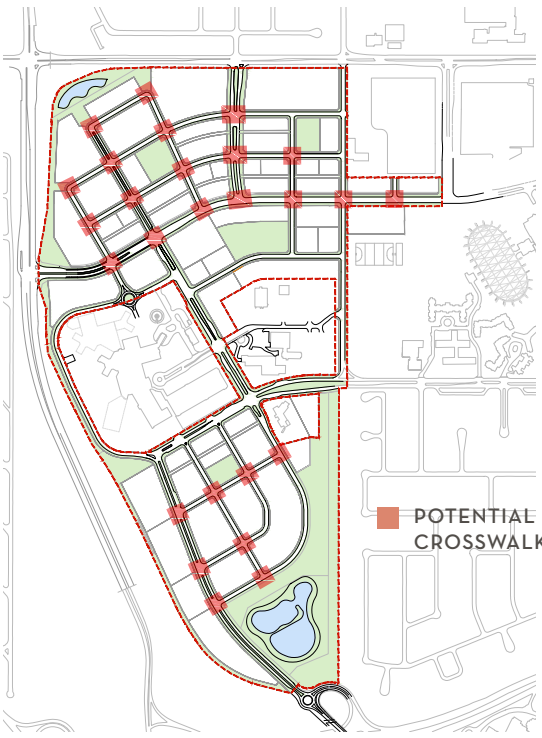
- Coloured concrete with additional jointing recommended as an edger or divider to retain areas of pavers.



RESIDENTIAL URBAN

ASPHALT WITH THERMAL APPLIED PATTERN

- Recommended on all remaining residential street crosswalks.



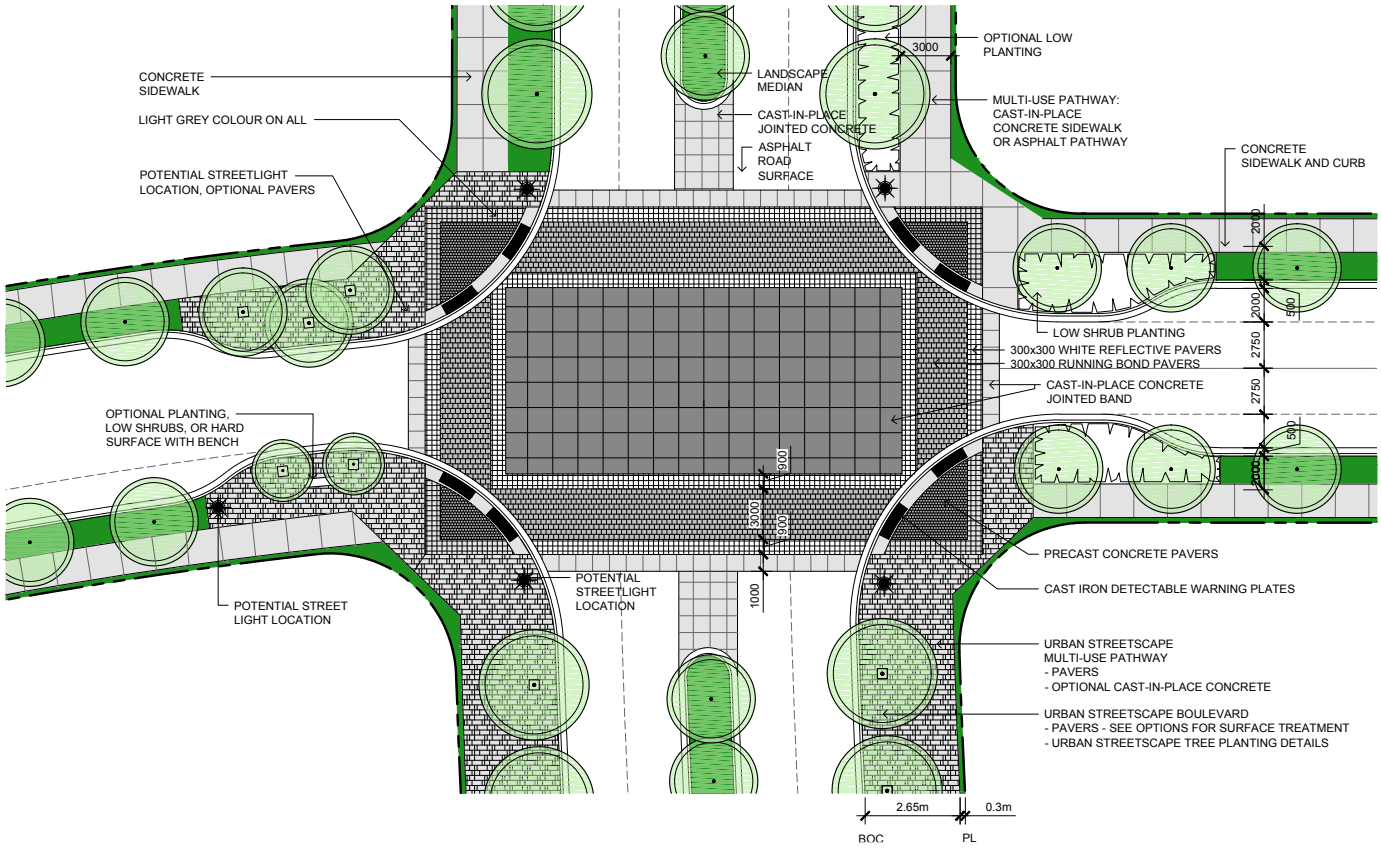
POTENTIAL UPGRADED CROSSWALK INTERSECTIONS

ADHERENCE TO:

- ☑ MDP/CTP PRINCIPLES
- ☑ UNIVERSITY DISTRICT MASTER PLAN
- ☑ STREETSCAPE PRINCIPLES

CROSSWALKS – SURFACING

INTERSECTION CONCEPT

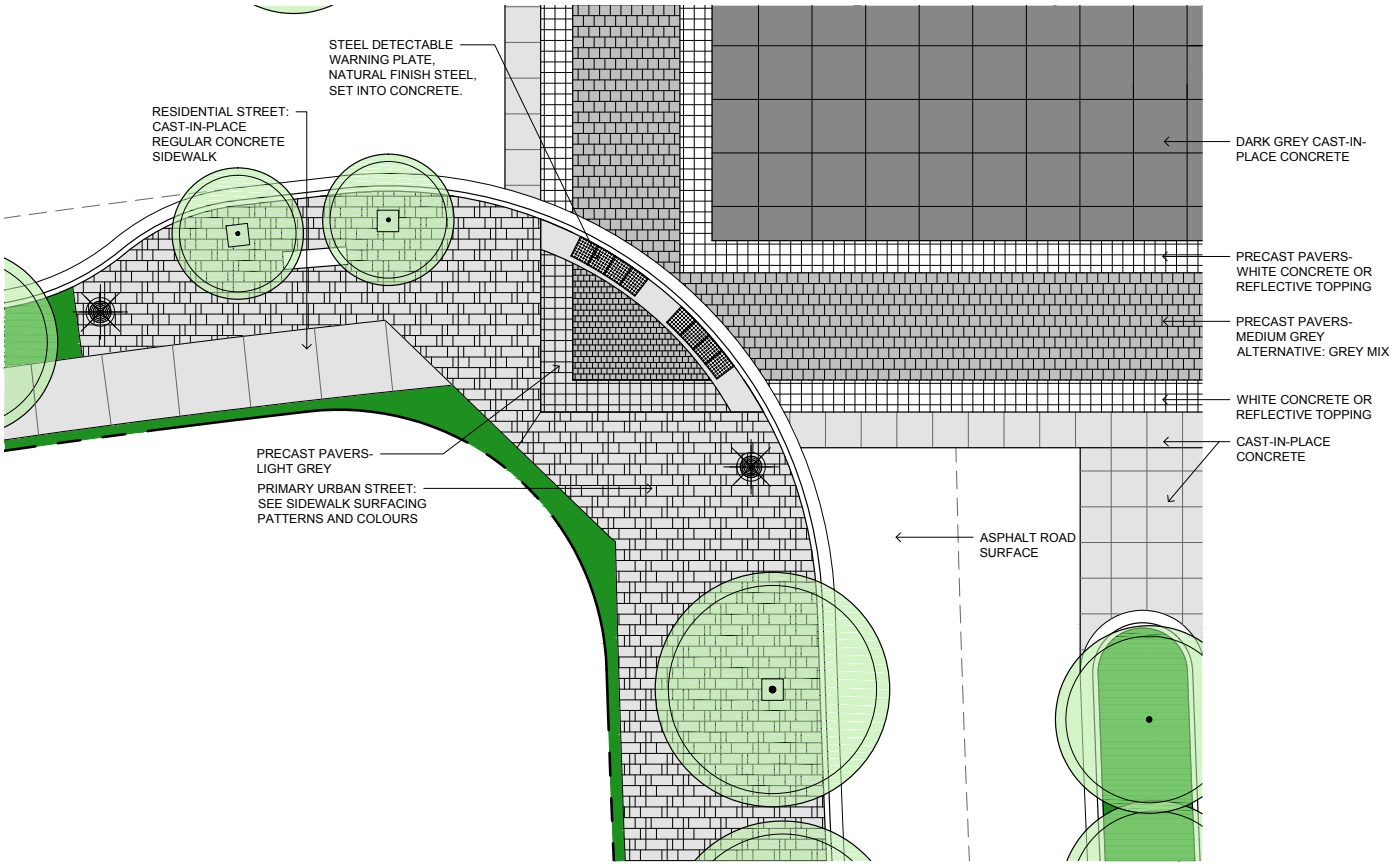


NOTES

- Avoid placement of street furniture, tree planting and signage at corners to protect unobstructed pedestrian connections and intersection corners.
- All boulevard planting to be coordinated with utility line assignment and utility alignments to ensure proper separations.
- All pavers and concrete surfaces are non-slip surfaces and suitable for rain and snowy conditions. Crosswalk design includes white reflective pavers to line the pedestrian surface which eliminates the slippery surface caused by the typical line painting.
- Crosswalks to be coordinated with signal locations where required.

CROSSWALKS – SURFACING

INTERSECTION CORNER CONCEPT



NOTES

- Avoid placement of street furniture, tree planting and signage at corners to protect unobstructed pedestrian connections and intersection corners.
- All boulevard planting to be coordinated with utility line assignment and utility alignments to ensure proper separations.
- All pavers and concrete surfaces are non-slip surfaces and suitable for rain and snowy conditions. Crosswalk design includes white reflective pavers to line the pedestrian surface which eliminates the slippery surface caused by the typical line painting.
- Crosswalks to be coordinated with signal locations where required.

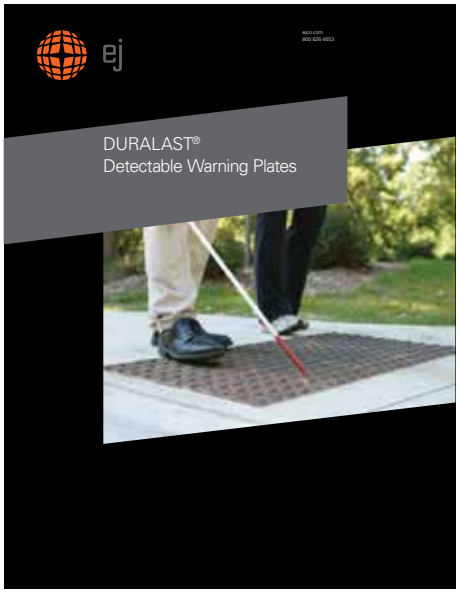
DURALAST DETECTABLE WARNING PLATES

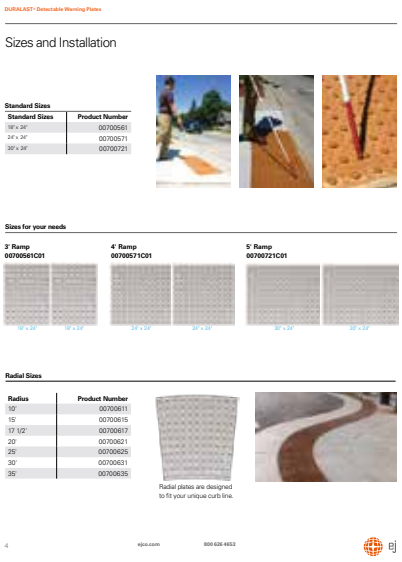
MANUFACTURER:

East Jordan Iron Works
www.ejco.com
Or equal and approved

MATERIAL QUALITY AND BENEFITS:

- Detectable warning plates are designed to fully comply with the current American Disabilities Act Accessibility Guidelines.
- Long-lasting cast iron warning plates withstand rigorous urban conditions such as snow plows, street cleaning machines and vehicular traffic. Cast iron is many times more durable than composite tile or precast concrete tactile pavers.
- Plates are embedded into concrete which prevents lifting.
- Cast iron plates in a natural finish is corrosion resistant, is maintenance free and minimizes any unnecessary environmental impacts. Cast iron is an environmentally responsible product that is completely recyclable after its useful life.
- Plates are available in several radial sizes which are designed to fit into the curb line radius.




DURALAST® Detectable Warning Plates

Sizes and Installation

Standard Sizes

Standard Sizes	Product Number
18" x 24"	00700561
24" x 24"	00700571
30" x 24"	00700721

Sizes for your needs

3' Ramp 00700561C01 | 4' Ramp 00700571C01 | 5' Ramp 00700721C01

Radial Sizes

Radius	Product Number
10'	00700611
15'	00700615
17 1/2'	00700617
20'	00700621
25'	00700625
30'	00700631
35'	00700635

Radial plates are designed to fit your unique curb line.

4 ejco.com 800 626 4653

ii. Street lighting

Lighting is the key organizing streetscape element that defines the night-time visual environment in urban settings. The street lighting includes both the roadway and the pedestrian lighting in the public right-of-way. Lighting is an important element that bonds the urban fabric together, while helping to distinguish the identity of an individual district. Quality street lighting also defines a positive urban character and supports night-time activities which is especially important in Calgary's cold and dark winters.

Lighting should contribute in creating safe and aesthetically pleasing public spaces. The quality of visual information is critical for both traffic safety and pedestrian safety and security. The family of enhanced fixtures and light poles will contribute to a harmonious, uniform and coherent streetscape in the University District community.

Placement of individual items throughout the public/semi-public realm will be considered in order to protect unobstructed pedestrian connections and intersection corners

Street Lighting	City Approval	Benefits	Limitations	Cost Implications	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Street Lighting - Luminaire									
Standard Luminaire	Standard	• Ease of construction and approval • Potential for new standard LED luminaires available from City.	• Current standards not pedestrian oriented • No sense of place • Not unique • Doesn't demonstrate objectives and principles of West Campus	$	«	««««	«	«	2
Catalog Luminaire (Non-City Standard)	Previous City Approval	• Create a pedestrian oriented street • Present an unique sense of place		$$	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	1
Custom Luminaire	Non-Standard	• Create a pedestrian oriented street • Present an unique sense of place	• Potential high cost • Potential replacement and availability issues	$$$$$	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	3
Street Lighting - Light Pole									
Standard Light Pole	Previous City Approval	• Ease of construction and approval	• Not pedestrian oriented • No sense of place • Not unique • Doesn't demonstrate objectives and principles of West Campus	$	★	★★★★	★	★	3
Catalog Light Pole (Non-City Standard)	Previous City Approval	• Create a pedestrian oriented street • Present an unique sense of place		$$$$	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	1
Custom Light Pole	Non-Standard	• Create a pedestrian oriented street • Present an unique sense of place	• Potential high cost	$$$$	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	1
Street Lighting - Potential Combinations									
Catalog Light Pole with Catalog Luminaire				$$$	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	1
Custom Light Pole with Catalog Luminaire				$$$	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	1
Standard City of Calgary LED Luminaire with Catalog Light Pole or Custom Light Pole				$$$	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	Potential ★★★★★	1

Note: Comparative ranking is a priority based on a review of the cost implications vs. an average of the importance to principles.

$ Low Cost = High Ranking
$$$$$$ High Cost = Low Ranking

★ Low Importance = Low Ranking
★★★★★ High Importance = High Ranking

NOTE

Provide careful placement of all individual street lighting and site furnishing throughout the public realm in order to protect unobstructed pedestrian connections and intersection corners.

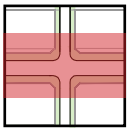
STREET LIGHTING

CATALOG STREETLIGHT

- Catalog light pole with
- Catalog luminaire

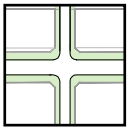
CHARACTERISTICS

- Present and define a sense of place to University District Community
- Create a pedestrian friendly ambiance
- Unique design
- Demonstrate objectives and principles of University District
- Adhere to Dark Sky Policy
- Coordinate with City of Calgary approved LED luminaires
- Street light pole to provide flexibility and ease of attachment for pole accessories



PRIMARY URBAN

Urban core area. Lighting design in this area to define sense of place for University District community.

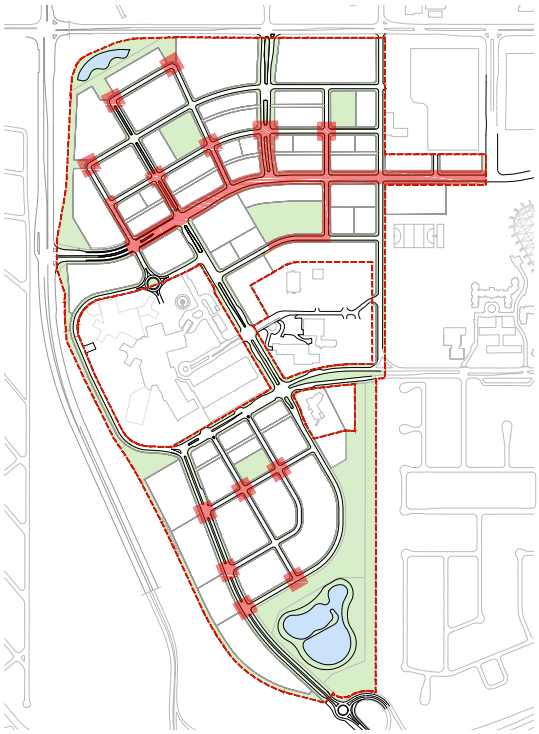


RESIDENTIAL URBAN

Extend elements of primary urban street lighting into residential areas for consistency in design and continuity of streetscape elements.

ADHERENCE TO:

- ☑ MDP/CTP PRINCIPLES
- ☑ UNIVERSITY DISTRICT MASTER PLAN
- ☑ STREETSCAPE PRINCIPLES



McGraw-Edison

DESCRIPTION

The Galleon™ LED luminaire delivers exceptional performance in a highly scalable, low-profile design. Patented, high-efficiency AccuLED Optics™ system provides uniform and energy conscious illumination to walkways, parking lots, roadways, building areas and security lighting applications. IP66 rated and UL/cUL Listed for wet locations.

Catalog #		Type	
Project			
Comments		Date	
Prepared by			

SPECIFICATION FEATURES

Construction
Extruded aluminum driver enclosure thermally isolated from Light Squares for optimal thermal performance. Heavy-wall, die-cast aluminum end caps enclose housing and die-cast aluminum heat sinks. A unique, patent pending interlocking housing and heat sink provides scalability with superior structural rigidity. 3G vibration tested. Optional tool-less hardware available for ease of entry into electrical chamber. Housing is IP66 rated.

Optics
Patented, high-efficiency injection-molded AccuLED Optics technology. Optics are precisely designed to shape the distribution maximizing efficiency and application spacing. AccuLED Optics create consistent distributions with the scalability to meet customized application requirements. Offered standard in 4000K (+/- 275K) CCT 70 CRI. Optional 6000K CCT and 3000K CCT.

Electrical
LED drivers are mounted to removable tray assembly for ease of maintenance. 120-277V 50/60Hz, 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Standard with 0-10V dimming. Shipped standard with Eaton proprietary circuit module designed to withstand 10kV of transient line surge. The Galleon LED luminaire is suitable for operation in -40°C to 40°C ambient environments. For applications with ambient temperatures exceeding 40°C, specify the HA (High Ambient) option. Light Squares are IP66 rated. Greater than 90% lumen maintenance expected at 60,000 hours. Available in standard 1A drive current and optional 530mA and 700mA drive currents.

Mounting
STANDARD ARM MOUNT: Extruded aluminum arm includes internal bolt guides allowing for easy positioning of fixture during assembly. When mounting two or more luminaires at 90° and 120° apart, the EA extended arm may be required. Refer to the arm mounting requirement table. Round pole adapter included. For wall mounting, specify wall mount bracket option. 3G vibration rated. QUICK MOUNT ARM: Arm is bolted directly to the pole and the fixture slides onto the quick mount arm and is secured via a single fastener, facilitating quick and easy installation. The versatile, patent pending, quick mount arm accommodates multiple drill patterns ranging from 1-1/2" to 4-7/8". Removal of the door on the quick mount arm enables wiring of the fixture without having to access the driver compartment. A knock-out enables round pole mounting.

Finish
Housing finished in super durable TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Heat sink is powder coated black. Standard colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available.

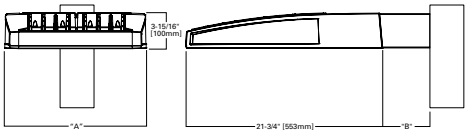
Warranty
Five-year warranty.

GLEON
GALLEON LED

1-10 Light Squares
Solid State LED

AREA/SITE LUMINAIRE

DIMENSIONS



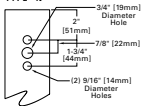
DIMENSION DATA

Number of Light Squares	"A" Width	"B" Standard Arm Length	"B" Optional Arm Length [1]	Weight with Arm (lbs.)	EPA with Arm [2] (Sq. Ft.)
1-4	15-1/2" (394mm)	7" (178mm)	10" (254mm)	33 (15.0 kgs.)	0.96
5-6	21-5/8" (549mm)	7" (178mm)	10" (254mm)	44 (20.0 kgs.)	1.00
7-8	27-5/8" (702mm)	7" (178mm)	13" (330mm)	54 (24.5 kgs.)	1.07
9-10	33-3/4" (857mm)	7" (178mm)	16" (406mm)	63 (28.6 kgs.)	1.12

NOTES: 1. Optional arm length to be used when mounting two fixtures at 90° on a single pole. **2.** EPA calculated with optional arm length.

DRILLING PATTERN

TYPE "N"



CERTIFICATION DATA
UL/cUL Wet Location Listed
ISO 9001
LM79 / LM80 Compliant
3G Vibration Rated
IP66 Rated
DesignLights Consortium™ Qualified*

ENERGY DATA
Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120V-277V 50/60Hz
347V & 480V 60Hz
-40°C Min. Temperature
40°C Max. Temperature
50°C Max. Temperature (HA Option)

EATON
Powering Business Worldwide

*www.designlights.org

TD500020EN
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Mounting Options

Occupancy Sensor
The optional motion sensor reduces energy use for site lighting applications.

Mast Arm Adapter
An optional cast aluminum mast arm adapter secures fixture head to nominal 2" (2-3/8" O.D. pipe size) horizontal steel tenon arm.

Wall Mount Bracket
An optional wall-mount plate is secured to wall by four lag bolts (supplied by others).

FIXTURE:
Gleon Galleon LED

MANUFACTURER:
McGraw-Edison
www.cooperindustries.com

LUMFIX SMART POLE

MANUFACTURER:

Lumca
www.lumca.com
Ville de Quebec, Quebec

MATERIAL QUALITY AND BENEFITS:

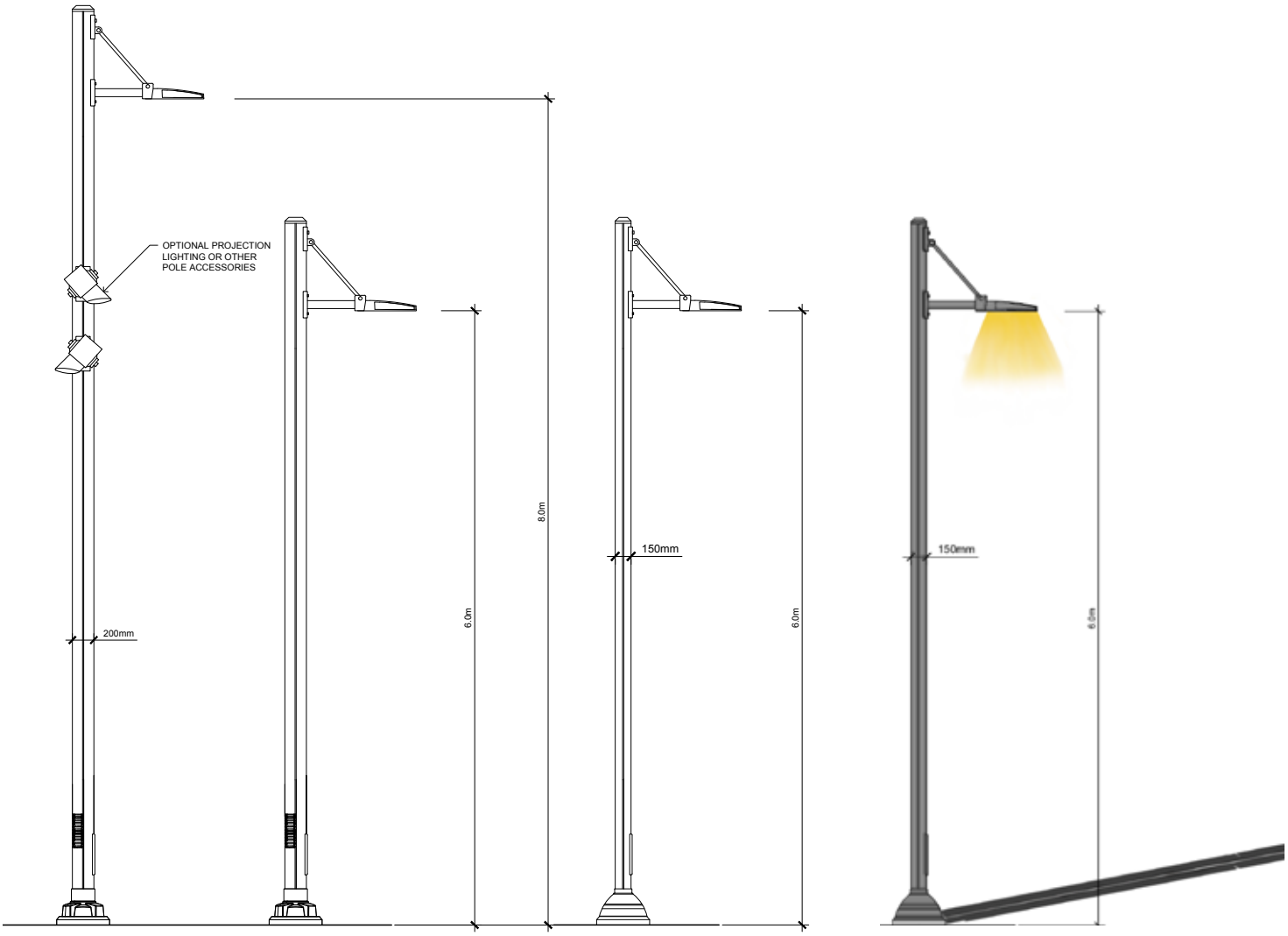
- The rail system of the LumFix pole allows for adjustable height for multiple accessories. It eliminates the primitive straps that are typically used to attach miscellaneous urban elements to a streetlight pole which damage the pole surface and are aesthetically unattractive. Using standard hardware, this unique and versatile system has been designed to install accessories quickly and securely. All hardware components are stainless steel.
- The cast aluminum pole is corrosion resistant and relatively maintenance free. Aluminum has a longer life than steel or fiberglass poles.
- The cast aluminum allows for more flexible design such as the flexible rail system. This allows for curved shapes and complex cross-sections to help design a signature project. Aluminum extruded poles like the LumFix have a better strength to weight ratio than a standard cast aluminum pole.
- The cast aluminum pole is lighter than a steel pole which allows for an easier and cost efficient installation.
- The one step surface pre-treatment organic system called Plaforization, exceeds the highest standard of the lighting industry with the quality of the finish and the ASTM standard for resistance to UV rays, salt spray and humidity. The powder coat finish offers a quality finish as well as an outstanding resistance to shock and is far superior to liquid paint. Combining the Plaforization process with a powdercoat finish creates a superior salt spray resistant surface.
- Aluminum is 100% recyclable. The aluminium melting temperature is low which saves energy and reduces emissions.

REPLACEMENT COST:

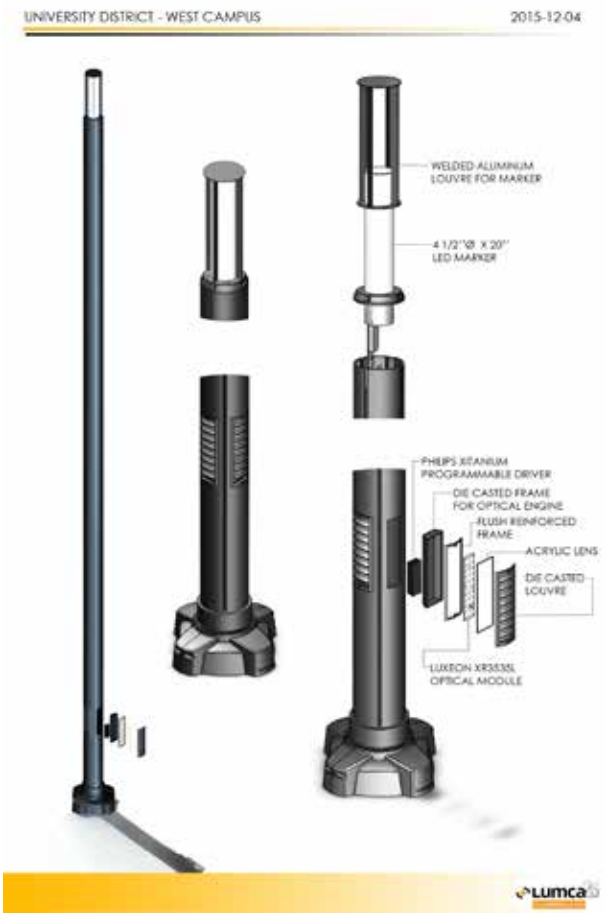
- 200mm diameter, 7.62m pole with no attachment options. $4,250.

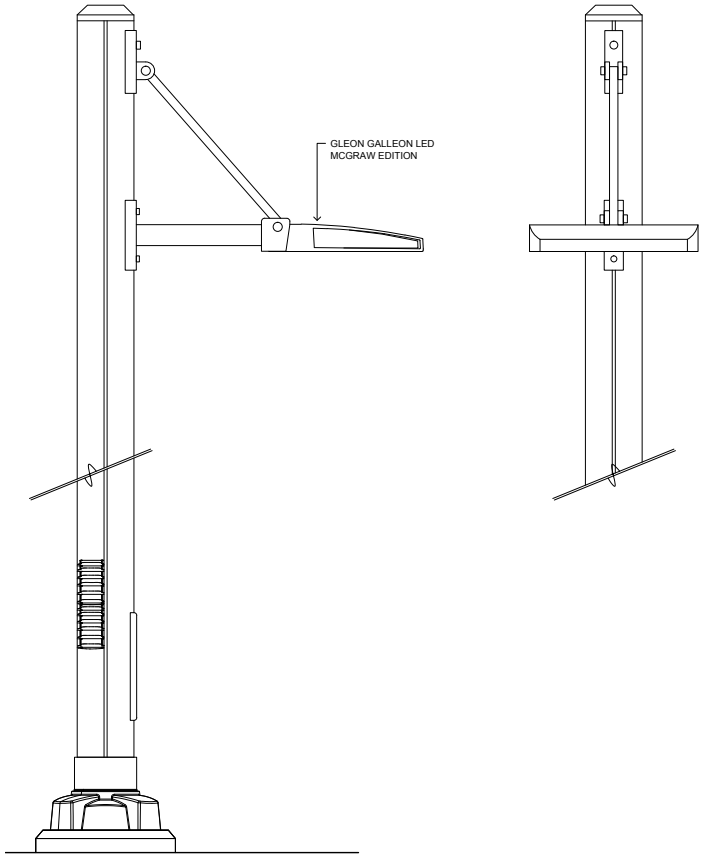
STREET LIGHT

Lumfix Smart Pole
Gleon Galleon Light Fixture



STREET LIGHT POLE





OTHER RECOMMENDATIONS

- These features are recommended as additional features to the street lighting fixtures and poles to create a unique sense of place.
- All additional features to be coordinated with the overall design to provide a continuity of streetscape elements.
- Review current City standards for existing required lighting levels. Review light levels from adjacent building lighting and potential for reduced street lighting levels.
- Review potential for low level sidewalk lighting to reduce required street lighting levels.

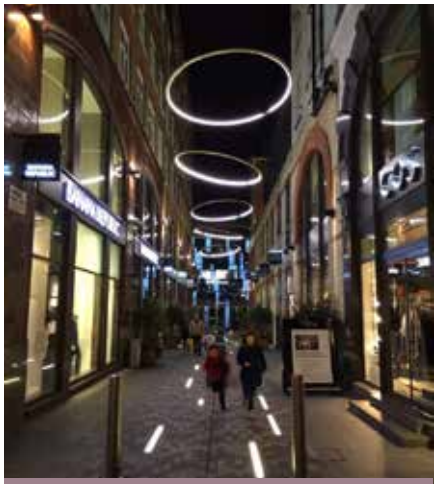
UNDER BENCH LIGHTING

LOW LEVEL LIGHTING

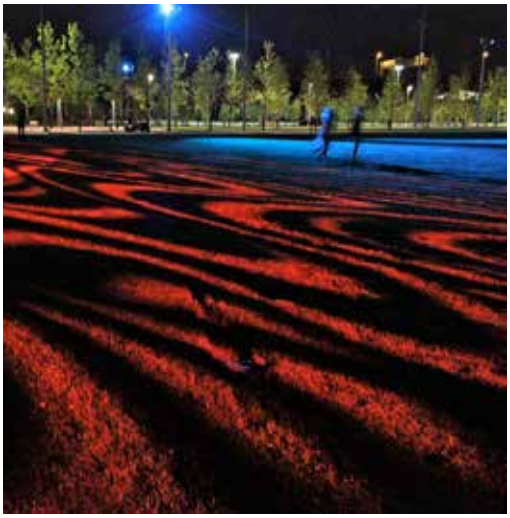
BOLLARD WARNING LIGHTING

PROJECTION LIGHTING FROM LIGHT POLES

OUTLETS FOR SEASONAL STREET TREE LIGHTING



SPECIALTY DECORATIVE LIGHTING



OPTIONS:
Projection lighting on sidewalk surfaces from street light poles

MANUFACTURER:
Various

OPTIONS:

Low level lighting at sidewalk

MANUFACTURER:

Various

COMMENTS:

- Lighting under benches.
- Low level lighting as an integral part of the street light pole.
- Additional low level lighting between street lights coordinated with street light pole design.
- Also low level lighting integral to street light pole.

OPTIONS:

Outlets for seasonal street tree lighting and specialty decorative lighting

iii. Street Furniture

Street furnishings are designed to provide amenities for pedestrians and fulfill many needs in a public place. Street furniture includes transit shelters, benches, sign posts, and litter/recycling containers and these street furnishings must be well-designed to serve their purpose, contribute positively to the appearance of the public realm, and be adaptable to the various streetscape conditions in the community.

Street furnishings announce that pedestrians of all types are welcome and that the street is a comfortable and vibrant place to be. These amenities provide a functional service to the pedestrian and provide visual detail that makes a place comfortable and interesting. The elements should be of high quality in both design and materials. The street furniture elements should be designed to work together and also be functional, adaptable, incorporate sustainability features and help to define the urban form and scale of the streetscape. Street furniture should be consistent and coordinated in design, materials, colors and styles that will reinforce a local identity for University District. The placement and design of the elements should also be coordinated to avoid visual clutter.

Placement of individual items throughout the public/semi-public realm will be considered in order to protect unobstructed pedestrian connections and intersection corners.

COORDINATION OF STREETSCAPE FURNISHINGS TO PROVIDE DESIGN CONTINUITY

- Streetscape furniture to coordinate with street lighting design style and philosophy
- Provide continuity of streetscape elements
- Provide continuity of sense of place
- Also provide sustainable message and adhere to University District Urban Design Principles (Urban Design Principles are provided on page 124).
- Bus shelters and benches were ranked as the most important elements to establish a unique sense of place in the University District.

BENCH

BUS SHELTER

GUARDRAILS

SIGNAGE

SPECIALTY AND SEASONAL

GARBAGE AND RECYCLING

BICYCLE RACKS

BOLLARDS

MANHOLE COVERS

PLANTERS

STREET FURNITURE COMPONENTS

Street Furniture	City Approval	Benefits	Limitations	Cost Implications	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Bus Shelters									
Bus Shelters - Standard	Standard	• Standard replacement components readily available	• No unique sense of place	$	★	★★★	★	★	3
Bus Shelters - Catalog Non-Standard	Previous City Approval	• Create unique sense of space • Provide continuity of streetscape elements • Potential sustainability features such as solar panels • Coordination with LEED ND requirements for locations	• Insure standard replacement components are available	$$$	★★★★★	Required ★★★★★	★★★★★	★★★★★	1
Bus Shelters - Custom	Previous City Approval	• Create unique sense of space • Provide continuity of streetscape elements • Potential sustainability features such as solar panels • Coordination with LEED ND requirements for locations and local supply • Coordination with LEED ND requirements for locations and local supply	• Insure standard replacement components are available	$$$$	★★★★★	Required ★★★★★	★★★★★	★★★★★	2
Benches									
Benches - Standard	Standard	• Standard replacement components readily available	• No unique sense of place	$	★	★★★	★	★	3
Benches - Catalog Non-Standard	Previous City Approval	• Streetscape furniture to coordinate with street lighting design style and philosophy • Provide continuity of streetscape elements • Provide unique sense of place	• Insure standard replacement components are available	$$$	★★★★★	Required ★★★★★	★★★★★	★★★★★	1
Benches - Custom	Previous City Approval	• Streetscape furniture to coordinate with street lighting design style and philosophy • Provide continuity of streetscape elements • Provide unique sense of place • Coordination with LEED ND requirements for local supply	• Insure standard replacement components are available	$$$	★★★★★	Required ★★★★★	★★★★★	★★★★★	1

Note: Comparative ranking is a priority based on a review of the cost implications vs. an average of the importance to principles.

$ Low Cost = High Ranking
$$$$$$ High Cost = Low Ranking

★ Low Importance = Low Ranking
★★★★★ High Importance = High Ranking

BUS SHELTERS

The following two options are recommended as viable alternatives.

CATALOG OPTION

- Present and define a sense of place to University District Community
- Create a pedestrian friendly environment
- Provide continuity of streetscape elements

CUSTOM OPTION

- Present and define a sense of place to University District Community
- Demonstrate objectives and principles of University District
- Provide sustainable message
- Potential landmark structure and exhibit University District Architectural Guidelines

BENCHES

OPTIONS:

Collection Internationale Series
EP 1690 Wooden Bench

MANUFACTURER:

Equiparc
www.equiparc.com

OPTIONS:

TANGO Series
EP 1980 Bench, with LED under Lighting

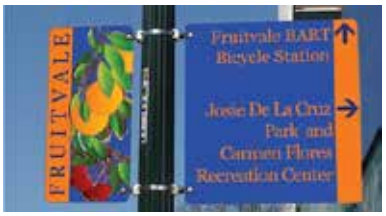
MANUFACTURER:

Equiparc
www.equiparc.com

SIGNAGE RECOMMENDATIONS

Coordination of street signage, wayfinding and regulation signage to provide design continuity.

- Present and define a sense of place to University District Community
- Foster a pedestrian friendly environment
- Provide continuity to the streetscape elements design
- Illustrate and define sustainable and community message



REGULATION SIGNAGE

- Keep proliferation of signs to a minimum
- Coordinate signage requirements with the City of Calgary

STREET SIGNAGE

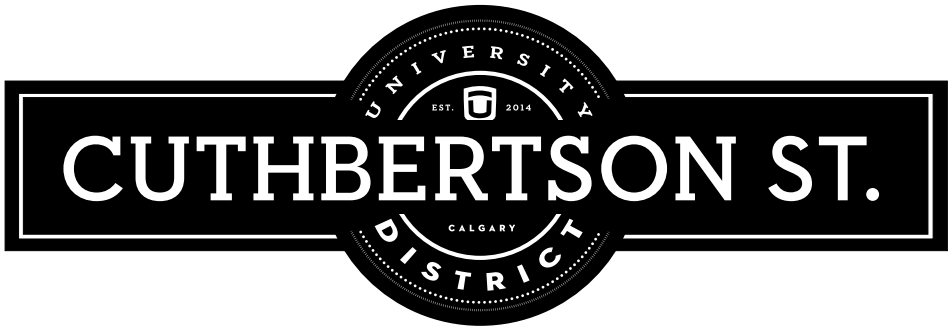
- Coordinate with street lighting
- Create sense of place for University District

INFORMATION SIGNAGE

- Coordinate wayfinding with street furniture and lighting design concept

STREET NAME SIGNS

- Create unique street name sign design to be used throughout University District area.
- Present and define a sense of place to University District community.
- Provide continuity to the streetscape elements design.



MANHOLE COVERS

- Create unique manhole cover design to be used throughout University District area.
- Present and define a sense of place to University District community.
- Provide continuity to the streetscape elements design.

MOVABLE PLANTERS

MANUFACTURER:
Local manufacturer

WASTE RECEPTACLE

MANUFACTURER:
Various

COMMENTS:
The exact model and receptacle size will be determined by the streetscape layout and receptacle location.

WASTE RECEPTACLE

Waste receptacle with solar powered compactor

MANUFACTURER:

Bigbelly
www.bigbelly.com
or Equal and approved

MANUFACTURING LOCATION:

Needham, Massachusetts

COMMENTS:

Larger receptacles in adjacent setbacks or parks and where there is a higher trash volume and an appropriate space for a larger installation.

BICYCLE RACK

MANUFACTURER:
Various

COMMENTS:
Exact model will be determined by the streetscape layout and available space required for bicycle parking.

BOLLARD

Complementary
Structura Furnishings

Duo Bollard

MANUFACTURER:

Structura Inc.
www.structura.com
or
Local manufacturer

COLOUR AND FINISHES

METAL

- Metal finishes to be in the grey to dark grey colour ranges.
- No rough textured finishes.

MERCURY/ METALLIC/LIGHT GREY

TITANIUM/ METALLIC/ MEDIUM GREY

MAGNESIUM/ METALLIC/MED-DARK GREY

WOOD

- Wood colour to be light to medium natural tones, semi-transparent, environmentally friendly, water proof stains such as C2 Guard Waterproofer Wood Protector stain.
- Alternative: allow wood to weather to natural grey.

IPE WITH OIL

JATOBA WITH OIL

CUMARA

COLOUR

- Introduce colour and patterns with banners, signage, add-on streetscape components, lighting, and projection light patterns

UNIVERSITY DISTRICT MARKETING COLOURS & PATTERNS

iv. Street planting

The urban forest includes any landscaping planted in the public right-of-way and plays an important role in establishing a healthy city environment. Planting in the public right-of-way enhances the physical, ecological and cultural aspects of the city. Trees significantly enhance the context for all new developments and the contribution that trees make to the quality of our environment as well as the many quantifiable benefits such as improved air and water quality, are well documented.

Trees must be mature and thriving in order for them to provide the streetscape with their many benefits. In order to mature and thrive, trees need space to grow and need sufficient quantity and quality of appropriate soil, oxygen, water and essential nutrients. In order to successfully plant trees within a streetscape comprised of so many utility elements, it is essential that the conditions required for tree planting be considered integral to the design, planning and construction of all projects. Particularly important is the early coordination between the planting plan and utilities plan in order to provide the necessary conditions for the successful growth of trees within the challenging environment of our city streets in Calgary.

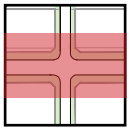
Placement of individual items throughout the public/semi-public realm will be considered in order to protect unobstructed pedestrian connections and intersection corners

STREET PLANTING

Street Planting	City Approval	Benefits	Limitations	Cost Implications	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Street Planting - Layout									
Line Assignments, Layout	Standard	• Approved outline plan street sections have coordinated tree line assignment locations • All utilities in road • District energy in lanes - if applicable • LEED ND - Coordinate tree planting requirements with LEED ND for tree spacing and locations	• Potential conflicts with utility stub-out to properties, needs to be coordinated • Design to limit reconstruction of surfacing and streetscape elements for lot servicing • Coordinate tree spacing with street lighting	N/A					
Street Planting - Urban Area Details									
Urban Tree Planting – Precast Concrete coffin	Still Current Standard		• Planting in small concrete box is an unsustainable tree planting method	$	★	★	★	★	4
Urban Tree Planting – City tree trench	Unconfirmed City detail under development	• Concept of tree trench is a sustainable method of tree planting • Intent is healthier trees • Review current City detail and proposed standards and propose a modified tree trench detail	• Current detail that City is circulating has potential construction and street structure support issues • Review current City requirement for volume of soil per tree	$$$$	★★★★	★★★★★	★★★	★★★★	1
Urban Tree Planting – Structural soil	Non-Standard	• Tree planting detail has proven successful in other municipalities in Alberta • Good structural support for road and sidewalk	• Methods of irrigation are not as effective • Method more successful in areas with higher water table	$$$$	★★★★	★★★★★	★★★	★★★★	1
Urban Tree Planting – Structural soil cells	City Promoting Use and has approved details	• Current state of the art urban tree planting method • Sustainable, healthy street trees • Structural support for road and sidewalk • Potential for stormwater infiltration/filtration • LEED ND, sustainable objectives	• Coordination with tree well/opening • Coordination with irrigation • Potential utility conflicts or accessibility conflicts • High initial installation costs	$$$$$$	★★★★★	★★★★★	★★★	★★★★	3
Street Planting - Neighbourhood Area Details									
Standard Tree Planting – Neighbourhood street	City Standard	• Tree planting in neighbourhood streets in grass boulevards should not require modified tree planting details • Potential tree planting in bio-swales in some locations		N/A					

SUMMARY

The following street tree planting details are recommended at University District



PRIMARY URBAN

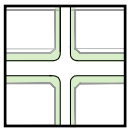
Tree planting in hard surface areas

MODIFIED TREE TRENCH

- Tree trench is a sustainable method of tree planting.
- Intent is healthier trees.
- Review current City detail and proposed standards.
- Propose modified tree trench detail to accommodate structural requirements of the roadway and sidewalk.
- Propose structural soil cell detail as a pilot project in Primary Urban area.

STRUCTURAL SOIL

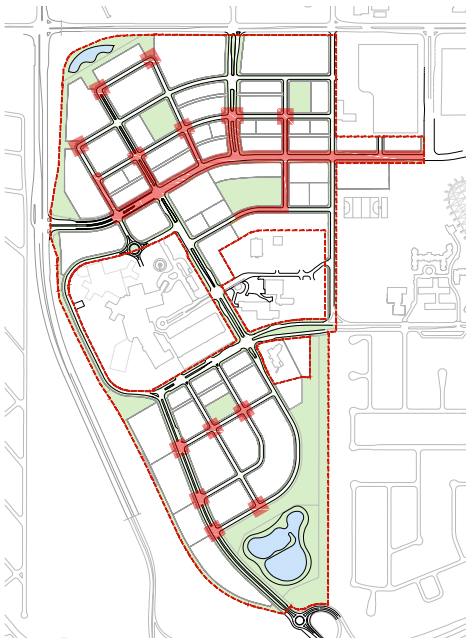
- Structural soil tree planting detail has proven successful in other local municipalities such as Okotoks, Fernie and the Town of Banff.
- Good structural support for road and sidewalk.
- Review potential areas of structural soil in addition to the tree trench detail to increase the area of the root zone.
- Propose structural soil pilot project in Primary Urban area.



RESIDENTIAL URBAN

BOULEVARD TREE PLANTING

- Modified trench where possible in softscape boulevard.



ADHERENCE TO:

- ☑ MDP/CTP PRINCIPLES
- ☑ UNIVERSITY DISTRICT MASTER PLAN
- ☑ STREETSCAPE PRINCIPLES

COORDINATION OF ALL STREETSCAPE ELEMENTS WITH STREET PLANTING PROGRAM

OTHER CONSIDERATIONS

- These items are important design considerations when developing a street planting program.
- Street tree planting details developed to coordinate with other streetscape detailing and disciplines.
- All boulevard planting to be coordinated with utility line assignments and utility alignments to ensure proper separations.
- Placement of street tree planting to ensure unobstructed pedestrian connections and intersection corners.
- All streetscape planting to conform to approved street cross-sections as attached in appendix.
- Adhere to University District sustainable objectives and principles.

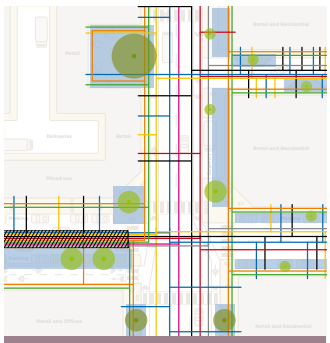
COORDINATE PAVING WITH TREE TRENCH

COORDINATE TREE OPENING WITH PAVING STRUCTURE

PLANTING GUARDS

OTHER PLANTINGS IN BOULEVARD

COORDINATE STREET TREE IRRIGATION



UTILITY COORDINATION

SUSTAINABLE ROAD MAINTENANCE

TREE OPENING

Tree opening detail to be coordinated with paver design and tree trench detail design.

STREET PLANTING

PLANTER WALL/BENCH

MANUFACTURER:

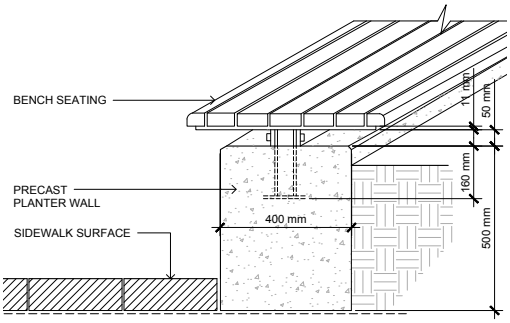
Custom Planter Wall

Custom Bench and/or Catalog Item

DESCRIPTION:

- To be incorporated into street tree planting layout.
- Planter wall and bench to be designed as interchangeable and connected components.
- Component flexibility for removal, replacement and reinstatement.
- Layout subject to approvals for setbacks from curbs at parking or driving lanes.

STREET PLANTING



PLANTER RAIL / EDGER

Planter layout and detail design to be coordinated with streetscape layout and detailed engineering drawings.

v. Storm water

Streetscape hard surfacing prevents precipitation from being absorbed into the ground and high quantities of stormwater run-off can contribute to flooding during large storm events. Stormwater management can help to mitigate these environmental problems by removing or delaying the run-off and by treating the pollutants before stormwater is discharged into the stormponds and ultimately into the river valley.

Where possible preservation of existing natural features, such as the south stormpond area and adjacent scopes, will assist in the stormwater management.

Where appropriate and feasible Low Impact Design stormwater facilities can be implemented into the streetscape to provide stormwater management benefits and contribute to the streetscape aesthetics. The stormwater management plan and infrastructure design will be in accordance with the approved staged master drainage plan and separate stormwater management reports will be submitted at each phase of the development.

STORMWATER

Stormwater	City Approval	Benefits	Limitations	Cost Implications	Importance to Principles				Comparative Ranking
					Livable, Connected, Pedestrian	Sustainable, Durable, High Quality	Notable, Iconic, Innovative	Vibrant, Active, Adaptable	
Bioswales / Rain Gardens in R/W	Non-Standard, City Promoting Use	• LEED ND • Visible environmental improvements • Stormwater controls • Non-typical streetscape • Demonstrates objectives and • Potential for pilot project	• Ongoing maintenance is required • Effectiveness of stormwater control for overall development • Perceived as just a token gesture? • Not suitable where there is parking at curb • Construction timing is critical	$$$$	★★★★★	★★★	★★★	★★★	1
Bioswale under Sidewalk	Non-Standard, City Promoting Use	• LEED ND • Stormwater controls • Demonstrates objectives and principles of West Campus • Potential for pilot project • Potential for University Avenue	• Unknown future maintenance costs • Potential replacement or removal costs • Potential utility conflicts or accessibility conflicts • High initial installation costs	$$$$$	★★★	★★★	★★	★★	2
Permeable Paving	Non-Standard	• LEED ND • Visible environmental improvements • Stormwater controls • Non-typical streetscape • Demonstrates objectives and principles of West Campus • Potential for pilot project • Potential to use in sidewalk amenity	• Typical design of permeable Paving is not as effective in dry and windy climates like Calgary • On-going maintenance is required • Coordination with base course drainage design is required to provide drainage to prevent frost heaving • Not as suitable for use in dense urban areas with no building setbacks	Potential $$$$$	★★★	★★★	★★	★★	2

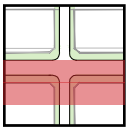
Note: Comparative ranking is a priority based on a review of the cost implications vs. an average of the importance to principles.

$ Low Cost = High Ranking
$$$$$$ High Cost = Low Ranking

★ Low Importance = Low Ranking
★★★★★ High Importance = High Ranking

SUMMARY

The following stormwater controls are recommended potential pilot projects where the opportunity arises.



BELOW GRADE INFILTRATION

- potential areas under hard surface

- LEED ND
- Stormwater controls
- Demonstrates objectives and principles of University District
- Potential for pilot project
- Potential for High Street

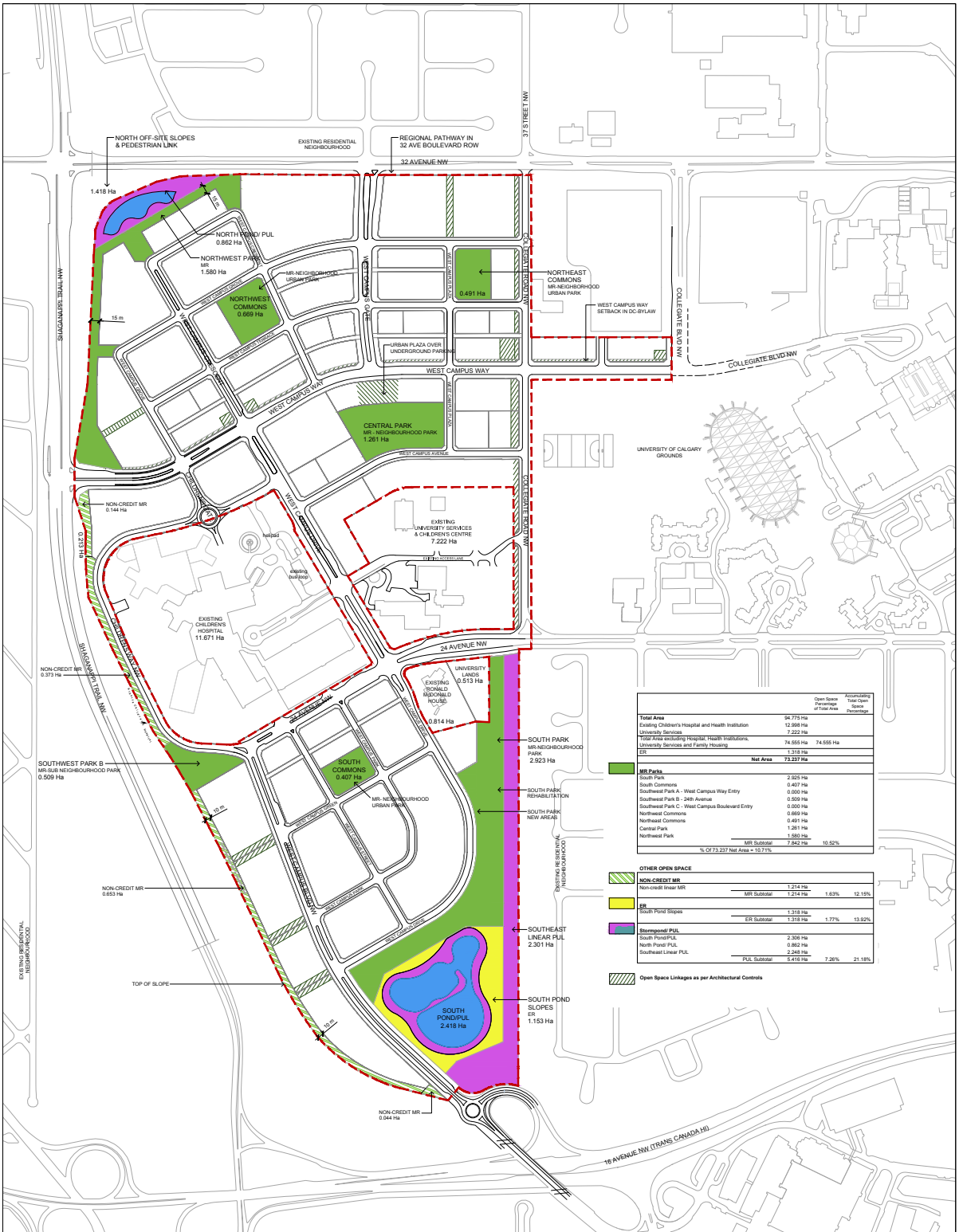
SURFACE BIOSWALES / RAIN GARDENS

- potential areas in road r/w

- LEED ND
- Stormwater controls
- Visible environmental improvements
- Non-typical streetscape
- Demonstrates objectives and principles of University District
- Potential for pilot project

ADHERENCE TO:

- ☑ MDP/CTP PRINCIPLES
- ☑ UNIVERSITY DISTRICT MASTER PLAN
- ☑ STREETSCAPE PRINCIPLES



CLIENT:
WCDT

PROJECT:
WEST CAMPUS DEVELOPMENT

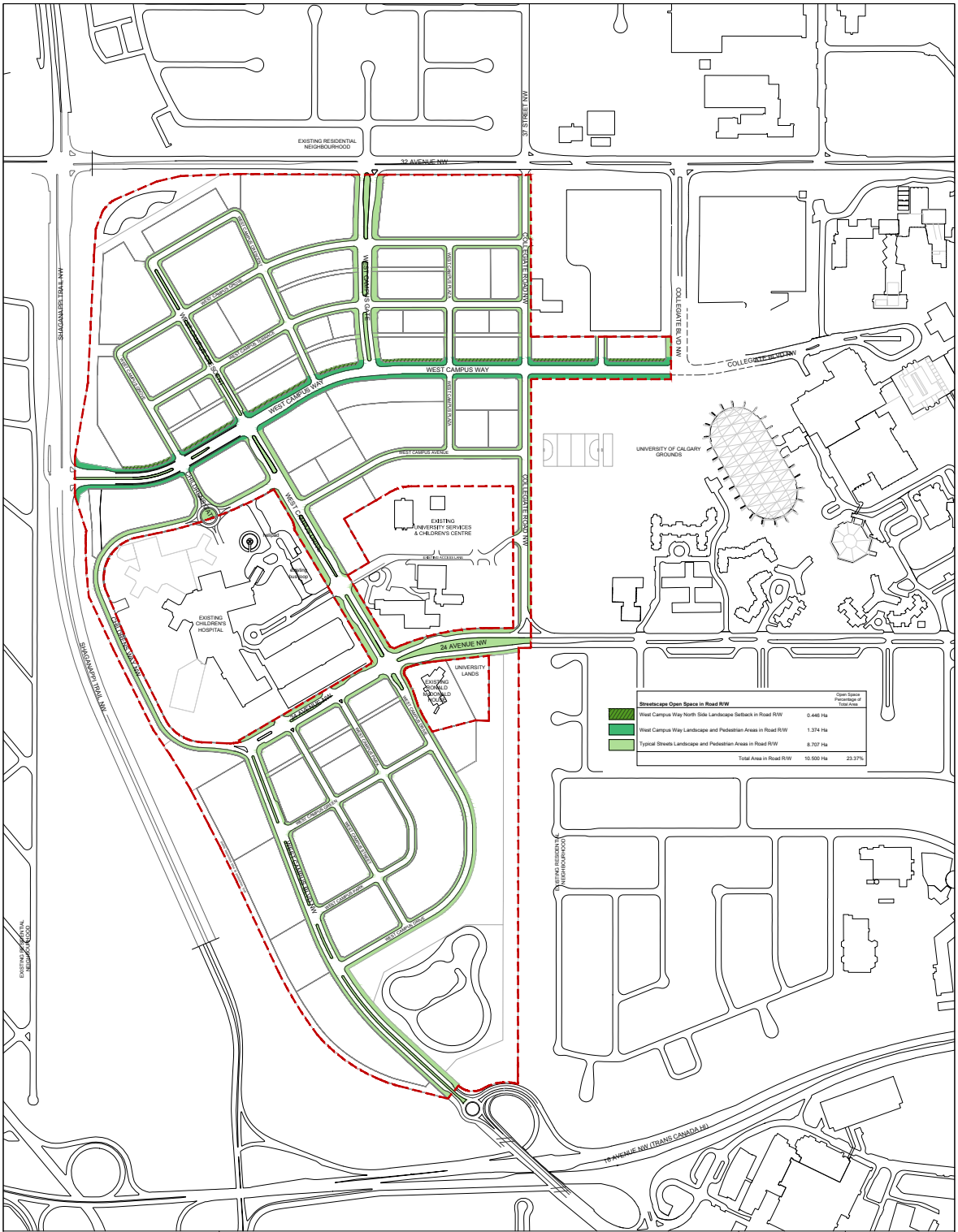
DWG NO.
DTR-2

DATE:
JUNE 2014

PROJECT TEAM:
DIALOG, City Forum, D.A.Watt, IBI, exp., Sasaki

OPEN SPACE AREAS

N 25 50 100 250m

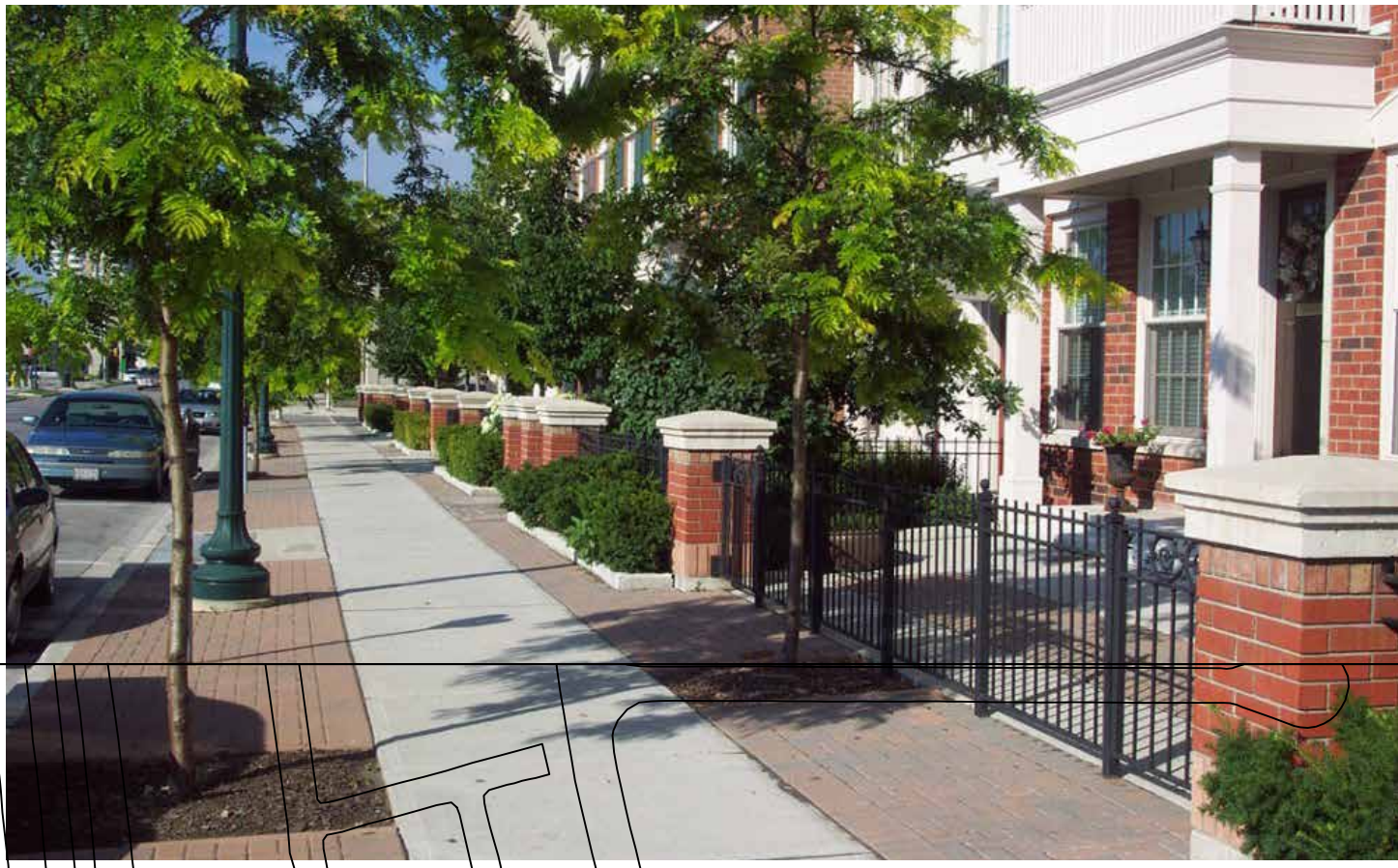


CLIENT: WCDT	PROJECT: **WEST CAMPUS DEVELOPMENT**	DWG NO. ----	DATE: December 2013
PROJECT TEAM: DIALOG, City Forum, D.A.Watt, IBI, exp., Sasaki	PROJECT TEAM: STREETSCAPE OPEN SPACE	N 25 50 100 250m	

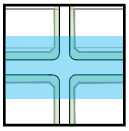
vi. Shallow utilities

Coordination with the shallow utilities is a critical component in establishing the quality of the urban streetscape to meet the principles of University District. To allow for a more urban interface with the street, a hybrid distribution system is being considered in the core area of the urban village. This system is referred to as a 'hybrid' because it would be designed similar to the downtown 'network' system, but due to less significant loading, it would have similarities in size to a standard distribution system.

In areas outside of the hybrid distribution system zone, a standard distribution system with modified design elements is being considered which will enforce the urban interface between the lot and street. The requirements of an urban residential village streetscape are different than the standard residential street with street access driveways and typical front lawns. The streetscape interface with planter walls, stairs, patios and plantings would not be possible with the standard URW on the property setback.

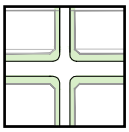


SUMMARY



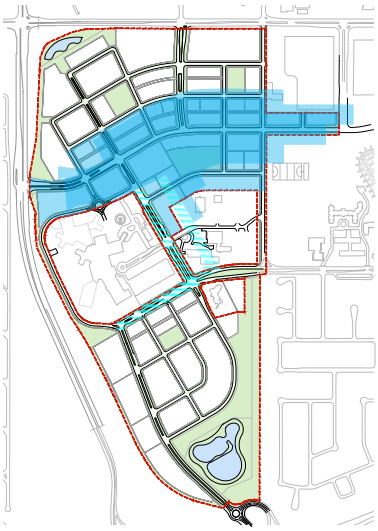
HYBRID DISTRIBUTION SYSTEM

- The objective is to increase the pedestrian realm and decrease the street clutter.
- There is to be no UR/W in the property line setback. The line assignment is within the road R/W. A zero lot line setback acceptable on the properties as allowed in the architectural guidelines.
- Access manholes are required but are much smaller than the downtown vault system and are flush with the sidewalk.
- Transformers and switches are integrated into the building with access via an exterior door.
- Rooms for shallow utility pedestals, transformers etc. must be large enough to access for maintenance and upgrading.
- All proposed structures or rooms within the "Hybrid Distribution System" for shallow utility pedestals, transformers, switches and etc. must be large enough to allow for maintenance and upgrading of equipment.



STANDARD DISTRIBUTION SYSTEM

- In areas outside of the hybrid distribution system the objective is to minimize disruption to the urban interface to allow for stairs, fencing and planting adjacent to the property line.
- Line assignments are to be within the road R/W for 18.4m road widths or greater.
- Working to minimize the extent of UR/W on roads with narrower widths.
- Reviewing possible update to lid standards for a flush and integrated appearance. The current standard often protrudes from the surface.
- Routing layouts are to minimize UR/W pockets on private properties.



ADHERENCE TO:

- ☑ **MDP/CTP PRINCIPLES**
- ☑ **UNIVERSITY DISTRICT MASTER PLAN**
- ☑ **STREETSCAPE PRINCIPLES**

All of the concepts and design proposals must be supported by Enmax, ATCO, Telus, Shaw and other interested stakeholders.

C. OPEN SPACE & LANDSCAPING

i. Open Space & Landscaping Vision

Vision: The Open Space in the University District will consist of a variety of places for outdoor activity and passive enjoyment. Linkages between these spaces will serve to create a comprehensive open space system, creating a more walkable, livable and sustainable community.

INTENT

The intent of the Landscape Design Guidelines is to provide direction for the character, design and materials to be applied to the development of the University District community to guide the function, aesthetics and sustainability elements to be incorporated into the landscaping. . The open space and public pathways which traverse throughout the community play an integral role in creating an active and healthy community. Site landscaping will also be an important component which will complement the open space, facilitate pedestrian travel and passive enjoyment.

PUBLIC PLACES AND CONNECTIONS

PUBLIC PEDESTRIAN CONNECTIONS

In addition to streets and sidewalks, a variety of public parks and small plazas have been envisioned as well as a series of public pedestrian connections through development blocks. This finer grain network of shortcuts traverse through or between the residential parcels offering alternate routes with a variety of scales and experiential qualities to connect to public spaces. Increased social capacity within these shortcuts can also be enhanced by locating the shared residential amenity spaces adjacent to these pedestrian corridors, such as seating or outdoor dining/BBQ area, further blurring the public and semi-private realms and increasing the opportunities for spontaneous social interactions between community members. Connections should also be designed with consideration of site context, existing connections and in accordance with CPTED principles.

PUBLIC OPEN SPACES

The biggest of the public open spaces is a park situated as the south terminus to the University Link. This park will predominately be a passive green space with residential blocks 22 and 24 flanking the east and west edges and mixed-used development with commercial units at grade along the north edge. Along this northern edge and wrapping around the corner onto the retail street should be commercial activity that contributes to the energy of these outdoor areas. Restaurants and cafes would attract

people to the area, and would further enhance the outdoor experience by providing weather protection and seating and dining terraces along the sunny edge.

As a threshold or gateway into the Park from the retail activity on University Avenue, flexible space should be incorporated into the park. This occasional yet intensively used area would be a transitional space from the more urban edges directly adjacent to the restaurant and café terraces to the larger passive green space of the park to the south and would allow for a variety of programmed activities such as:

- Farmers Market or Artisan Market
- Arts, Book or Food Fairs
- Temporary badminton or bocce courts

SMALL URBAN PLAZAS

There is the opportunity for a number of small urban plaza spaces to be incorporated into the fabric of the main retail street. Each of these spaces may have similar associations and synergies with the adjacent retail activity, and should respond to the opportunities for this potential café or restaurant energy to spill out and inhabit the edges by providing canopies and well placed site furnishings. They should also build on their unique or site specific characteristics where possible. For example, a plaza space on a bikeway could provide additional amenities that serve a specific type of user, such as weather protected bike racks, possible bike maintenance stations etc. Designs of these plaza spaces should complement and enhance the adjacent streetscape and correspond to the adjacent street tree planting. Urban plazas should, whenever possible, be located in areas with good sun exposure.

PUBLIC REALM INTERFACE

RESIDENTIAL SETBACKS

Building setbacks, where required, on residential private property should be landscaped. In the case of residential units at street-level, the following criteria should be considered:

Low ground planting or mowed grass strip should be planted immediately adjacent to sidewalk, such that no plant material encroaches onto walkway.

Slope and/or terrace setback areas where possible, such that private outdoor spaces are nominally higher than the adjacent sidewalk or public realm.

Low walls, combined with 'layered' planting rows and/or

hedges should be employed to enhance the streetscape experience and define the private outdoor areas.

Walls (including retaining walls) should not exceed 24" (610 mm) and should be faced with materials matching adjacent buildings or of high quality architectural Cast In Place concrete finish. Precast concrete unit retaining walls should not be considered. Concrete block retaining walls are prohibited.

A mix of evergreen shrubs and deciduous hedge planting should be used to screen private patios and outdoor spaces from each other, while providing seasonal variety. A maximum height of hedge from patio level should not exceed 5 feet or 1500 mm. Greater visibility through the use of lower growing plants should be provided between the patios and street.

SETBACKS ON RETAIL CORRIDORS

The building setbacks along the retail corridor are established in the Direct Control land use district. The following should be considered:

The adjacent streetscape character should be considered when selecting the hard and soft materials within the setback; The setbacks are important to support spill out activity from adjacent retail units. The north side of University Avenue along the retail high street will have ample sunlight reaching the street level and should have a setback which will allow spillout to occur. The setbacks along the north side should be generally consistent with the exception of corners if patio space is being accommodated. A setback of between 3.0 – 4.0 m should be maintained.

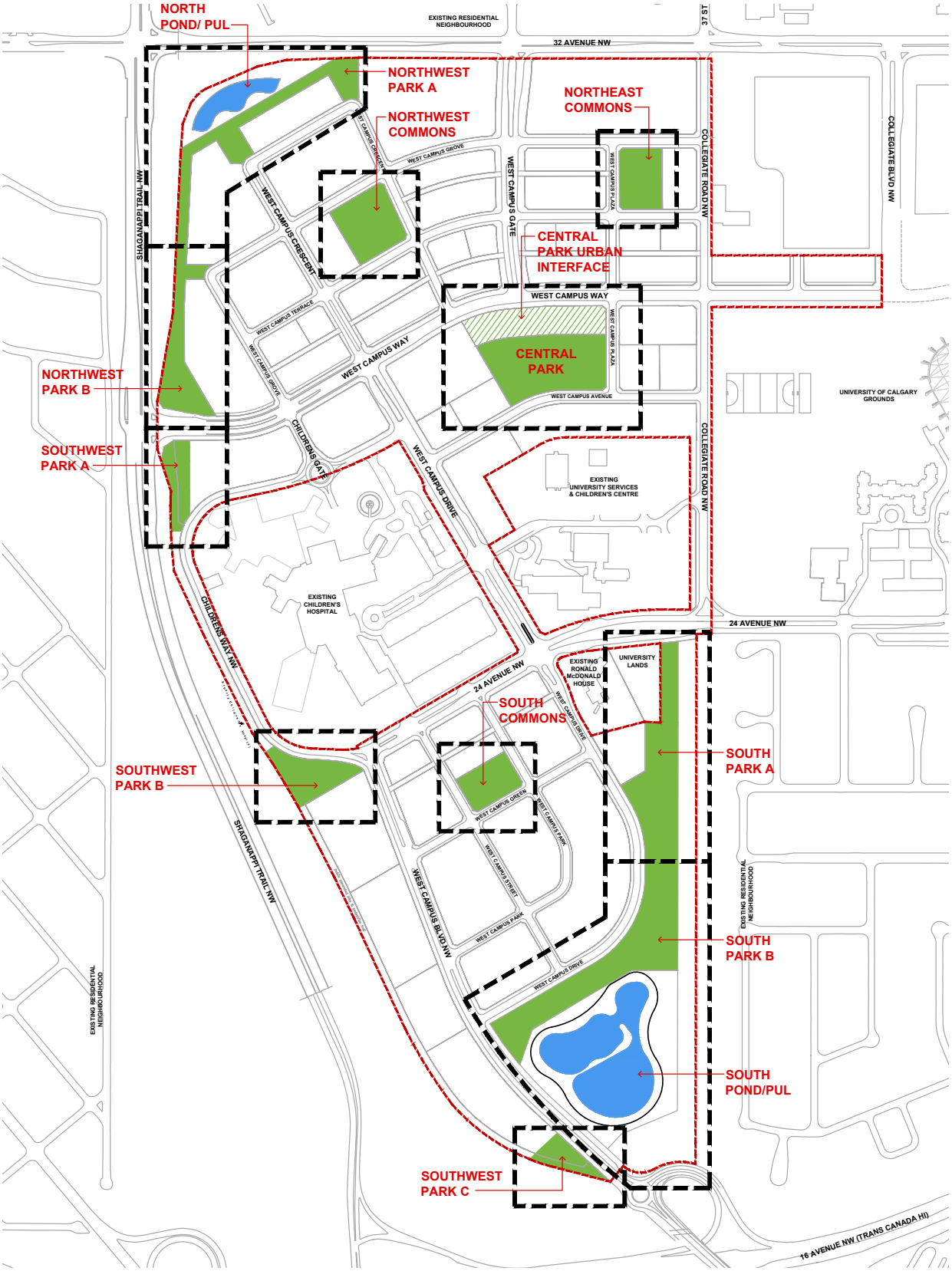
There is no requirement for a setback along the south side of the retail high street. A zero setback is encouraged. Buildings along a block should have a consistent setback.

Increased pedestrian flow will likely result in focused planting areas, with plant species and sizes selected in consideration of Crime Prevention through Environmental Design (CPTED) principles;

A variety of quality, well placed site furnishings should be provided, such as benches, bike racks and light fixtures;

OFFICE SETBACKS

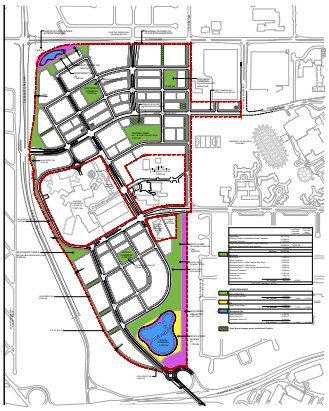
Office setbacks are described in the Direct Control land use district. The setbacks on University District provide continuity with the retail main street and create a pedestrian oriented environment where frontages and entrances are close to the sidewalk and street in order to engage the public realm.



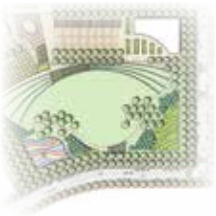
Open Space Key Area - Plans Submitted - DTR #2

OPEN SPACE AREAS

There is a variety of major components that make up the open space system in the master plan. The combined design objective is to express the sustainable, collaborative and innovative principals of the University District vision in the open space system.



Open Space Areas

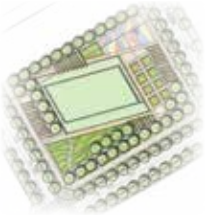


CENTRAL PARK

CENTRAL PARK
URBAN INTERFACE

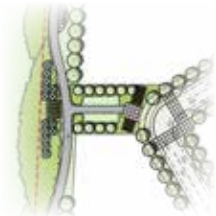
NEIGHBOURHOOD COMMONS

NORTHWEST PARK



SOUTH PARK

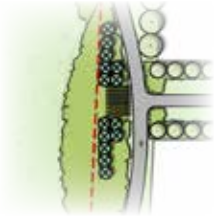
SOUTHWEST PARKS



LINKAGES

PEDESTRIAN CIRCULATION

STREETSCAPE



LANDMARKS

ii. Parks Non-MR:

CENTRAL PARK

NEIGHBOURHOOD PARK

Central park will be the open space heart of University District. The community park to the east will provide a linkage and transition to the University of Calgary campus and sports fields and this space will accommodate a variety of outdoor programming for civic and community uses. The perimeter of the park will offer a variety of sitting and landscaped areas and the interface with the surrounding building pedestrian spaces will be carefully integrated.

This park was envisioned to allow for the construction of underground parking to assist in fulfilling the parking needs of the community.

CENTRAL URBAN PLAZA

URBAN INTERFACE

The Central Park Urban Interface is the open space linking the commercial high street with Central Park. The landmark feature at the entry on the High Street will also be a visual terminus to the 39th Street boulevard south axis. The plaza space will be framed by iconic buildings that accentuate the central arrival to the community. This space can be lined with cafes, local service retail and community functions and the perimeter interface will be coordinated with the design of the building pedestrian spaces. The summertime market square will transform to a skating plaza in the winter season.

The park interface will be built over an underground parkade. There is to be a minimum 25% permeability to the central park site along the University Avenue frontage.

ii. Parks MR:

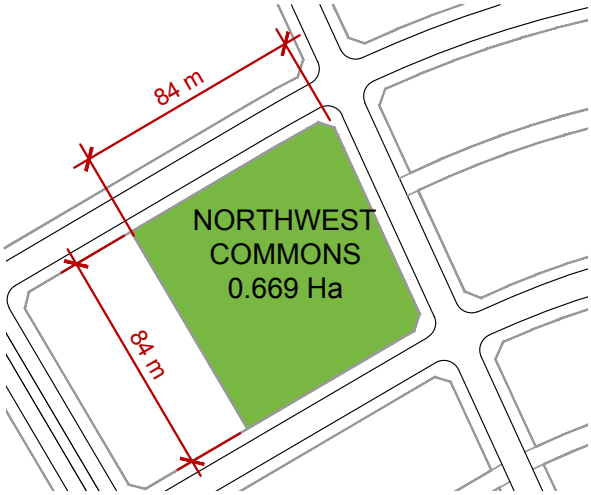
NEIGHBOURHOOD COMMONS (NORTHEAST, NORTHWEST, SOUTH)

NEIGHBOURHOOD URBAN PARK

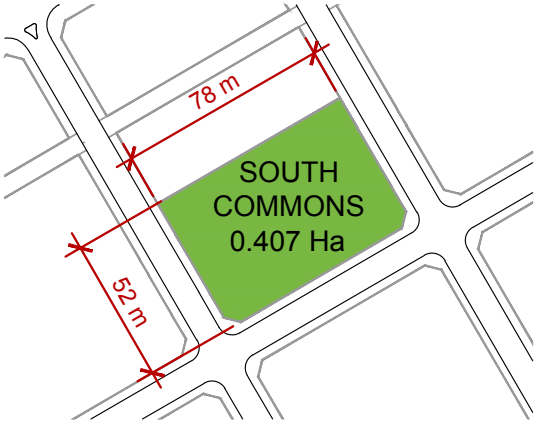
The three Commons parks are the outdoor focal point of each of the residential neighbourhoods and the character envisioned is more urban in nature. These will be parks where you can meditate, walk, sit, eat, socialize, read, sunbathe, cool off, participate, meet people, start your run, or just relax and people watch. Each park will feature a central open space, park entry gateways, perimeter pedestrian circulation, sitting and planting areas. The interface with the surrounding land uses will be coordinated with the design of the perimeter of the park. Each park will have a unique character to provide an identity to each neighbourhood. All the parks are well connected to the pedestrian and open space system and the adjacent sidewalk and street tree planting will be carefully coordinated with the park design.

NEIGHBOURHOOD COMMONS

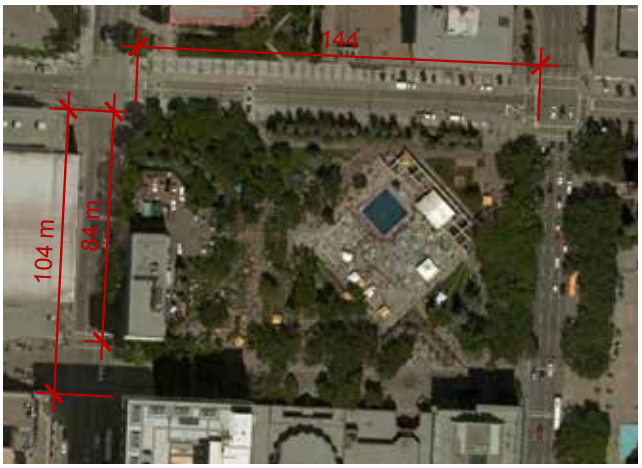
size comparisons

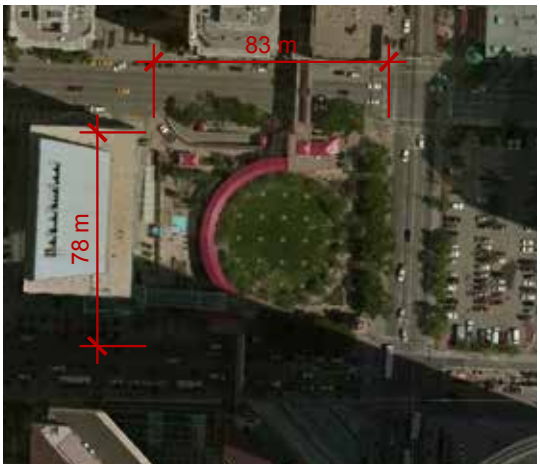


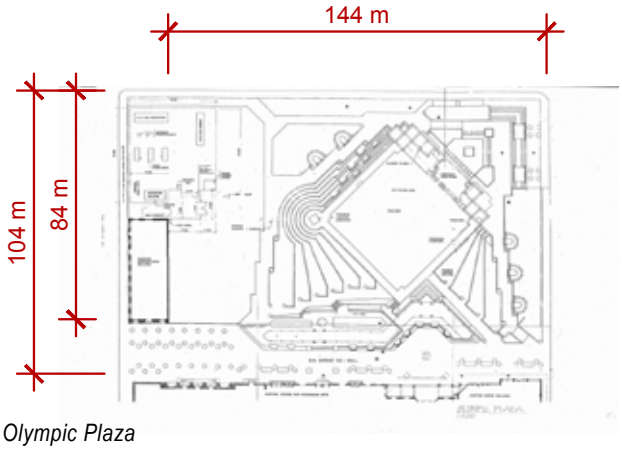
Northwest Commons
University District, Calgary



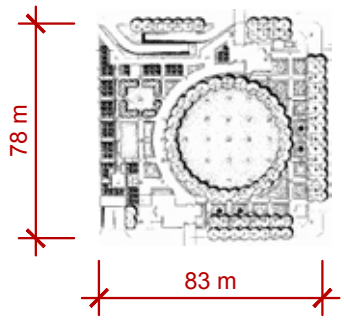
South Commons
University District, Calgary







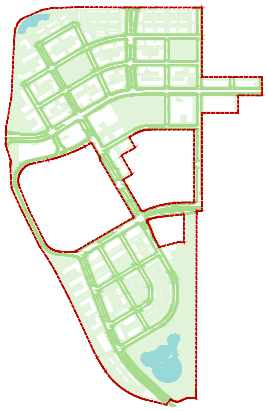
Olympic Plaza
Calgary



James Short Park
Calgary

NORTHWEST COMMONS

Preliminary Concept Plans (draft)



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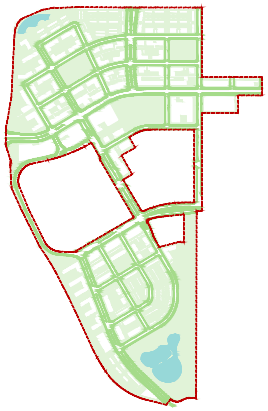
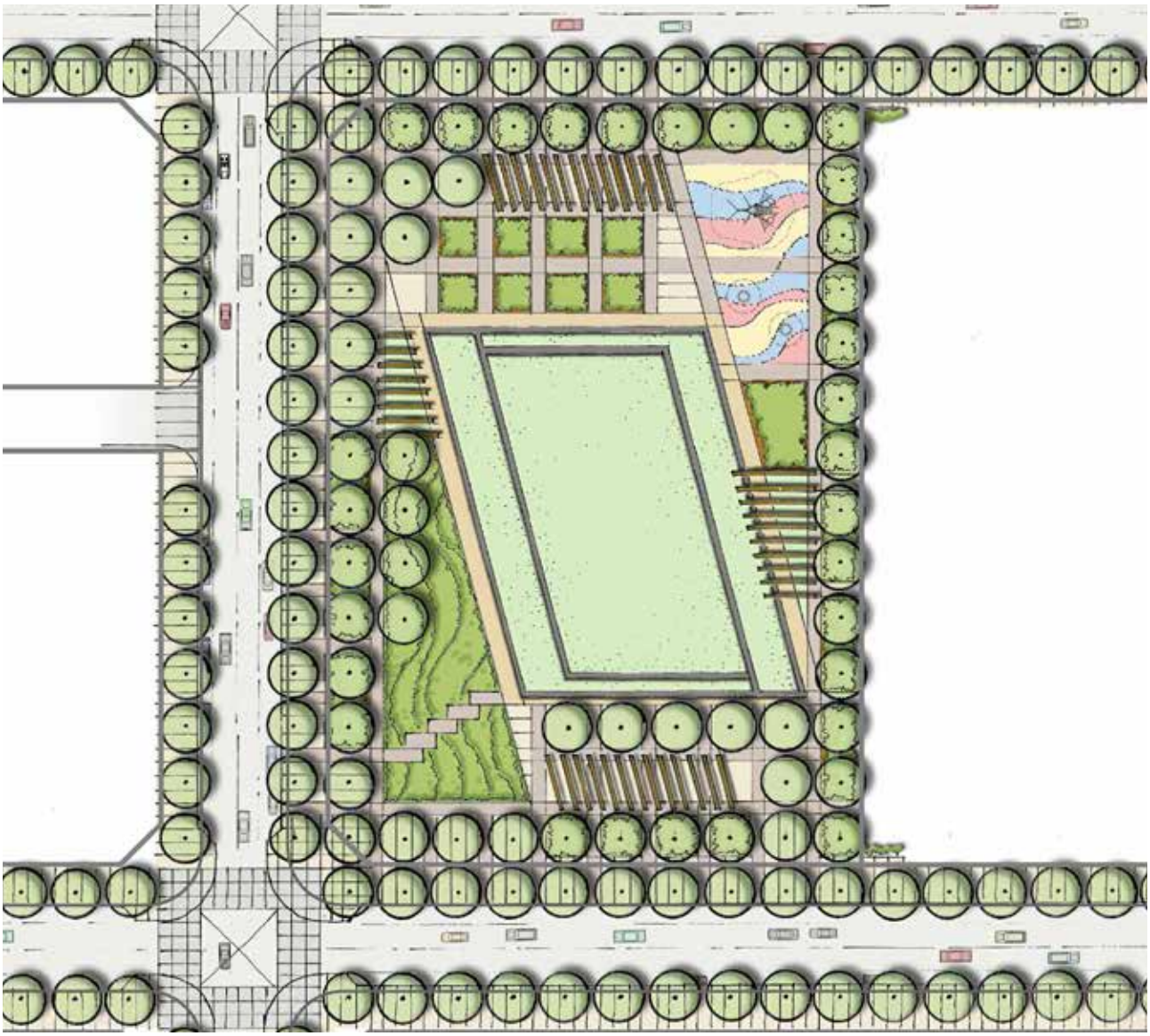




THE COMMONS

Demonstration Illustrations

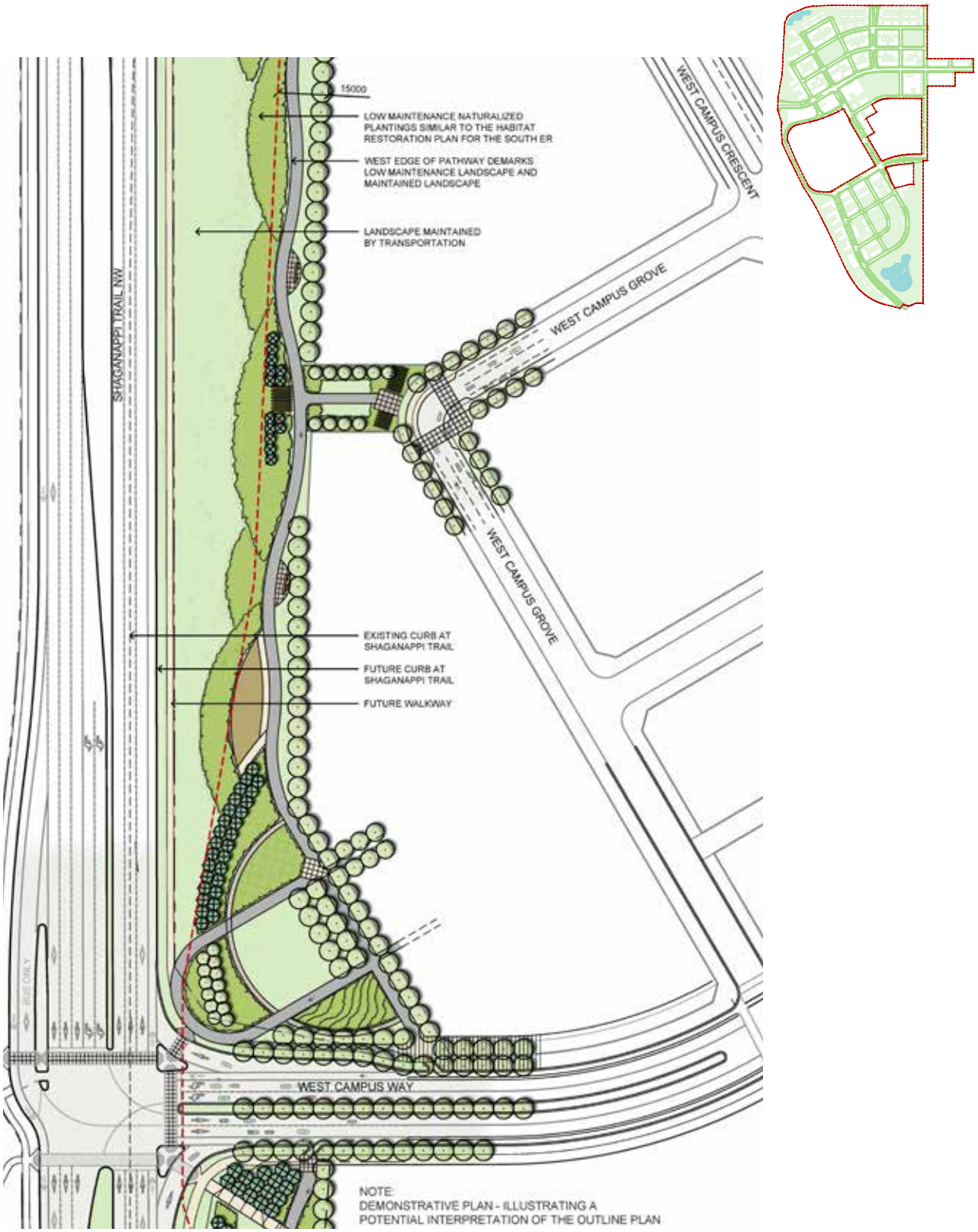
NORTHWEST LINEAR PARK

This park area performs a linear recreation function by providing a regional pathway link to different areas of the community. This perimeter regional path and park system that surrounds the site is an important concept of University District community. The park provides access and linkage to the different areas of the neighbourhood, Market Mall, and the innovative stormwater feature. Community gardens with wind protection will be located at the southern end of this park. With the exception of the perimeter nodes, the park will have a more natural feel and the landscape will blend into a naturalized regraded perimeter area which was previously allocated for road widening.

NORTH STORM POND PUL

The stormponds are significant parts of the open space system. This area while functioning as a necessary stormwater facility will also provide a gateway opportunity to establish the image and character of the University District Community at the northwest corner of the site. The open space will also be the visual terminus to the treed diagonal boulevard connecting the north and south neighbourhoods. The design of this area will evolve as the requirements of grading and stormwater for the development are defined. The design intent of this green space and stormwater infrastructure will be to use this opportunity to visually express the innovative and sustainable principals of the University District community. Combined with the North Linear Parks and access easements this will be an important part of the open space system in the North Neighbourhood.

NORTHWEST PARK B



SOUTH PARK

NEIGHBOURHOOD PARK

South Park provides an important north-south link in the open space system. The existing park spaces will be enhanced with additional planting, trail connections and entry features to the south neighbourhood. A more active area will be developed with a level grass open space area, a structured play area and perimeter pedestrian sitting areas. The park will be a blend of natural and maintained landscape areas.

SOUTHEAST LINEAR PUL

This PUL area of existing underground utilities is an open space adjacent to the north-south linear park and provides an important green space setback to the laneway and back-of-lots of the University Heights community. The landscape in this area will be blended into the natural and maintained areas of the South Park.

The existing steep slope at the southeast corner of the property is greater than 15% slope. The aim is to improve the native vegetation in this area and provide a pedestrian connection to the potential future pathway link to the south University Heights area.

SOUTH POND SLOPES

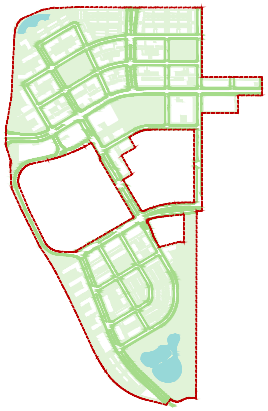
The existing slopes around the pond area above the high water level are greater than 15% and are classified as ER. The objective is to protect the existing native plant groupings, improve and naturalize the remaining slopes and improve the pedestrian connections around the pond area.

SOUTH POND PUL

The stormpond PUL area is a naturalized pond and wetland area and presents a very pleasant open space amenity. The interior lower pond area has an enclosed and protected character which provides an interesting contrast to the adjacent wide-open top of slope areas. The goal is to retain and improve the natural vegetation and Biodiversity in the pond area.

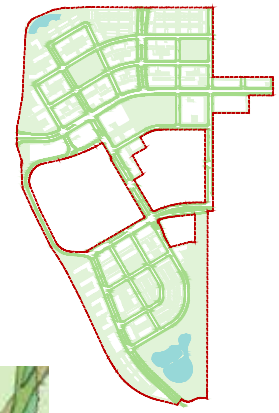
SOUTH PARK A

And Southeast PUL



SOUTH PARK B

And Stormpond, ER and PUL



SOUTHWEST PARKS

SUB-NEIGHBOURHOOD PARK

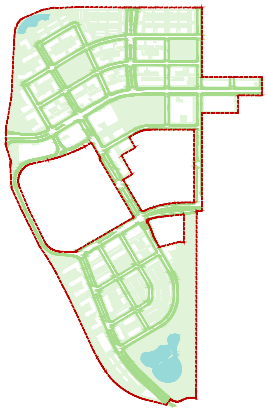
These park areas are important nodes on the perimeter pathway and open space system. Park A is a key entry to University District. Park B provides a terminus and focal point on the 24th Avenue boulevard visual axis and a logical location to provide an impressive viewpoint landmark to the mountains up the Bow River Valley. Park C will present a landmark park entry feature to University District and a perimeter landmark viewpoint overlooking the Bow River Valley and Edworthy Park. Both parks will have perimeter pedestrian circulation, sitting areas, a central open space meadow and allow for the perimeter pathway circulation. The top edge of the park will blend into the natural vegetation of the adjacent slopes.

SOUTHWEST SLOPE

The open space is anchored by the off-site south and west facing steep slopes of the South Slope Buffer adjacent to Shaganappi Trail. The existing slopes around the perimeter area are greater than 15% slope. The intent is to improve and naturalize the vegetation on these man-made steep slopes. There will be a setback at the top of slope which will form an integral link in the perimeter pathway system and provide spectacular views over the Bow River Valley.

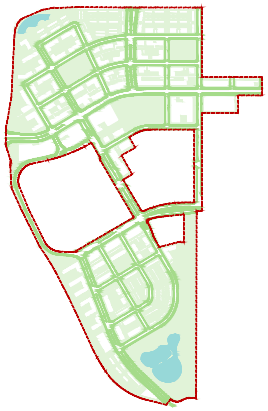
SOUTHWEST PARK A

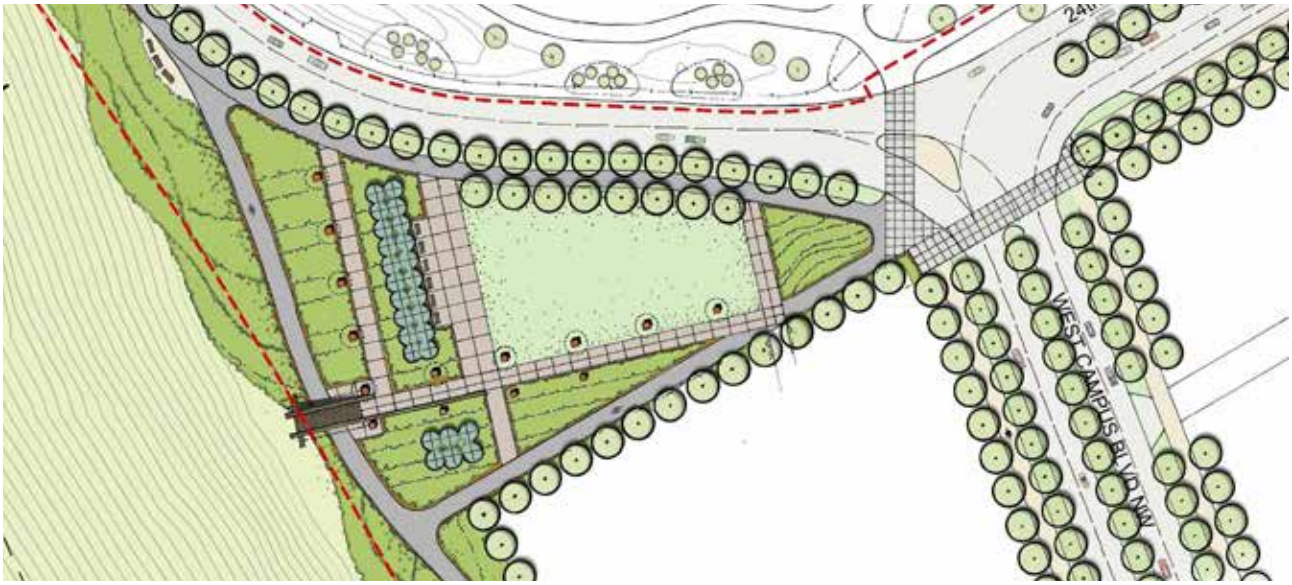
University Avenue Entry



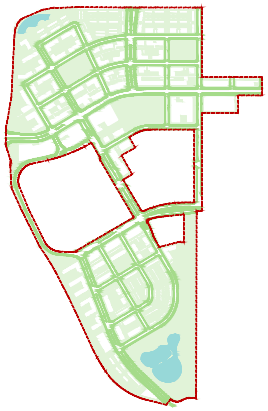
SOUTHWEST PARK B

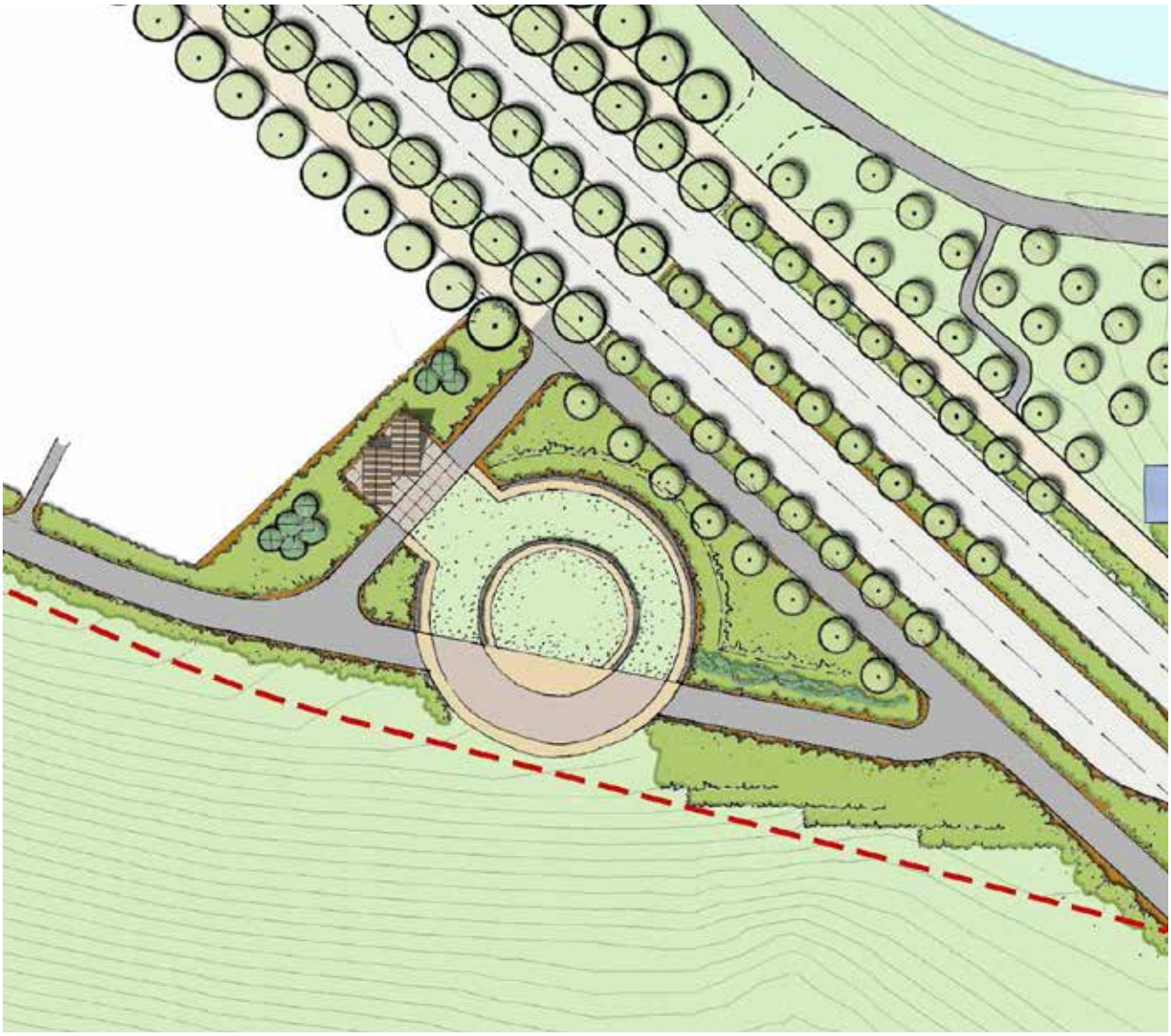
24th Ave Park



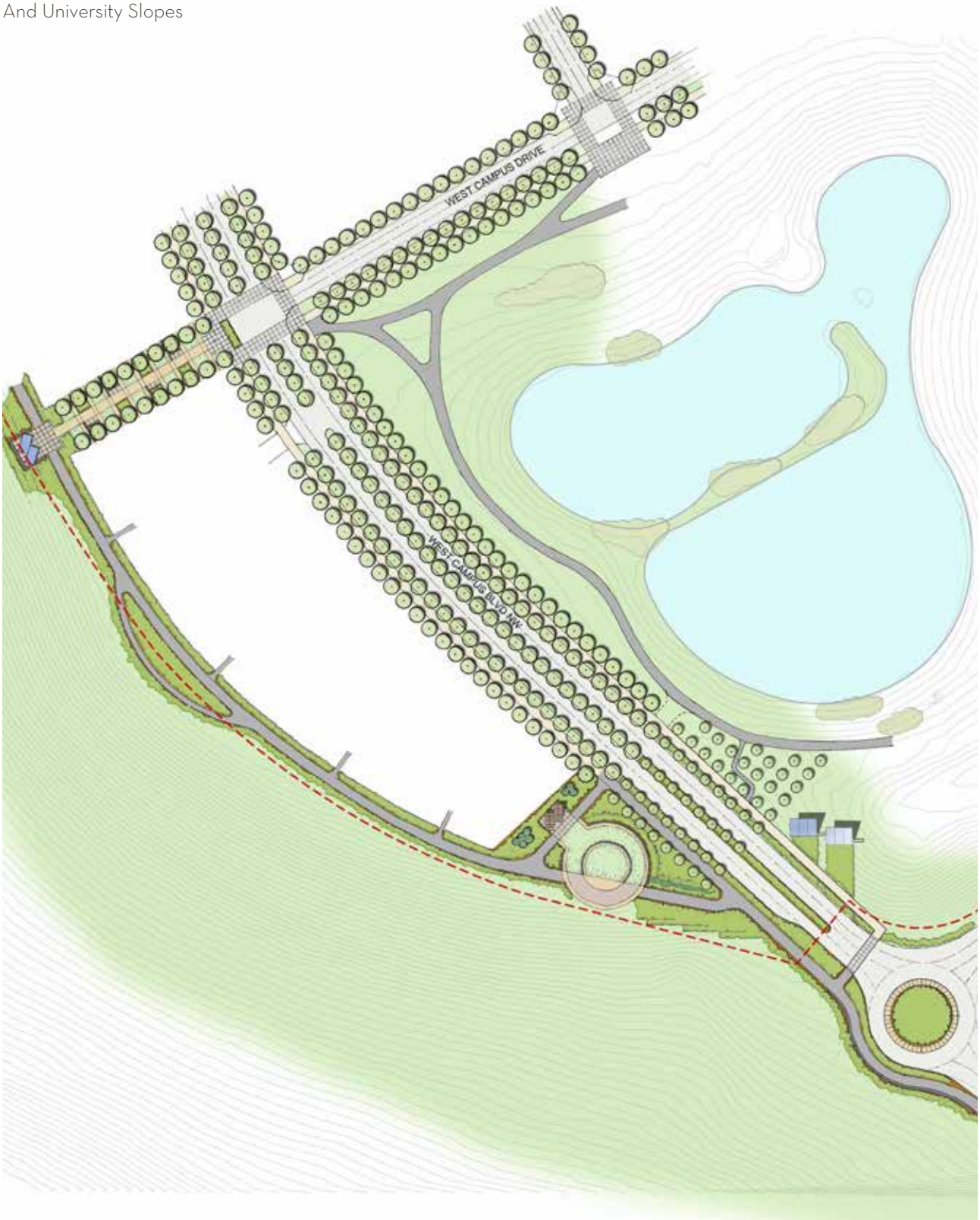


SOUTHWEST PARK C
And University Slopes



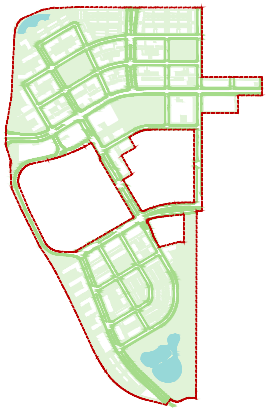


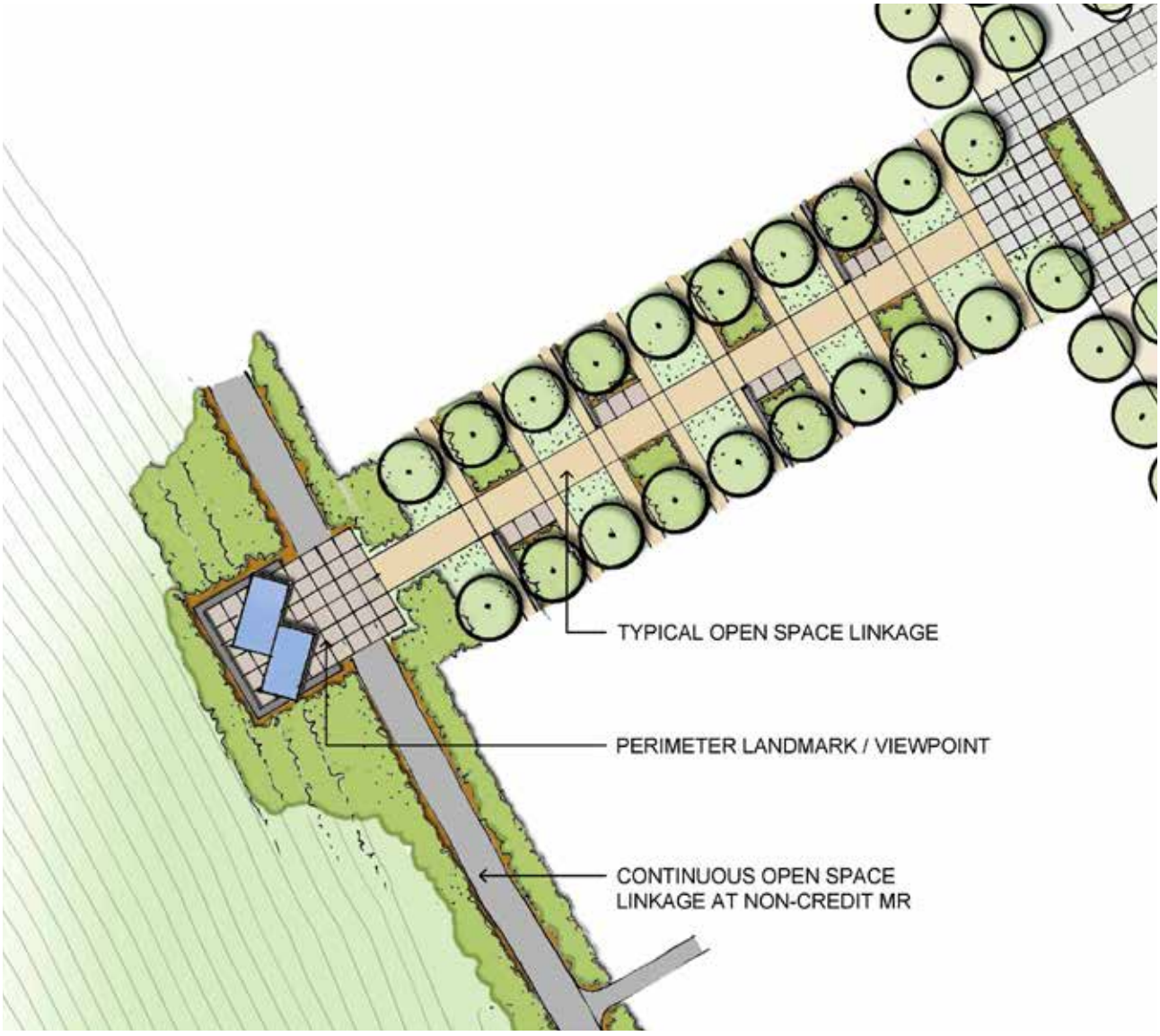
SOUTHWEST PARK C
And University Slopes



PUBLIC OPEN SPACE LINKAGES

Linkages in the north and south neighbourhoods connecting the variety of ER and MR park spaces are designated as easements on the development properties. These are important components of the open space system creating access to the perimeter pedestrian pathway, providing public access at regular intervals and completing the north-south link adjacent to 39th Street. The small urban park easements on the High Street provide additional variety to the activity street environment creating a series of urban plazas along the mixed use spine. Non-credit MR also provides critical continuous links in the open space system.





INNOVATION

i. Innovative Pilot Projects & LEED

University District's Master Plan has developed sustainability strategy which is connected to the planning an Durban design process for the development. This strategy is based on community consultation, context, site specific analysis and ongoing research and will continue to develop over the duration of the project. The Trust has targeted LEED-ND (the U.S. Green Building Council's Leadership in Energy and Environmental Design for Neighbourhood Development) and has identified these strategies outlined in this section and throughout this document. As the project evolves, additional opportunities for innovative pilot projects that are aligned with these sustainability principles will be explored for feasibility.

ENERGY EFFICIENCY IN INFRASTRUCTURE (LEED-ND)

All new infrastructure in University District will achieve a minimum 15% overall reduction in energy use. This reduction is in relation to the baseline case (lowest-first-cost infrastructure) and is anticipated to be applied to the following infrastructure:

- Street lighting
- Bus shelter lighting
- Traffic signals

RECYCLED CONTENT IN INFRASTRUCTURE (LEED-ND)

University District is targeting 50% of new infrastructure (by mass) to be of recycled content. Based on calculations to date 62% of new infrastructure mass are new road gravels for the base and subbase. Therefore, this target can be achieved by using post-consumer recycled content (recycled concrete) majority of the road gravels base and subbase.

SOLAR PAVEMENT

SOLAR OR BICYCLE POWERED CELL PHONE CHARGING STATION

SOLAR POWERED SIGNAGE

SOLAR BENCH

OTHER CONSIDERATIONS

- Integrate additional streetscape elements with a sustainable message compatible with University District principles
- Provide continuity of design of streetscape elements

VERTICAL WIND TURBINES

LEED ND - 40 MAXIMUM

SOLAR POWERED STRUCTURES

HEATED SIDEWALKS OR ROADWAYS

SOLAR ASSISTED LIGHTING

LANDMARKS

D. MAINTENANCE & LIFECYCLE MANAGEMENT

To successfully implement the University District vision, the public realm will include a vibrant streetscape including non-standard elements (paving, furniture, lighting, etc). These non-standard elements need to be maintained into the future, with some further administrative work required to resolve the funding mechanism for this maintenance. There has been a commitment to resolve the outstanding maintenance of the proposed non-standard public realm elements, which may be funded in one of the following mechanisms, or through any combination thereof:

- The City of Calgary may provide funds through a diversion of tax dollars (via direction from City Council);
- the West Campus Development Trust may provide funds; and
- funds may be raised through a Residents' Association(s).

Other funding options may be available and the method used to raise funds to maintain the public realm may change over time. However, collaboration between The West Campus Development Trust and The City of Calgary is needed to ensure the public realm is maintained to an acceptable standard into the foreseeable future.

5. SITE PLAN & DESIGN

The Site Plan and Building Design guidelines strive to ensure that new development is compatible with the vision and urban design strategy. The community has been planned to consist of buildings that are diverse, yet compatible in a richness in quality. The Site Plan and Building Design guidelines are informed by the Urban Design Guidelines.

STREETS AS GLUE

Streets form the "glue" that binds a diverse community together. They become outdoor rooms at the ground plane when bounded by appropriately-scaled buildings. They contain the landscape that adds the richness of nature to the city. And, they support the day-to-day activities that make for an active and vibrant community.

A PORCH CULTURE

The concept of a porch culture on the street is derived from the notion that all ground level street facing dwelling units have direct access from the fronting streets. It is also critical from a street security standpoint to have eyes and ears on the street.

A PUBLIC GROUND FLOOR

Placing public-oriented uses on the ground floor increases the social experience and diversity in the community. Uses like retail, studios, and home offices animate the ground floor and provide useful services to residents.

COMMUNITY MEETING PLACES

An important place in a neighbourhood occurs at the intersection of streets. This is a point of high interaction amongst people where they arrange to meet, or simply bump into each other. Small public plazas, bordered by uses like retail, cafes, community facilities, and main building entries, will facilitate these meeting places.

ACTIVE RETAIL STREET

University District is the major east-west corridor connecting the community to the University campus. It is the retail core for residents, visitors, and students alike. Therefore, it has the highest order in the hierarchy of streets containing critical active uses, such as shops, restaurants, and community functions. The architecture along this street should be inviting and create a human-scale environment.

LANDMARK BUILDINGS

The plan allows for higher buildings, located on Blocks 13, 14, 15, 16, 17, 22, and 24. By considering the design of these higher buildings as an urban grouping, they become iconic elements in the community landscape.

MAJOR LANDSCAPE ELEMENTS

Landscape concepts can be used as a major organizing element of the new plan. For example, certain zones of the site landscape can create major landscape statements and establish key nodes of public interaction.

ACTIVE COMMUNITY PARK

The plan identifies a major open space in the south neighbourhood. This space should be clearly identified as the major place for community outdoor activities with paths and bikeways directed to this space and connected to adjacent neighbourhoods and community facilities.

DEMONSTRATED SUSTAINABILITY

The sustainability mandate for University District is exemplary. Sustainable approaches that are made visible by demonstration throughout the site will contribute to the educative value of these strategies.

PRIVATE VERSUS PUBLIC SPACE

Typically, a clear distinction is normally made between those spaces that are for public use and those that are for the exclusive use of residents. An alternative approach is to blur the edges somewhat between these zones in order to create greater interaction amongst people. Small plazas adjacent to building lobbies and green courts within private development sites are examples of spaces for the use of residents that also allow for some public transitioning through blocks.

INVITING LIGHTING

Inviting lighting is critical to establishing an atmosphere that feels friendly, warm, and safe for users of the site at night. Although street lighting will be defined for the site, it can be augmented with atmospheric lighting in public and private spaces and walkways.

PEDESTRIAN CONNECTIONS

A system of pedestrian connections provides greater continuity and choice in the way people move about the community. Pathways through private development sites will allow for both resident and public circulation across blocks to connect to public open space while maintaining privacy for residents.

BUILDING DESIGN DIVERSITY

Building diversity is a key component of the plan because it will create a more interesting environment for University District. Architectural variety throughout the site can be achieved by allowing for a variety of developer proponents and design firms for buildings, and encouraging varying styles of architecture while respecting the Calgary context.

MATERIAL AND COLOUR PALETTE

A clear palette of materials and colours for buildings and open spaces is key to establishing a well-knit community.

VIEW PRIORITY

One of the important aspects of marketing the University District residences will be the availability of distant views from individual units. The key views are of the river valley and Rocky Mountains to the west.

INNOVATION ZONE

The innovation zone will promote housing diversity by accommodating a mix of housing units within a block. (See Appendix 3).

A. BUILDING ARCHITECTURE

The building architecture should provide a diversity in appearance, creating a more visually interesting environment for residents and visitors while responding to the local context and creating a street-oriented development.

USE AND ACTIVITY

MIX OF USE

To ensure vitality and diversity in the community, the designated land uses (zoning) identify opportunities for a mix of uses including retail, restaurant, office, and community space in addition to residential. Integrating these uses into the same building contributes to the animation of the community.

A CENTRAL SHOPPING AREA

A variety of retail stores will be provided in a central location, along University Avenue. The retail mix should include both local/ convenience (eg. supermarket, pharmacy, services) and lifestyle/ entertainment uses (eg. restaurants, cafes). Restaurant patios are encouraged, particularly along the north side of University Avenue. These retail uses should also wrap along corners of the streets which lead into University Avenue.

ANIMATING PLAZA SPACES

The use along the edges of plazas should provide animation and interest for people using these open spaces. Retail, restaurants with outdoor patios, and community / recreation uses can satisfy this need by generating activity.

LIVE-WORK UNITS

Areas may be included in building designs to provide spaces to serve as home offices and studios. In the case of townhouses, the ground floor, with a direct relationship with the street, may afford a separate, office address. The opportunity may also exist for the ground floor space of buildings to be used for small galleries, arts and crafts and retail shops at key locations compatible with the residential neighbourhood. Commercial uses of this type are limited to 50 square metres in area and located on the ground floor only.

HOUSING FOR THE UNIVERSITY COMMUNITY

Innovative approaches are encouraged in the design of dwelling units to create rental suites for students, university staff and faculty. For example, townhouses might be designed with separate entries to allow for secondary suites in the Innovation Zone.

RESIDENT AMENITY SPACES

Individual projects shall include amenity space for the residents. Provision for amenity space is included in each site's respective land use. Communal outdoor space is encouraged and can be provided in the form of a rooftop terrace.

BUILDING FORM

BUILDING HEIGHT GRADIENT

Buildings in University District will range from two storeys for some street-fronting developments to sixteen storeys for important landmark sites. Buildings with a greater height along the street frontage are generally located north of University Avenue where views from existing, surrounding neighbourhoods will not be impacted.

TERRACED BUILDINGS

Terraced building forms are encouraged given the topographic nature of the site with its slopes to the west. Ground floor slabs should also terrace along sloping site frontages to ensure a better grade-oriented relationship of the building to the street.

BUILDING ORIENTATION

Buildings should generally align with the orthogonal grid of the University District streets. Exceptions are where buildings form the edge of curved streets in which case buildings should be oriented towards the street. Every effort should be made to orient buildings in an east-west alignment to improve on sustainable design, reducing energy requirements for lighting, heating and cooling, and ventilation. Building orientation should take into consideration the maximization of views from as many units as possible, particularly the longer views across neighbourhoods towards the south and west.

STREET FRONTAGE RELATIONSHIP

All buildings should relate directly to the streets on which they front or as defined in the Block Profiles in Appendix 1 with all businesses and other community services on ground floor accessible directly from sidewalks along a public space (e.g. street, square or plaza) but not a parking lot. All mixed use buildings along University Avenue shall include ground-floor retail along at least 60% of the street-level facade. All building facades along sidewalks should avoid blank walls by having windows and/or doors incorporated to create interest and enhance the pedestrian experience. At a maximum no more than 40% or 15m (whichever is less) of a building length should be blank. In all cases, the setback should ensure a strong streetwall and pedestrian environment. Mixed use and office building facades along University Avenue should be directly adjacent to sidewalks or equivalent provisions for walking.

Residential: Ground floor dwellings shall address the street through the use of front door entrances, gates and entry courtyards. Porches, patios or decks should be designed to establish a semi-private zone in support of a "porch culture" along the street. Windows and balconies at upper floor levels should face outward, adding to a sense of safety and security for the public domain. Entrances should create identity and a sense of address for buildings, dwelling units and stores. Residential uses at grade should be elevated no less than 0.61 metres above the sidewalk grade for comfort and livability. If no maximum setback is designated, those building facades which are street-facing should be set back no more than 5m.

Retail: Retail entrances should create an address and identity for the building. See sections "Definition of Retail Streets" and "Retail Frontages and Storefront Visibility" for further details.

Office: Office uses at grade should activate the street in which they front. This can be done by utilizing the architectural layout of the building. A minimum of 50% of the office buildings should include ground-floor retail along 60% of the length of the street level facade.

BUILDING SCALE ALONG STREETS

To create an appropriate scale along streets a building base element is encouraged. For residential buildings, this base should consist of two-storey "city-homes" with their primary entrance from the street. The lower floors of buildings will form part of the streetscape and are important to the public realm and pedestrian character of the street. Devices such as changes in material, extent and frequency of windows, and cornice lines should be used to achieve a comfortable pedestrian scale. Textured, high quality materials, more intensive decorative details and lighting should be used to enhance the close-up view for pedestrians while still maintaining privacy for residents.

BUILDING MASSING

Residential buildings above 4 storeys should consider the utilization of a stepback to create a podium base. The stepback should occur by the 4th storey to create a pedestrian scale along the street.

SEPARATION BETWEEN HIGHER BUILDINGS

Any portion of a building above 6 storeys in height should maintain a separation of 20 metres minimum from any existing, or approved, adjacent structure that is also higher than 6 storeys. There may be exceptions when buildings are not separated by a laneway or street. Townhouses and ground-oriented units on separate development parcels that have facing front entrances shall have a minimum separation between building faces of 12 metres.

USABLE OUTDOOR SPACE

A pattern of courtyards and enclosed spaces is inherent in the organization of the University District plan. Residential projects should take advantage of this concept to form new spaces. These courtyard areas should be usable by building residents as communal outdoor spaces.

ROOFTOPS FOR LIVING

Roofs and terraces should be used, where practical, for private and communal outdoor patios, decks, and roof gardens. Active roofs are encouraged and green roofs can be used as a means of retaining storm water from smaller storm events and to add visual interest. Where active uses are not available, roofs should be designed attractively.

DEFINITION OF RETAIL STREETS

The form of buildings along the retail high street should strongly define the street space. Upper floor setbacks for buildings along the retail street can be utilized to create a human-scale environment. Mixed-use buildings along the south side of University Avenue which are greater than 4 storeys should step-back at, or before, the 4th storey to create a podium base.

For all mixed-use buildings, balconies that protrude from the building are only permitted if the residential portion of the building steps back.No balconies should over hang the sidewalk or retail spillout zone at grade.

NARROW RETAIL FRONTAGES

The individuality of retail stores should be expressed through many stores of narrow frontages, with high quality storefront displays rather than wide, uninviting storefronts. Solid walls are to be minimized. Where possible, setback ranges should be minimized to achieve a streetwall consistency. Exceptions may be where small plazas or courtyards are included to add diversity and activity space in the streetscape. Inset doorways are acceptable, but should include extensive glazing throughout the entryway to preserve visibility from the sidewalk. Placement of signage, lighting, or architectural detail to help celebrate the location of individual inset doorways is encouraged. Narrow retail frontages will draw people along the high street as they move between stores.

STOREFRONT VISIBILITY

Shopping streets require sufficient presence and openness to establish their prominence as a generator of retail activity. To this end, the design of the store entrance and glazing system must be of a scale to invite shoppers inside. All ground-level retail that faces a public space shall have clear glass on at least 60% of their facades between the area of 1.0m – 2.24m above grade. Ground-level retail must be kept unshuttered at night

STOREFRONT TRANSPARENCY

Visibility into shops from the street shall be maintained at all times. Any solid signage, advertising or blackout panels placed against the inside surfaces of storefront glazing is prohibited. Interior equipment, such as pop coolers, shall not be directed towards storefronts and the street.

WEATHER PROTECTION

Weather protection can be utilized but is not required. If weather protection is provided along retail or mixed-use frontages of a building, it should be continuous. This cover may take the form of fixed, metal and/or glass canopies. Refer to Land Use Bylaw IP2007 and Signage Design Guidelines. Weather protection in the City right-of-way may require an encroachment agreement. If canopies are provided they must be designed and constructed to withstand the weight of snow and to prevent the creation of icicles. Precautions should be taken in the design to make sure when the snow sheds off the canopy it does not fall within pedestrian walkways.

PARKING STRUCTURES

The majority of parking should be located underground. With exceptions being street parking for retail, surface visitor parking for residential or enclosed surface parking for townhouses (if aligned with the rules of the Land Use District). Parkades should be designed to blend with the architectural design elements of the building. Quality wall finishes should be used as the architectural treatment on parkade walls. Above grade parking shall be concealed behind building frontages along public streets. Public (including visitor) and commercial parking should be fully separate from resident parking.

PARKING ENTRANCES

Ramps to underground parking should be perpendicular to the street that serves them, rather than parallel to the street frontage. Ramps should be concealed to the greatest extent possible within a building or through the use of overhead trellises and landscaping. Full cut-off lights shall be used to avoid spill-out of lighting into public spaces and to mitigate concerns for night sky pollution, with a full consideration of CPTED (Crime Prevention through Environmental Design) principles. Private garages in townhome developments shall be directly accessed from the lane or shared driveway at the rear of the units. Where secured visitor parking is provided in underground garages, access control shall be available at street level. Entrances to parking should be avoided off of University Avenue.

2.1.4 ARCHITECTURAL EXPRESSION

VERTICAL AND HORIZONTAL EXPRESSION

The architectural facades of buildings 4 storeys or less should make use of design elements that contribute to the human scale of street spaces. This might include expressing the vertical to create a rhythm of repeating elements and diversity in the facade. Buildings greater than 4 storeys should focus on the use of horizontal lines above the 4th floor as a contrast to lower floors. Design elements might include projecting roofs, trellises, sunscreens, extended wall planes and a horizontal expression in wall materials.

TOWERS MEET THE GROUND

Where towers are combined with a baseplane podium building a portion of the tower should extend down to grade rather than sitting atop the podium. This design approach is best accommodated at the entrance to the tower lobby and at the corners of blocks. For buildings 12 storeys or greater a Pedestrian level wind study should be completed.

DESIGN OF WINDOWS

An emphasis should be placed on the use of glass to maximize natural illumination within buildings while taking advantage of the magnificent outward views from this setting. Residential windows should be operable to maximize natural ventilation as part of the energy design of new buildings. The detailing of window elements is important to avoid a "tacked-on" appearance. The use of a rebate window, set into the façade, will create a more solid expression and increased shadow lines. Window types may include metal, wood, fiberglass and vinyl. Window wall glazing systems, with glass or metal spandrel panels, are acceptable in taller buildings (above 4 storeys).

ROOF FORMS

Roofs on taller buildings should generally be horizontal or a shallow slope as an appropriate response to the prairie environment. Roofs on townhouses, row houses, and smaller apartment buildings should incorporate horizontal roofs and/or shallow sloped or pitched roofs.

ARCHITECTURAL APPURTENANCES

Architectural appurtenances (or accessories) such as vertical elements may be added to buildings to provide visual interest, but shall be designed primarily to support green building initiatives, including light shelves, shading devices, solar panels, and ventilation fins. Vents, mechanical equipment rooms and elevator penthouses shall be integrated as part of the architectural treatment of roofs and should be screened from view to the greatest extent possible. Higher buildings should introduce articulation in the upper floors through the use of terracing and/or architectural appurtenances like trellises or vertical elements to create greater interest in the skyline. Architectural appurtenances incorporated should be considerate of Calgary winters in their design.

BALCONIES

Balconies should be maximized in area to provide usable outdoor space for dwelling units. They should be designed as an integral part of the building rather than appearing to be "tacked on". Balconies may not be enclosed following construction. In the event that an enclosed "solarium" is preferred to an open balcony, it should be incorporated as part of the initial design of the building. Balustrades around balconies should be transparent either through the use of glass or fine metal detailing. Balconies shall be sized according to the site's respective Land Use district.

BUILDING ENTRANCES

The sense of arrival to a building should be celebrated through the design and detailing of its entrance. For office and mixed use buildings the functional entries should occur at an average of no more than 75 ft.

2.1.5 BUILDING MATERIALS

There is a clear preference for wall cladding materials with sustainable properties. Brick is the material of choice to unify the community and to create the feel of a "village". This material should, as a minimum, be utilized in the first 2 storeys of all developments as a base finish. Cladding materials will vary by building type and are noted below as mid- and high-rise (typically greater than 4 storeys) or low rise (typically 4 storeys or less).

LOW RISE

The dominant structural material for all buildings 4 storeys and under in height is wood frame which should be carefully detailed to ensure durability. Cladding materials may include brick, metal panel, and fibrous cement board. Vinyl siding, plastic, and plywood are not permitted materials. Ground-oriented units such as townhouses and row houses should be clad in either brick, architectural wood, or fibrous cement board. Low-rise buildings may employ stucco as a cladding material, provided it is compatible with neighbouring developments. For residential buildings, a high percentage of wall glazing should be avoided in low-rise buildings to better fit with a residential vernacular.

MID-RISE/HIGH-RISE

The dominant structural material for buildings over 4 storeys in height will be concrete for reasons of durability, sound transmission, fire rating, and continuity with the community design. Exceptions may be made for up to six-storeys, with the dominant structural material of wood, if permitted by the building code. Concrete should be of high fly ash content for sustainability, whenever possible. Cladding materials may include in-situ concrete, pre-cast concrete, brick, stone, stucco and metal panel products. Ground-oriented and podium units should endeavour to use brick. Stucco and EIFS (Exterior Insulated Finish Systems) should not be used as the principal wall material at lower levels of the building, but may be appropriate at upper levels. All references to stucco in this document refer to traditional three coat cementious stucco. Vinyl siding, plastic, and plywood are not permitted materials.

More detailed criteria for building materials is included on the following pages:

In-situ concrete

- Where used structurally, in-situ concrete should be expressed on the exterior of a building in the form of a grid, band, or load-bearing wall.
- Concrete left exposed should have a high-quality architectural finish, or sand blasted finish.
- Concrete may be tinted, stained or painted, subject to colour selection.

Pre-cast concrete

- Pre-cast concrete may be used as wall cladding or limited to details for window and door sills, base and fascia elements.
- Finishes should be consistent with the colour palette selected for the main wall treatment.

Brick

- Brick is most appropriate when it is expressed as a load-bearing material.
- The use of precast concrete sills and headers is encouraged in brick buildings to create a high quality finish.

Stone

- Stone base elements are encouraged in the lower walls of buildings. This material is encouraged in new developments for both building and landscaping walls.
- The type of stone selected may be split-face or smooth-cut squared or ashlar applications. Polished-face stone is generally not considered appropriate nor is cultured stone.

Metal

- High quality metal panel systems may be utilized as a wall and fascia material. Products are to be of an equal quality to Alucabond.
- The finish of such panel systems can be anodized or factory-finish painted.

Steel and Aluminum

- Steel is an appropriate material for finishing details such as rails, grates, privacy screens, fascia and banding elements, trellises and canopies.
- Aluminum is most appropriately used for window construction, balcony railings and gates.

Stucco

- Stucco should only be used as a secondary wall finish and should not constitute more than 50% of the exterior finish of the building.
- Stucco must not be used at the lowest level of buildings, especially along streets and public rights of way.

Fiber Cement Siding

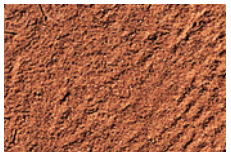
- may be a primary siding for townhouse and rowhouse projects;
- styling should be limited to simple applications of smooth-faced siding with no shapes or replicated wood grains; and
- horizontal applications are typically preferred.

FINISHING TECHNIQUES

Exterior materials should be finished in a manner that retains their colour and quality over time. Staining and painting are acceptable subject to colour. Scheduled maintenance is required to ensure that finishes last.

COLOUR

The palette of colours for University District should generally be "warm", with "grey content". Warm-grey, charcoal, taupe, grey-green, buff and ochre characterize a colour palette that fits with the campus context while increasing the feeling of warmth, appropriate for a primarily residential environment. A range of accent colours can be used on detailed building elements. Colours should be carefully considered to ensure a building's ability to fit within the context of the community yet also showcase its individuality.



RESIDENTIAL LIVABILITY

BUILDING SETBACKS

Privacy for grade level units should be enhanced through low walls, hedges and changes in elevation. Buildings should be separated by a layering of landscaping elements such as low walls, hedges and/or tree rows. Buildings should be designed to avoid overlook problems between units facing one another. Windows located in sideyards should take into account those located in existing or approved adjacent developments.

CHILDREN'S PLAY AREAS

Children of all ages should have easy access to appropriately located, designed and landscaped outdoor play areas suited to their developmental and play needs. Where a site is providing a play area as part of the common property, the total outdoor play area shall be a minimum of 130 square metres in size and shall be visually accessible from amenity areas and residential units. Outdoor play areas shall be situated to maximize sunlight access. There should be a minimum of 2 hours of sunlight between the hours of 10:00 a.m. and 5:00 p.m. on December 21st and adequate artificial lighting shall be provided. The anticipated demographic of a building will impact the encouragement of a play area.

PRIVACY OF OUTDOOR SPACES

Each dwelling unit should have direct access to a private outdoor space in the form of a balcony, patio or roof deck as outlined in Land Use Bylaw IP2007. Adjoining balconies should be separated with a privacy screen. Where outdoor spaces are terraced, screening should be employed to minimize the extent of overlook from one patio to another.. Courtyard spaces should be usable by building residents as communal outdoor spaces.

IDENTITY

The ground floors of all buildings should be designed to express the individuality of units through architectural expression and the inclusion of entrance doors and windows addressing the street. Private outdoor spaces should be capable of being customized by residents through their choice of plant materials, potted plants, window boxes and furnishings.

SAFETY AND SECURITY

Residential developments and unit designs should be safe and secure from on-street access. Public and semi-private outdoor spaces should have some degree of overlook from residential units and good visibility from the street. Landscaping should be illuminated to enhance security. CPTED (Crime Prevention through Environmental Design) principles should be incorporated into building and site design. To raise the sense of security and comfort within parking garages, they should be well illuminated, painted, have good view lines throughout, and make use of glazing in lobbies and at entrances.

ACCESSIBILITY AND ADAPTABILITY

Many older people prefer to remain in their home for as long as possible. To this end, housing units should be designed to be adaptable to the future needs of residents as they age. Particular consideration should be given to CMHC "Flex Housing" design guidelines. Access to all residential common spaces and primary external circulation routes should be designed to be accessible to those persons impaired by vision, hearing, or mobility. Street-oriented units elevated above the sidewalk grade can be an exception to this requirement, but should provide opportunity for adaptability for accessibility requirements to not preclude aging in place and future users of these units.

SOLAR ORIENTATION, LIGHT, & VENTILATION

Habitable rooms in dwelling units should have access to daylight and direct sunlight. Private and semi-private outdoor spaces should receive direct sunlight during most days of the year. Outdoor spaces related to north-facing units will require careful design for sun access. Each external facing residential room shall have operable windows for increased natural ventilation.

MULTI-LEVEL UNITS

Inclusion of some two- or three-storey units, particularly at street level, will afford the opportunity for residents to have units that are more "house-like". This unit type also lends itself to flexibility of use for the ground floor, allowing for the inclusion of a home office or studio space.

RECYCLING AND GARBAGE

Provision for a full recycling program and for residential waste should be made for each building. Garbage holding areas should be contained within buildings either at grade or in underground parking areas or in a garbage container enclosure. Townhome sites may have a separate garbage enclosure as approved by the development authority. Enclosed areas are to be properly ventilated, enclosed behind operable doors, and equipped for full sanitary management. Space in garbage holding areas should provide additional space for future compost collection.

INTENT

The purpose of these signage guidelines is to provide general direction to regarding the type and design of signs at to be utilized in the University District community. The guidelines will be administered by West Campus Development Trust (WCDT) through the design review process as outlined in Part 1. Rules regarding signage outlined in Calgary's Land Use Bylaw IP2007 will apply and approval by the City of Calgary is required. Applicants will require WCDT approval of their Comprehensive Sign Plan, prior to making an application to the City.

COMPREHENSIVE SIGN PLAN

The Comprehensive Sign Plan will provide information on the future parcel's signage including the size, type, location, and number of signs.. The design, placement and colour of the signs shall be coordinated with the architectural elements of the building and take into consideration the intent of the signage design guidelines discussed below. No permanent sign shall be placed on a parcel until a Comprehensive Sign Plan has been submitted and approved, in the first instance by WCDT and, ultimately, by the City of Calgary.

The Comprehensive Sign Plan shall consider:

- the conformance of the proposed sign(s) with Calgary's Land Use Bylaw IP2007;
- the conformance of the proposed sign(s) with the design guidelines; and
- the consistency of the plan with signs on adjoining parcels.

RESIDENTIAL SIGNAGE

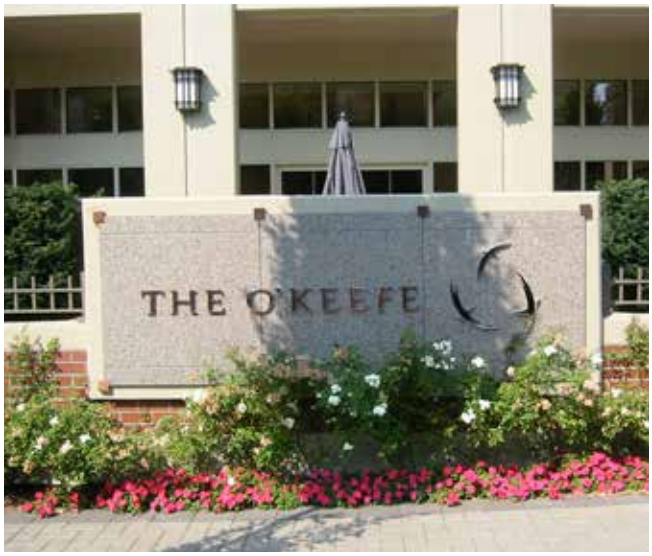
LOCATION

Residential building identification signage should be illuminated, indicating the street address in a discreet, graphic style. Signage should be closely related to the principal building entrance and generally placed in low wall elements. This signage could be free-standing on supports or embedded in a building or landscaping wall.

CONTENT

The graphic content of a residential sign shall be limited to one or more of the following elements:

- project name;
- project logo; and
- street address number.



COMMERCIAL RETAIL SIGNAGE

Commercial signage should add diversity and interest to retail streets. Blade signage is encouraged and should be mounted perpendicular to the retail frontage so that they are visible to pedestrians walking along the sidewalk to create a consistent aesthetic. Retail tenants will be able to utilize their brand logos and colors, hanging them on standard hardware that is consistent along the entire street. Signs should be clearly visible from a pedestrian's point of view and not so large that they are overbearing and dominate the streetscape.

FASCIA SIGNS

Fascia signs are permitted subject to the following:

- individual letter type only
- three-dimensional structure to letters
- maximum letter size 600 mm
- neon or halo-type rear illumination, or front illumination with billboard-type light fixtures
- back-lit, plastic fascia sign boxes are not permitted

AWNING SIGNS

Signs on awning drops are permitted subject to the following:

- maximum awning drop/skirt of 400 mm in depth
- painted or vinyl applied lettering, or incised lettering with applied backing
- no rear lighting is to be installed under awnings
- no signage or graphic material on any sloped, curved or vertical portion of an awning other than on a drop, as described above

HANGING SIGNS/BLADE SIGNAGE

Hanging signs are permitted subject to the following:

- minimum clearance of 2.4 metres from grade
- maximum area of 0.5 square metres
- mounted within the frontage of the premises, or over, awnings and canopies
- Ground floor retail should include one blade sign to provide wayfinding at the pedestrian level.

WINDOW SIGNS

Window signs are permitted subject to the following:

- maximum area 0.5 square metres
- paper, cardboard, plastic or fabrics are not permitted for window sign construction with the exception of cut-out vinyl, surface-applied to inside of glazing
- no back-lit signs, displays, or product machines may be visible through store windows
- neon is acceptable when installed on the inside of glazing

BUILDING DIRECTORIES

Directories are permitted subject to the following:

- maximum area of 1.0 square metre
- located at the front entrance of building
- directories should take into consideration the community brand.

NUMBER OF SIGNS

A maximum of one sign per 8m is permitted per business.

LIGHTING

Signs may incorporate front-lighting for their illumination and limited use of rear lighting provided it is restricted to:

- individually-incised, plastic or glass letters or symbols mounted in a solid, opaque sign face
- individual halo-lit lettering or symbols mounted on a solid, opaque background
- neon illuminated signs

MATERIALS

Exposed surfaces of signs may be constructed of any material with the exception of fibreglass, plywood and particle board.

COLOUR

Signage colour must be coordinated with the materials and colours of the building façade with which it is associated.

HEIGHT

Signs must be located no higher than the finished second floor level of a commercial building. Signs located over pedestrian areas or sidewalks shall have a minimum clearance of 2.4 m from grade.

LETTERING

The maximum permitted lettering size on any sign is 450-600 mm. Symbols are encouraged depicting the nature of the business occupation in the premises.

SANDWICH BOARD SIGNS

Sandwich boards signs shall be constructed of wood or metal. Each of the two panels shall be no larger than 1m^2.

EXCLUSIONS

Commercial signage types that are not permitted include:

- pylon signs
- back-lit sign boxes
- billboards
- revolving signs*
- banners, pennants, bunting, flags (other than national, provincial, municipal flags), balloons or other gas-filled inflatable devices
- roof signs
- changeable, copy signs

*Revolving signs may be considered but are dependent on the discretion of the review team and rationale for the sign.

OFFICE SIGNAGE

Any office tenancy signage requests should be directed to the design review team.

The Site Design Strategies ensure that the site design aligns with the vision for the community including prioritizing pedestrian experiences and accommodating landscape design elements which improve the experience of users.

LANDSCAPE DESIGN ELEMENTS

WALLS

The design of hard landscape elements should relate to the style, materials, and colours of the architecture on individual development sites. Materials used in the landscape for walls, metalwork, and structures should share a similar design expression, range of colour, and style to the architecture on the same site. Landscaping walls should make use of brick as a finish surface. Wall caps should be stone, pre-cast or in-situ concrete. Precast concrete unit planters, walls and retaining walls should not be considered.

PAVING

Pavers should generally be used in hard surface areas. Where feasible, consideration should be given to the use of 'pervious pavers' that allow water to infiltrate through joints. Preference should be given to a colour range that complements the buildings, including grey, taupe, and charcoal, rather than red or orange. The choice of paver colour, texture and pattern should complement any pavers being used within the street right-of-way.

SPECIAL FEATURES

Landscape features should mark entry points and special places:

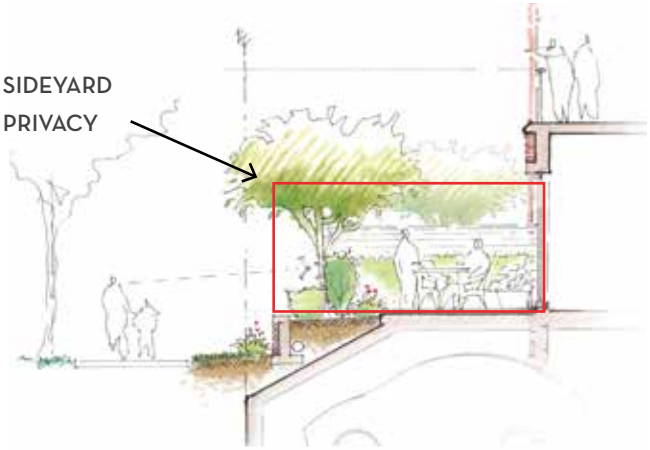
- Flowering plants can be used for emphasis within the overall landscape context.
- Storm water collection areas should be designed as landscape features and integrated into the open space program.

SITE RE-GRADING

In many locations re-grading of the site to meet street construction grades and underground parking structures will result in changes from the existing topography. These variations should be taken up with planted berming or terraced landscaping utilizing brick or concrete retaining walls with planting.

SIDEYARD PRIVACY

Where developments have units with windows or outdoor patios facing a sideyard, privacy should be enhanced through the use of fences or hedges with a maximum height of 1.8 metres. The design of all privacy fences are to be integrated with the building architecture.



SEMI-PRIVATE FUNCTIONAL OUTDOOR AREAS

Opportunities to incorporate semi-private 'shared' open spaces within the residential parcels can be realized in a number locations and with a variety of spatial sizes and functions. The most physically and visually accessible areas would be directly above the parking structure, in the interior courtyard area and directly accessed from the first (ground) floor of the surrounding development. Other possible locations would be within the street setback in association with the entry sequence to lobby or indoor amenity room. And the final location would be on the higher roof terraces in combination with possible green-roof systems.

What all of these spaces have in common is their role in providing outdoor areas that promote social interactions with neighbours and community members, and with each of these locations, particular criteria and objectives need to be considered:

- Shared outdoor areas should be programmed for use by residents and to promote social interaction among neighbours. Opportunities for small children's play, seating, and outdoor eating or BBQ areas should be considered.
- Consideration towards providing adequate growing medium depths and appropriately designed and installed building envelopes/roof membrane systems to achieve lush and healthy plantings to establish and thrive over the life of the building.
- Sustainable landscape opportunities should be incorporated including communal gardening areas with composting, shared tool storage and water/hose bib access.
- Both sunny and shaded areas could be provided, with arbours or trellis structures that create shade. Such structures also reduce the overlook issue from surrounding residential units.
- Outdoor amenity areas should have direct association with indoor amenity spaces wherever possible.

PRIVACY AND OVERLOOK

- Landscape elements should be designed to preserve privacy of units and individual outdoor spaces.
- Views from windows of surrounding buildings should be provided into the semi-private open spaces, especially to areas designed for children's play.
- When locating outdoor amenities, such as seating areas, outdoor eating and/or BBQ areas, it is important to site them in the shared semi-private areas to minimize potential conflicts between users of the space and nearby residential units.

PRIVATE OUTDOOR SPACES

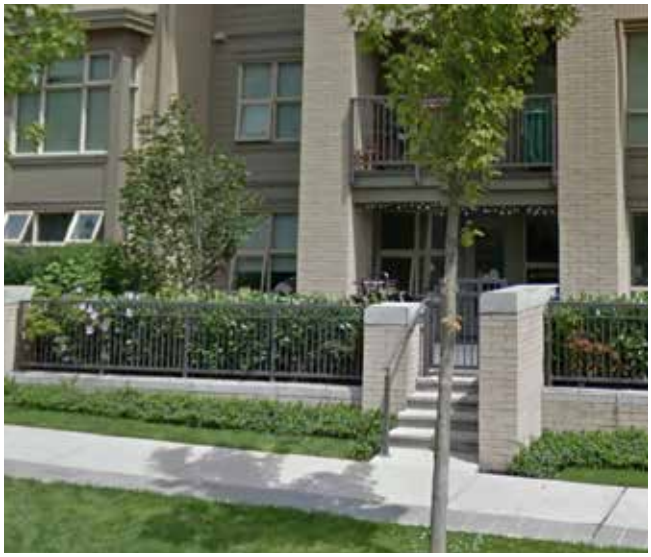
PATIOS

Private outdoor patios for ground floor units should be large enough to permit patio gardening and use of table and chairs. Private patios should be buffered through changes in elevation, hedges, low walls, or other measures.

VISUAL BUFFERING

Landscape elements should be used to provide visual buffers:

- Trees should be planted between units for visual privacy.
- Plant material, berms, and hard landscape elements should be used to screen views to service areas, surface parking, parking structures, and utility boxes.
- Plant material should be selected to achieve a mature scale that will limit future view impacts.
- A mix of evergreen shrubs and deciduous hedge planting and small trees should be used to provide privacy for patios and outdoor spaces. Maximum height of hedges, measured from patio level should not exceed 1.5 metres.



LEED ND Requirements

LEED for Neighbourhood Development is a certification identifies a set of measurable standards which are considered collectively to determine whether a development or proposed development "can be deemed environmentally superior, considering the development's location and access, its internal pattern and design, and its use of green technology and building techniques. This approach allows for a comprehensive evaluation of a neighbourhood as a whole.

University District is LEED-ND certified. The following LEED-ND requirements are for each of the individual development sites to meet. There are additional LEED-ND requirements which are integrated throughout this Manual in the elements discussed such as Mobility Plan, Innovation and Building Design.

STORM WATER MANAGEMENT LEED ND GIBc8

All projects will be required to develop a plan that integrates the on-site stormwater management system with the neighbourhood wide stormwater management strategies, including controlling the rate and/or quantity of run-off. The overall University District community is required to retain 90.2% of all the rain that falls on site. This is both a LEED-ND and City of Calgary target. The stormwater management plan shall include Best Management Practices (BMPs) selected from The Washington State Department of Ecology's Stormwater Management Manual for Western Washington, Volume V, Runoff Treatment (2005 edition), or from a locally approved equivalent standard (if a local standard is used, then a description of its equivalency and of how the local standard more appropriately addresses local stormwater management shall be provided). Within the plan, BMPs shall be organized by infiltration, reuse, and/or evapotransporation. The plan shall include operations and maintenance elements (season-specific elements included), as well as a site plan indicating the locations of BMPs and drainage areas.

LIGHT POLLUTION REDUCTION LEED ND GIBc17

Lighting is required to meet the requirements outlined in Part 3 Division 4 in the Land Use Bylaw IP2007.

To reduce light pollution, projects shall also meet the following requirements:

1) In residential areas, at least 50% of the external luminaires will have fixture-integrated lighting controls that use motion sensors to reduce light levels by at least 50% when no activity has been detected for 15 minutes.

2) In shared areas (spaces and facilities dedicated to common use, whether they be publicly or privately owned):

- All shared area lighting will have automatic controls that turn off exterior lighting either when there is sufficient daylight or when it is not needed during nighttime hours; these lights must meet the total exterior lighting power allowance requirements in Table 3 (See Appendix 3).
- All shared area lighting will meet the light trespass requirements of the adjacent lighting zone, as per Table 1 and Table 2 (See Appendix 3).
- All shared area lighting will meet the uplight limitations of the most stringent lighting zone within or adjacent to the project.
- All non-exempt shared area lighting will meet the total lighting power density (LPD) requirements of the applicable lighting zone.

Compliance with the light trespass requirements may alternatively be met by using only luminaires that comply with Table 4 (See Appendix 1) ratings for backlight and glare.

WASTE, RECYCLING, AND COMPOST COLLECTION

LEED ND GIBc16

Provide for collection and removal of domestic paper, cardboard, plastic, glass, and metal recyclables. Recycling storage space shall be designed in accordance with the City of Calgary's current Waste & Recycling Service Requirements.

A collection point shall be planned for composting materials. Implementation of compost collection will occur at such time as the City of Calgary opens a compost facility.

BICYCLE PARKING AND STORAGE LEED ND SLLc4

Provide enclosed facilities for storing and/or securing bicycles as specified below or as per Land Use Bylaw IP2007 (whichever is greater):

For **multi-unit residential buildings** (consisting of 4 or more residential units sharing a common entry), provide bike storage for 30% of planned occupancy, and 1 outdoor bike rack per 10 units (minimum 4 per site).

For **retail**, provide bike storage for 10% of retail worker planned occupancy, and 1 outdoor bike rack per 5,000 feet of retail space (minimum 1 per business or 4 per site, whichever is greater). At least one on site shower with changing facility shall be provided for any development with 100 or more workers, with an additional shower for every 150 new workers thereafter.

For **nonresidential** other than retail, provide bike storage for 10% of planned occupancy, and 1 outdoor bike rack per 10,000 feet of non-retail space (minimum 4 per building). At least one on site shower with changing facility shall be provided for any development with 100 or more workers with an additional shower for every 150 new workers thereafter.

Enclosed bicycle storage shall be secured and informational signage on using the storage facilities shall be provided to residents and/or workers.

Provide unsecure bicycle parking (bicycle parking Class 2) as per the Land Use Bylaw IP2007. Unsecure bicycle parking shall include the following features:

- Clearly visible from primary entrance of building served
- Night lighting
- Protected from damage from motor vehicles
- Located within 30 m of building served, including proportionate distribution of spaces within 30 m of multiple entries to a single building.

A bicycle repair station may be provided within the building.

PARKING LEED ND NPDc5 LEED ND NPDc8

For non-residential and multi-unit residential buildings, either do not build new off-street parking lots, or locate all new off-street parking lots at the side or rear of buildings, leaving building frontages facing streets free of surface parking lots.

As per LEED-ND criteria no more than 20% of the total development footprint area of each parcel can be used for all new off-street surface parking facilities, and no individual surface parking lots larger than 2 acres. Surface parking includes ground-level garages unless they are under habitable building space. Underground or multi-story parking facilities can be used to provide additional capacity, and on-street parking spaces are exempt from this limitation.

There are no areas within the University District community which allow for this amount of permanent surface parking. Parking should follow the guidelines set out in Building Form section.

Carpool and/or shared-use vehicle parking spaces equivalent to 10% of the total automobile parking for each nonresidential and mixed-use building on the site shall be provided. Signage indicating such parking spots shall be provided, and the parking spots shall be within 60 m of entrances to the buildings served.

WATER EFFICIENCY REQUIREMENTS FOR ALL BUILDINGS

LEED ND GIBp3 LEED ND GIBc3

- **Residential**: All residential buildings must achieve a 40% water savings compared to the following baseline numbers:
  - » **Toilet**: 6.0 LPF at 414 kPa
  - » **Bathroom faucet**: 8.3 LPM at 414 kPa
  - » **Kitchen faucet**: 8.3 LPM at 414 kPa
  - » **Showerhead**: 9.5 LPM at 552 kPa per shower stall

- **Nonresidential**: All nonresidential buildings must achieve a 40% water savings compared to the following baseline numbers:
  - » **Toilet**: 6.0 LPF (except blow-out fixtures: 13.2 LPF)
  - » **Urinal**: 3.8 LPF
  - » **Bathroom faucet (private, i.e. hotel rooms):** 8.3 LPM at 414 kPa
  - » **Bathroom faucet (all other non-private):** 1.9 LPM at 414 kPa
  - » **Bathroom faucet (metering faucets):** 0.95 L per cycle
  - » **Pre-rinse spray valve (for food service):** flow rate equal to or less than 6.0 LPM

WATER EFFICIENT LANDSCAPING LEED ND GIBc4

Reduce water consumption for outdoor landscape irrigation by 50% below the midsummer baseline case, as defined by the Landscape Architect (or other responsible authority) for the parcel after the 18-month plant establishment period. The following strategies should be used:

Design and install a water-efficient irrigation system that includes an automated controller, rain or soil sensors, and a pressure regulator. For non-grass areas use a micro- or drip-feed irrigation system.
Maximize the use of drought Tolerant Plants suitable for Calgary's zone 3 plant hardiness climate, to be used in landscaped areas where appropriate.

Consider the microclimatic conditions are each site and group plants with similar needs together.
Do not mound or slope planting beds, which can decrease the water absorption during irrigation or during a rainfall.

Provide a nutrient-rich water retentive and well-drained soil mix of sufficient depth in the planting beds.

Consider planting in rain gardens, stormwater infiltration areas and bio-retention areas to reduce irrigation requirements.
Planting beds are be mulched to a 75 mm depth to reduce loss of water by evaporation.

Grass coverage is not to exceed a maximum of 50% of the total soft and/or vegetated landscaped area within the property line.
Pervious paving specified for a minimum of 50% of all hard surfaces, including driving surfaces, decks, and patios that reside over soils (not over parkade slab). Impervious surfaces that are clearly drained to a pervious area of landscaping or to storage for irrigation use can be included in the 50% calculation.

ENERGY EFFICIENCY REQUIREMENTS FOR ALL BUILDINGS

LEED ND GIBp2 LEED ND GIBc2

- All buildings 4 storeys and higher are required to achieve a 26% energy cost savings when compared to ASHRAE 90.1-2007, using the Performance Rating Method outlined in Appendix G of the Standard.
- All buildings 3 storeys and lower are required to meet a Home Energy Rating System (HERS) index score of 75 or an EnerGuide Rating System (ERS) index score of 82. *required to demonstrate

ENERGY MODELING

All buildings shall undertake an energy modeling study early in the design process. The energy modeling results should include heating and cooling loads, annual energy use and energy cost, peak electric demand, percentage improvement against ASHRAE 90.1-2007, carbon emissions, and impacts on daylighting.

The energy modeling study should include the following, where applicable:

- Passive heating, cooling, and ventilation strategies
- Massing and orientation for maximum access to daylight and minimum demand for heating and/or cooling
- Renewable energy opportunities
- HVAC system types
- Daylight analysis and associated lighting and cooling energy savings
- Envelope R-value (roof, wall and glazing)
- Impact of reduced glass area if window to wall ratio exceeds 40%

As per the design review process outlined in Part 1, developers will be required to submit an Energy Model (summary and output files) at the design review stage.

EROSION AND SEDIMENTATION CONTROL LEED ND GIBp4

The preparation and implementation of a site Erosion and Sedimentation Control (ESC) plan is required for all new construction activities associated with the parcel. The ESC plan shall include Best Management Practices (BMPs) that are either selected from the Washington State Department of Ecology's Stormwater Management Manual for Western Washington, Volume II, Construction Stormwater Pollution Prevention (2005), or from a more stringent agency standard (if an alternative standard is used, a description of it's greater stringency shall be provided). The ESC plan shall list the BMPs employed and describe how the following objectives will be accomplished:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including but not limited to stockpiling of topsoil for reuse.
- Prevent sedimentation of any affected stormwater conveyance systems or receiving streams.
- Prevent polluting the air with dust and particulate matter.
- In addition, the ESC plan shall describe how the project team will do the following:
- Preserve vegetation and mark clearing limits.
- Establish and delineate construction access.
- Control flow rates.
- Install sediment controls.
- Stabilize soils.
- Protect slopes.
- Protect drain inlets.
- Stabilize channels and outlets.
- Control pollutants.
- Control dewatering.
- Maintain the BMPs.
- Manage the erosion and sedimentation control plan.

WASTE MANAGEMENT PLAN LEED ND GIBp16

A construction waste management plan shall be provided to ensure a minimum of 50% diversion of nonhazardous construction and demolition debris (excluding excavated soil and land-clearing debris) by weight from the landfill, including provision for waste separation.

APPENDIX 1

LIGHT POLLUTION REDUCTION

	ND
Credit	GIB Credit 17
Points	1 point

Intent

To minimize light trespass from *project* sites, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction, and reduce adverse effects on wildlife environments.

Requirements

"Shared areas" of a project are spaces and facilities dedicated to common use (publicly or privately owned).

In residential areas, at least 50% of the external luminaires must have fixture-integrated lighting controls that use motion sensors to reduce light levels by at least 50% when no activity has been detected for 15 minutes.

AND

In all shared areas, install automatic controls that turn off exterior lighting when sufficient daylight is available and when the lighting is not required during nighttime hours; these lights must meet the total exterior lighting power allowance requirements in Table 3.

AND

Document which lighting zone or zones (Table 1) describe the project, and for all shared areas, follow the requirements in Table 2. If two or more different zones border the project, use the most stringent uplight requirements, and use light trespass requirements for the adjacent zone. Roadway lighting that is part of the project must meet the requirements for the appropriate zone.

For illuminance generated from a single luminaire placed at the intersection of a private vehicular driveway and public roadway accessing the site, project teams may use the centerline of the public roadway as the site boundary for a length of two times the driveway width centered at the centerline of the driveway when complying with the trespass requirements.

Compliance with the light trespass requirements may alternatively be met by using only luminaires that comply with Table 4 ratings for backlight and glare.

AND

Stipulate *covenants*, *conditions*, *and restrictions* (CC&R) or other binding documents to require continued adherence to the requirements.

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Table 1. Lighting zones

Zone	Definition
LZ0	Undeveloped areas within national parks, state parks, forest land and rural areas and sites immediately adjacent to areas officially recognized as ecologically sensitive by the local zoning authority.
LZ1	Developed areas within national parks, state parks, forest land and rural areas.
LZ2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use, and residential mixed-use areas.
LZ3	All other areas not included in LZ0, LZ1, LZ2, or LZ4 (including commercial-industrial and high-density residential).
LZ4	High-activity commercial districts in major metropolitan areas (as designated by local jurisdiction, such as local zoning authority).

Table 2. Allowable light trespass and uplight, by lighting zone

Lighting zone	Maximum horizontal and vertical illuminance (fc) at site boundary	Maximum horizontal and vertical illuminance (fc) at specified distance beyond site boundary	Maximum percentage of fixture lumens emitted above 90° or higher from nadir (straight down)
LZ0	0	0 at 0 ft.	0%
LZ1	0.01	.01 at 0 ft.	0%
LZ2*	0.10	.02 at 10 ft.	1%
LZ3*	0.20	.05 at 15 ft.	2%
LZ4*	0.60	.05 at 15 ft.	5%

fc = footcandle.
* In LZ2, LZ3, and LZ4, for project boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the project boundary.

Table 3. Allowable lighting power densities, by lighting zone

	Lighting zone				
	LZ0	LZ1	LZ2	LZ3	LZ4
All exterior improved areas (except those listed below)	0.04 W/sf	0.04 W/sf	0.06 W/sf	0.10 W/sf	0.13 W/sf
Walkways	0.7 W/lf	0.7 W/lf	0.7 W/lf	0.8 W/lf	1.0 W/lf
Landscaping	No allowance	0.04 W/sf	0.05 W/sf	0.05 W/sf	0.05 W/sf
Entrance door (per linear foot of doorway)	20W	20W	20W	30W	30W
Entry canopy	0.25 W/sf	0.25 W/sf	0.25 W/sf	0.40 W/sf	0.40 W/sf
Illuminated building façade	No allowance	No allowance	2.5W/lf	3.75W/lf	5.0W/lf

sf = square feet; lf = linear feet.
Note: The total exterior lighting power density allowance for all shared exterior applications is the sum of the specified allowances for individual illuminated areas. The following lighting is exempted when its controls meet the above requirements and are independent of the controls for nonexempt lighting:
a. Specialized signal, directional, and marker lighting associated with transportation.
b. Advertising and directional signage.
c. Lighting integral to equipment or instrumentation and installed by its manufacturer.
d. Lighting for theatrical purposes, including performance, stage, film, and video.
e. Lighting for athletic playing fields.
f. Temporary lighting (installed for no more than 30 days and then removed for at least 30 days).
g. Lighting for industrial production, material handling, transportation sites, and associated storage areas.
h. Theme elements in theme or amusement parks.
i. Lighting to highlight features of public monuments and registered *historic buildings* or landmark structures.

Alternative method for meeting light trespass requirements in Table 2

A luminaire may be used if it is rated as follows according to the lighting zone of the site. If the luminaire is installed in other than the intended manner, the rating must account for the actual photometric geometry. An exception applies if at least 98% of a luminaire's emitted lumens are intercepted by man-made structures within the project. In either case, luminaires equipped with adjustable mounting devices permitting alteration of luminaire aiming in the field are not permitted.

Table 4. Allowable backlight and glare, by lighting zone

	Lighting zone				
Backlight luminaire rating	LZ0	LZ1	LZ2	LZ3	LZ4
> 2 mounting heights from property line	B0	B1	B2	B3	B4
1 to 2 mounting heights from property line and properly oriented*	B0	B1	B2	B3	B3
0.5 to 1 mounting height to property line and properly oriented*	B0	B0	B1	B2	B2
< 0.5 mounting height to property line adjacent to street and properly oriented*	B0	B0	B1	B2	B2
< 0.5 mounting height to property line and properly oriented*	B0	B0	B0	B1	B2
Glare luminaire rating	G0	G1	G2	G3	G4

* The luminaire must be mounted with backlight toward the property line.
Note: Backlight and glare ratings are defined based on specific lumen limits for IESNA TM-15-07 solid angles, Addendum A.