REPORT

Canyons Outline Plan

Original Approved November 2009 Adjustment Approved February 2011 Submitted November 2017

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REPORT

Preface

Melcor Developments Ltd. And Associated Engineering Alberta Ltd. Have prepared this report in support of an amendment to the approved Canyons Outline Plan. The approved Canyons Outline Plan was previously prepared by AECOM Canada Ltd. and completed November 2009.

The following document includes the original outline plan text with additions, changes and deletions where required, to support the proposed changes to the planning document.

All of the original outline plan text is shown in black. Where the original text has been changed or replaced, or where additional information has been added, text is shown in Green.

Submission #7

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REPORT

1 Introduction

1.1 PURPOSE

The purpose of The Canyons Outline Plan (the "Plan") is to establish a framework for the future subdivision and development of lands within the City of Lethbridge known herein as "The Canyons" (see Figure 1).

Based upon the planning principles and objectives within the Mountain Heights/RiverStone/River Bend Area Structure Plan (ASP), The Canyons Outline Plan contains a detailed development concept for the 140.22-hectare plan area that outlines land use intensity, municipal infrastructure, vehicular and pedestrian circulation, and development staging.

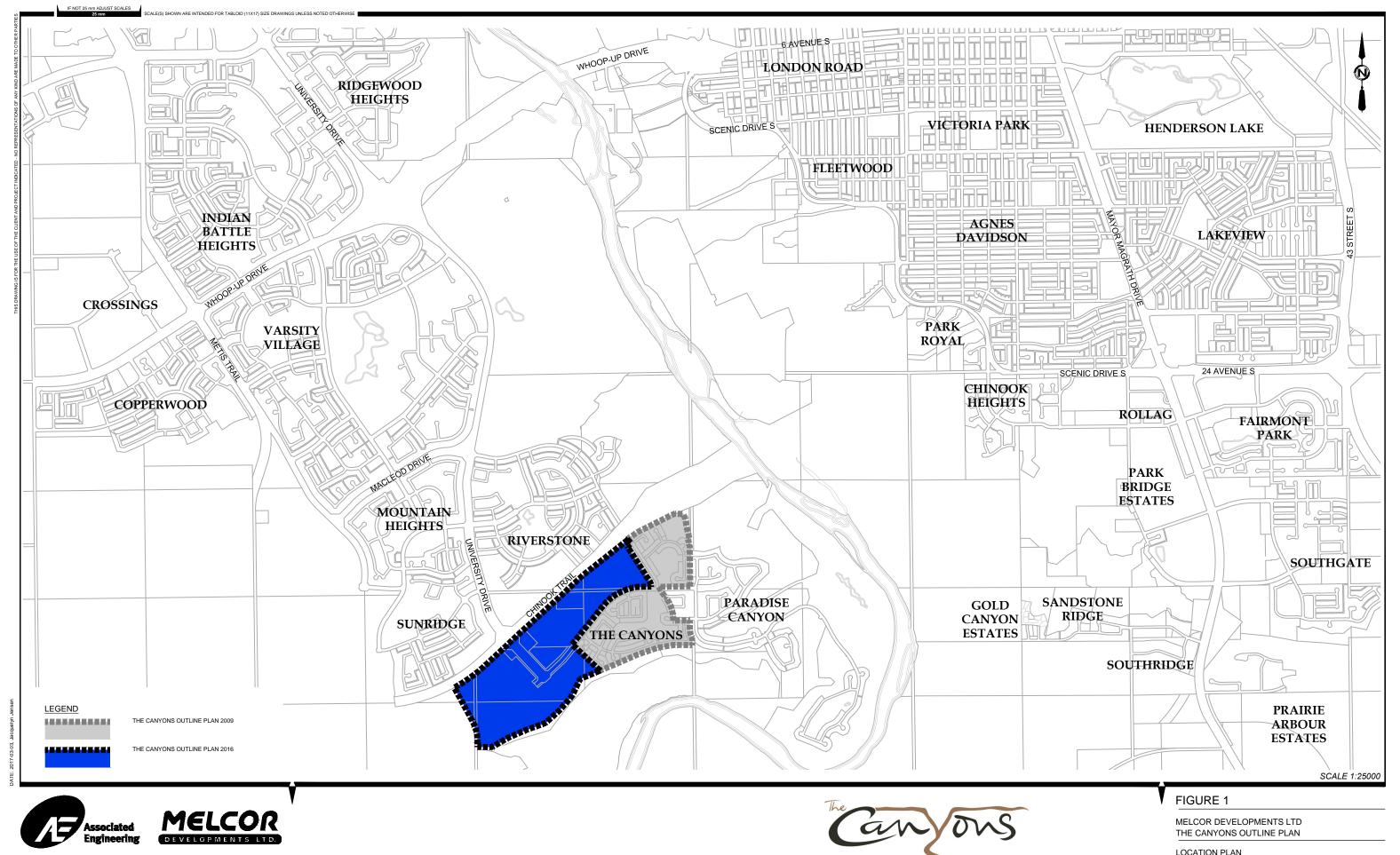
It is important to note that "The Canyons" is the development advertising name for the legally entitled River Bend development within the Mountain Heights/RiverStone/River Bend ASP. For clarification, the advertising name shall be used within this Plan. The Canyons Outline Plan was prepared to comply with requirements set forth in the adopted Mountain Heights/RiverStone/River Bend ASP and is consistent with the City of Lethbridge Design Standards 2008 Edition.

The original Canyons Outline Plan was completed in 2009. Since that time, the Plan has undergone a land use update to amend the removal of a future school site and the subsequent redistribution of land to various uses including Parks and Recreation, residential, and commercial.

1.2 DEVELOPMENT OBJECTIVES

The intent of The Canyons Outline Plan is to create an attractive, livable and diverse residential neighbourhood which complements and enhances the greater community. As such, the development of The Canyons has been guided by the following key objectives:

- To provide a range and variety of affordable and attractive housing to various demographics to meet current and future market conditions
- To provide a safe and convenient internal roadway system that allows access to University Drive, Chinook Trail and adjacent neighbourhoods, linking efficiently with future transportation and circulation systems
- To achieve orderly and economical servicing which responds to existing site conditions and logical staging
- To create a variety of pedestrian opportunities that enhance the walking experience
- To develop an integrated open space system with linkages to the Regional Trail System.
- To complete a well rounded community with access to commercial necessities.



LOCATION PLAN

1.3 BACKGROUND

The 1964 City of Lethbridge General Plan recommended the development of lands in West Lethbridge, an initiative acted on in "The Urbanization of West Lethbridge" plan of 1969. In 1974 residential development commenced in Varsity Village, a neighbourhood immediately west of the University of Lethbridge site.

Today West Lethbridge is a major growth area with a population of more than 37,900.

The Canyons planning area land use concept further defines part of the Mountain Heights/RiverStone/River Bend ASP adopted in 1996 as a development framework for approximately 490 hectares of land. The ASP provides for a community core in southwest Lethbridge, which includes four unique neighbourhoods, two significant school sites and a commercial area. The Canyons represents the last stage of development within the ASP and constitutes a contiguous extension of the existing residential development in West Lethbridge as part of the South Village Area.

1.4 ADJACENT PLANNING AREAS

The Canyons is located west of the Paradise Canyon neighbourhood and southeast of the neighbourhoods of RiverStone and Mountain Heights/Sun Ridge. The adjacent neighbourhood of Paradise Canyon is fully developed and the upper Paradise Canyon will represent continuous urban development from the east. The RiverStone neighbourhood is nearing completion and will likely be completed within the next few years. RiverStone will be bounded by the Chinook Trail to the south which makes up the northern edge of The Canyons. Southwest from the plan area is agricultural land outside of any adopted ASP.

1.5 LAND OWNERSHIP

Undeveloped landownership within the Plan area is predominantly held between two parties, Melcor Developments Ltd, and Nick and Steve Denecky who have agricultural pursuits in the region. A further breakdown of this landownership can be found below in **Table 1**. Current land titles for all parcels are attached in **Appendix A**.

#	Legal Description	Landowner	Certificate of Title
A	BLK1, LOT 15 PLAN 111 3731	Melcor Developments LTD.	161 011 219 +38
В	NE 13-8-22-W4M	Melcor Developments LTD.	131 271 284 +37
С	N 1/2 OF NW 13-8-22-W4M	Melcor Developments LTD.	121 244 360 +1
D	BLK 1, LOT 1, PLAN 041 4514	Steve & Nick Denecky, Mary Westrup	091 032 214
Е	S ½ OF NW 13-8-22-W4M	Melcor Developments LTD.	151 048 077

Table 1 – Land Ownership within the Plan Area

#	Legal Description	Landowner	Certificate of Title
F	BLK 1, LOT 14, PLAN 021 0062	Melcor Developments LTD.	161 011 219 +37
G	SW 13-8-22-4	Steve & Nick Denecky, Mary Westrup	091 013 989

1.6 PLANNING CONTEXT

The Canyons Outline Plan has been prepared within the context of statutory plans and other policy documents of the City of Lethbridge. The following is a brief summary of relevant planning documents.

1.6.1 City of Lethbridge Municipal Development Plan, 2010

The City of Lethbridge Municipal Development Plan (MDP), Bylaw No. 5650 adopted on July 5, 2010, shows The Canyons Outline Plan area as an area for future residential development and states the objectives and policies that influence decisions concerning the form and function of land use within the outline plan area:

- Encourage urban design that promotes public safety and reduces opportunities for crime in parks, roadways and other public spaces
- Provide for the integration of a variety of housing opportunities
- Encourage and provide opportunities for healthy living
- Provide an efficient, effective and integrated multi-modal transportation network

1.6.2 South Saskatchewan Regional Plan

The south Saskatchewan Regional Plan (SSRP) is the primary tool for implementing the Provincial Land Use Framework Prepared by the Government of Alberta. The SSRP takes a holistic approach to the management of land and natural resources, establishing broad-based policies to guide responsible land management for 84,000 square kilometres of land within southern Alberta over the next 50-year period. The intension of the SSRP is to ensure that the many competing interests for limited land and natural resources is balances and that communities continue to work towards a common vision. The following key strategies are established within the SSPR which apply to this outline plan:

- Efficient Land Use
- Watershed Management
- Quality of Like
- Aboriginal Engagement
- Community Needs
- Energy
- Tourism

1.6.3 The Urbanization of West Lethbridge, 1969

In 1969, the Oldman River Regional Planning Commission produced "The Urbanization of West Lethbridge" plan. The plan recommended that West Lethbridge be developed as a series of villages.

1.6.4 Mountain Heights/River Stone/River Bend ASP, 2013

The Mountain Heights/RiverStone/River Bend ASP was adopted by Council in 1996 and subsequently updated in 1999 and amended in 2003 and 2013, as such the ASP conforms to the City of Lethbridge MDP and further describes:

- sequencing of development
- proposed land uses, including mostly low density residential with small medium density sites and perhaps higher density sites on the arterial roadways
- population density
- the general location of major transportation and public utilities, and
- any other planning matters that Council may consider necessary

The Canyons represents the central infilling of the Mountain Heights/River Stone/River Bend Area Structure Plan.

1.6.5 City of Lethbridge Land Use By-law, 2011

The City of Lethbridge Land Use By-law (LUB) No. 5700, originally adopted on July 25, 2011, defines land use districts for all lands within the City. The land within the proposed Outline Plan is currently zoned in accordance with the original Outline Plan ranging from low density residential to high density residential (R150), and also includes an urban innovation (UI) district on the site of the previously proposed mixed use site, and a public building district on the former school site. Future land use amendments will be required to reflect the land use designations in this plan.

1.7 PUBLIC CONSULTATION

The Canyons Outline Plan was originally available for viewing during an Open House at the Corporate Meeting Room of the Paradise Canyon Golf Course on Thursday April 24, 2008. The Open House was held between 4:00 and 7:00 p.m. and staff from the City of Lethbridge, Melcor Developments Ltd. and AECOM Canada Ltd. ("AECOM"; then known as UMA Engineering Ltd.) were available to answer questions.

The 2017 amendments as shown on **Figure 5**, were available for viewing during an open house held at the Immanuel Lutheran Church on October 11, 2017. Staff from the City of Lethbridge, Melcor Developments Ltd. and Associated Engineering were available to answer questions.

2 Site Conditions

The topography within the Plan area consists of gently rolling terrain with slopes ranging up to 4%, in the western section smoothing towards the east and the edge of the table lands adjacent to the Oldman River coulees. Elevations range from a high point of approximately 931 m above sea level, in the northwest portion of the plan area, to a low point of approximately 913 m in the north east. The difference in elevation between the high and low areas is approximately 18 m (see Figure 2).

The subsurface soils within the area are generally characterized as being comprised of organic topsoil, glaciolacustrine clays, glacial clay till, and bedrock. Further the coulee edge along the south border of The Canyons is much sharper than along the east edge adjacent to RiverStone where fingers of table land extend into the river valley.

2.1 EXISTING FEATURES

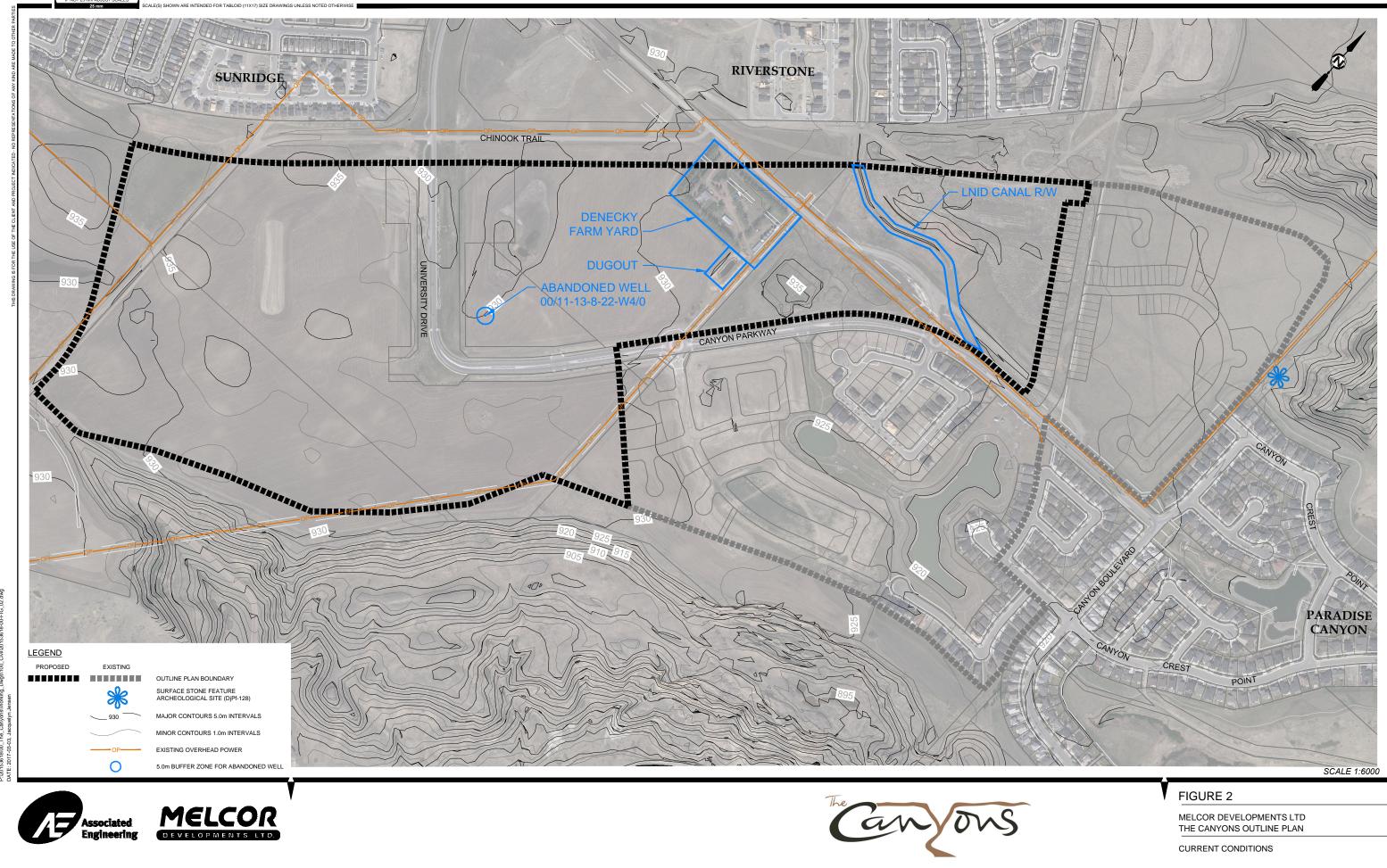
Within The Canyons Outline Plan area there is one currently utilized farmstead that will be subdivided for incorporation into the neighbourhood once the current residents choose to vacate. This farmstead is on a septic field that will be remediated and connected to the City of Lethbridge sanitary system upon adjacent development. The remainder of the lands are currently used for agricultural purposes. Additionally, an irrigation canal extends from the easterly portion of Mountain Heights and currently traverses the plan area. This canal will be conveyed from the upstream development boundary at Chinook Trail through the plan area maintaining the existing downstream connections. A portion of the irrigation water will be used to maintain the water level in the wet pond should it be necessary. Additional geotechnical investigations will be conducted at the time of the preparation of the detailed design drawings in the vicinity of the canal and dugout, as required.

The Plan area has no substantial treed areas, except for some shrubs around the decommissioned irrigation dugout and one larger cottonwood tree on the coulee edge in the eastern portion of the Plan area.

An abandoned well site, WEST-CAN ET AL LETHBRIDGE 11-13-8-22, has been identified within the Plan area (see **Figure 2 and Figure 5**). This well site will be developed as per the guidelines within the Phase One Environmental Site Assessment (Phase I ESA), completed by EBA Engineering Consultants Ltd. (see Section 2.2). When developing around the abandoned wellhead, which is likely cut and capped below the surface, there are setback requirements that are set out by the EUB. The Phase I ESA recommends that development should be a total of 15m away from the well center. Development adjacent to the well will be designed in accordance with Directive 079 – Surface Development in Proximity to Abandoned Wells, issued by the Albert Energy Regulator.

The Canyons contains portions of two existing road allowances. Rive Vie Parkway West Plan number 911 2075 will be utilized as both roadway and pathway as shown in the detailed design. Right-of-way plan 741 0377 will be developed as a roadway in the eastern portion of the Plan area and incorporated into the neighbourhood where its current linear design does not fit with the proposed transportation concept. Unnecessary sections of theses roadways will be closed and reclaimed to facilitate future development as expressed within this Plan.

During the creation of the Canyons Outline Plan, it was brought to the attention of the developer that a rattlesnake hibernacula existed in the coulees south of the plan area. Alberta Sustainable Resource Development (SRD) was consulted to guide a mitigation strategy for the hibernacula (discussed further in Section 4.6).



2.2 ENVIRONMENTAL SITE ASSESSMENT

The objective of the Phase One Environmental Site Assessment (Phase I ESA), completed by EBA Engineering Consultants Ltd. on behalf of the developer, was to comment on whether any past or present land use, either off site or on site, may have a potential to cause environmental impairment of the subject site.

The findings of the Phase I ESA can be found in the Findings and Conclusions section of the Executive Summary (page i within **Appendix B**).

All findings of the Phase I ESA have been accounted for in the development concept and implementation strategy within The Canyons Outline Plan.

2.3 GEOTECHNICAL EVALUATION

A Geotechnical Evaluation was completed by EBA Engineering Consultants Ltd. on behalf of the developer (Appendix C). The Evaluation contains findings and recommendations for the following areas:

- Subsurface Conditions
- Slope Stability Evaluation
- Recommended Development Guidelines
- Stormwater Pond Development
- Subdivision Development
- Design and Construction Guidelines

2.4 HISTORICAL RESOURCES IMPACT ASSESSMENT, 2007

A Historical Resources Impact Assessment (HRIA) was conducted by Arrow Archeology Ltd. in 2007 as part of the Outline Plan process, in order to "locate and assess historical resources within and adjacent to the proposed subdivision and provide recommendations for avoidance, mitigation and preservation of any such resources". The HRIA is included in **Appendix D** along with the approval letter from the Province.

A single archeological site was recorded on the easternmost portion of The Canyons planning area (see **Figure 2**). This site, DjPf-128, consists of four small cairns and a central surface stone feature of unknown function. As per recommendations within the HRIA report and from Alberta Tourism, Parks, Recreation and Culture, the site has been isolated from the surrounding development creating a landscape feature (see **Figure 3**).

Upon consultation with local First Nations leaders, a blessing of the archaeological site took place on July 22, 2008 (see Figure 4).

Figure 3 - Archaeological Site Incorporation

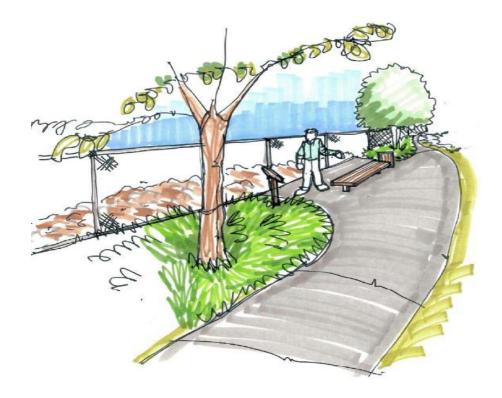


Figure 4 - Cairn Blessing, July 22, 2008



3 Innovative Development Elements

As a result of the existing site conditions and Melcor's ongoing commitment to building premier communities throughout Alberta, The Canyons will successfully implement several innovative design elements that will be unique within Lethbridge.

The development innovations include:

- The incorporation of Archeological Site, DjPf-128, into a cultural landscape feature connected to the trail network within the development (see Section 2.4)
- Creating smaller multifamily parcels so they are more accessible to local or smaller multifamily development companies (Section 4.3.2)
- Turning capacity constraints into design features in the development of a mature multi-housing medium density site in the northeast corner of the plan area limited to 76 units (see Section 4.3.2)
- Architectural controls that will provide a unified neighbourhood theme, ensuring a high quality residential subdivision (see Section 4.4)
- The construction of a fence that will prohibit rattlesnake access into the plan area, preserving the ecological integrity of natural habitat and preservation along the coulee edge (see Section 4.5)
- An integrated trail network with strategically placed signage that will highlight the cultural and natural features along the network promoting walkability throughout the development and ensuring a high level of connectivity for residents (see Section 4.6)
- Utilizing storm ponds as amenity features integrated into the trail network (see Section 4.6)
- Utilized roundabouts throughout the plan area in order to facilitate the flow of traffic in a safe and efficient manner, increasing safety for drivers, pedestrians and cyclists and reducing collisions and delays.

4 Land Use

4.1 DEVELOPMENT CONCEPT

The Canyons will satisfy the needs of a variety of lifestyles and family compositions as well as provide housing for younger and older market segments and families by offering a spectrum of housing types from conventional single and semi-detached housing, to townhouse dwellings, and patio homes fronting parks.

The Canyons will provide a community commercial area helping to provide residents with needed services, stronger neighborhood character and promote a pedestrian and bicycle friendly environment.

In sum, The Canyons will provide an integrated mix and diversity in residential and commercial form and character, providing an opportunity to integrate a range of housing options in a Master Planned suburban setting (see Figure 5).

4.2 LAND USE STATISTICS

As can be witnessed in **Table 2** and **Table 3**, preliminary land use statistics indicate that the Development will contain a total gross area of 140.22 hectares. A 10.25 hectare setback is required along the south boundary due to considerations regarding geotechnical stability. This setback area will likely be designated as Environmental Reserve and kept in a natural state to provide continued support for the wildlife inhabiting the coulee edge. In the very northeast corner, the setback amounts to 0.65 hectares resulting in a gross developable area of 129.32 hectares when both setbacks are accounted for.

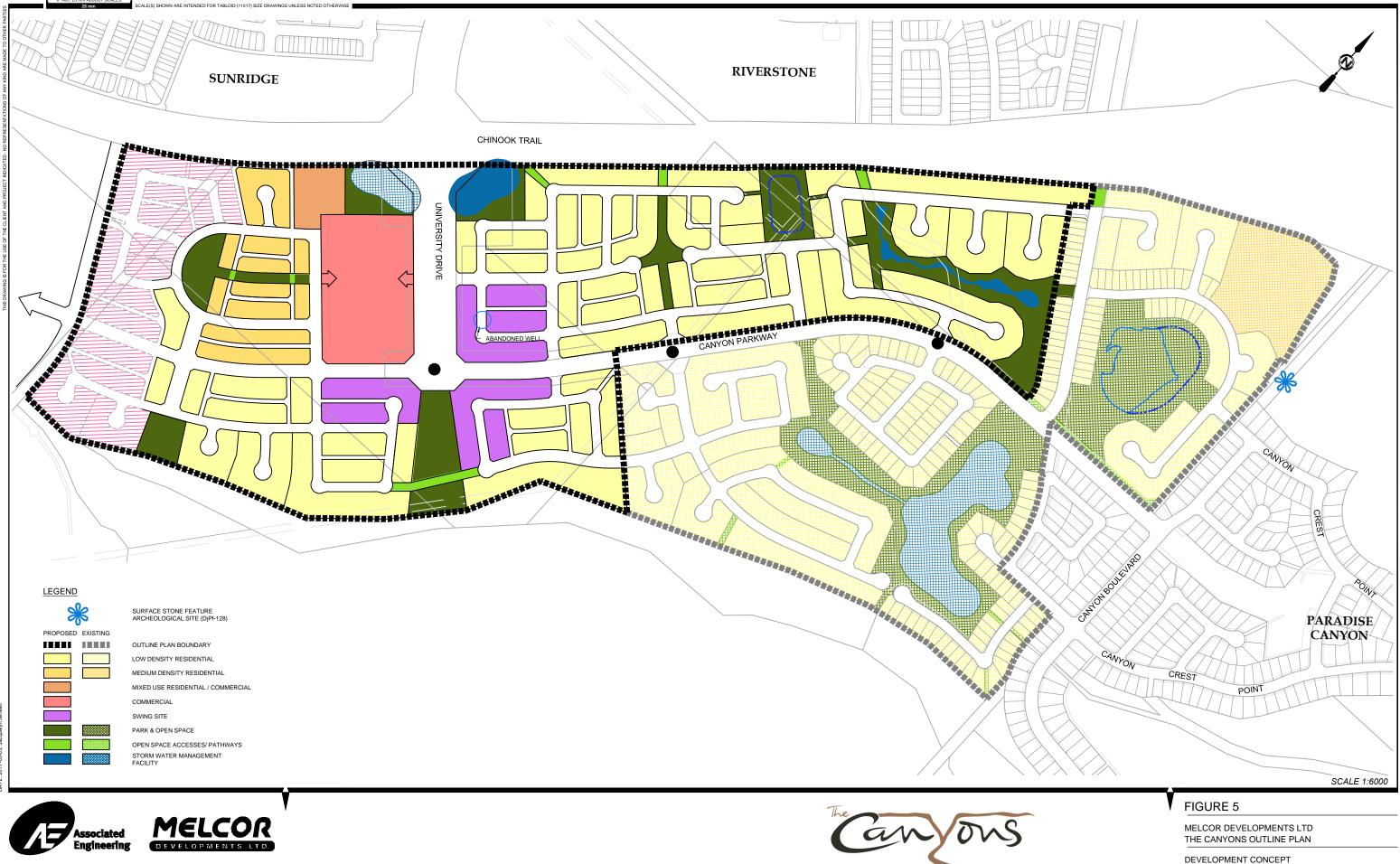


Table 2 – Land Use Statistics

Developable Land Analysis				
Use	Hectares	% of GDA		
Gross Area	140.22			
Environmental Reserve				
NE top of Bank	0.65	N/A		
South Top of bank	10.25	N/A		
Total Environmental Reserve	10.9			
Gross Developable Area	129.32	100		
Non-Residential Uses				
Circulation/Emergency Access	33.17	25.65		
Stormwater Management Facilities	7.57	5.8		
Commercial	4.22	3.26		
Parks, Recreation & Open Space Pathways	14.09	10.9		
Total Non-Residential Uses	59.05	45.66		
Residential Uses				
Northeast 76 Unit Multi Family	3.25	2.5		
Low Density 19 Upha	52.19	40.4		
Low Density 19 Upha - Shadow	6.34	4.9		
Mixed Use Residential/ Commercial Max 37 Upha	0.90	0.70		
Swing Site Max 37 Upha	4.17	3.2		
Medium Density 37 Upha	3.42	2.64		
Total Residential Uses	70.27	54.34		
Total Gross Developable Area	129.32	100		

Residence Type	Area (Ha)	Density (Upha)	Units	Persons/Unit	Population
Low Density	58.53	19	1112	3	3336
Swing Site	4.17	37	154	2.4	369
Mixed Use Residential/ Commercial Max	0.90	37	33	2.4	80
Medium Density	3.42	37	127	2.4	305
Medium Density (NE Site)	3.25	Site Specific	76	2.4	183
Total	70.27		1478		4273

Table 3 – Overall Population

4.3 RESIDENTIAL LAND USES

The development concept shows a series of identifiable residential enclaves, or nodes, defined by the roadway and open space system (see **Figure 5**). Residential land use will be developed to provide a range of low and medium density style housing uses. The anticipated dwelling options include single detached, semi-detached, town houses or apartments.

The format will facilitate a logical staging sequence and will provide opportunities for a range of housing to meet the needs of various target market groups. The range of residential options are intended to target "move-up" and "move-down" buyers, first time home owners, active adults and the elderly.

The development concept designates three categories of residential land uses and the districting plan contains four.

4.3.1 Low Density Residential

The low density residential component will include a compatible mix of lane and laneless dwellings. Lanes are being utilized to facilitate rear access, decrease on-street parking and limit direct driveway access to roadways.

Low density residential will be developed with single-detached housing units with an estimated average density of 19 upha. The vision for the low-density areas is to include a variety of lot sizes, to provide a range of housing options including starter home products. This increase in lot size decreases the estimated average density to 19 upha. The majority of the low density residential area will conform to the R-L, Low

Density Residential district. Secondary suites may be permitted provided they are located only in areas with lane access, preferably on corner parcels and not on cul-de-sac bulbs or round a-bouts where parking will not be an issue.

Low density residential compromises approximately 45.3% of the gross developable area and represents 75% of the anticipated dwelling units in the Canyons.

4.3.2 Medium Density Residential

Two components are envisioned for the Plan area: the first component will consist of medium density units of 37 upha in the west of the plan area and the second component will consist of 76 units on a 3.25 ha parcel on the northeast corner of the Plan area (see Figure 5).

The medium density residential component in the west of the Plan area is designated for multiple unit dwellings and may take the form of duplexes, townhouses, multiplexes and/or apartments, with a wide target demographic of singles, families, active adults and seniors. Proximity to amenity areas and access to collector and arterial roadways have influenced the location of the medium density sites.

The western medium density residential component compromises approximately 2.64% of the gross developable area and represents 8% of the anticipated dwelling units in the Canyons.

The medium density residential component in the northeast corner will be limited to 76 units. This is due in part to sanitary service constraints, however it also is a reflection of the vision of the developer to create a unique upscale node in the northeast corner. This node will be marketed to a mature clientele looking for multifamily/condominiumized living in spacious and pleasant surroundings. It is proposed that this site be designated as a Direct Control Land Use District to control the density of the site. It should also be noted than another benefit to capping the number of units will ensure traffic movements at the intersection with the future super-collector will not overwhelm the intersection and require upgrades from agreed to roadway widths and intersection treatments.

The north-eastern medium density residential component compromises approximately 2.5% of the gross developable area and represents 5% of the anticipated dwelling units in the Canyons.

4.3.3 Swing Site

Swing sites have been introduced into the plan area to accommodate changing community demographics and to respond to changing local market conditions. The intension of providing swing sited within the plan area is to provide the developer and the City with flexibility to consider wither low or medium density development in a location where the road network has sufficient capacity to accommodate intensity of development.

The western swing site residential component compromises approximately 3.2% of the gross developable area and represents 10% of the anticipated dwelling units in the Canyons.

4.3.4 Mixed Use Residential/ Commercial

Mixed Use Residential/ Commercial block has been introduced into the plan area to accommodate changing community demographics. The intention of providing a mixed use residential/ commercial block is to provide the developer and the City flexibly to consider the opportunity for introducing a right-in/ right-out access to Chinook Trail, when determining the final layout of the Commercial Site and Residential areas in the Block. Currently the layout shows there is no access to Chinook Trail directly to the west of the commercial site. When more information is known about Chinook Trail and the intersection of Chinook Trail at University Drive, right-in/ right-out access from the road west of the commercial site to Chinook Trail will be re-evaluated by Melcor and the City to determine if a right-in/ right-out is possible at this location.

The Mixed Use Residential/ Commercial component compromises approximately 0.7% of the gross developable area and represents 2% of the anticipated dwelling units in the Canyons.

4.3.5 Commercial Site

The commercial site development is located west of the extension of University Drive. The commercial development is envisioned to be of a neighbourhood scale and nature. The location will provide access from the surrounding neighbourhoods. The final design and layout of the development within the site will be at the discretion of the site developer, who will be subject to the requirements laid out in the City of Lethbridge Land Use Bylaws, and other relevant published design standards.

The lands designated for commercial development in the Outline Plan will be redistricted from the current zoning, to an appropriate commercial or Direct Control Land Use District.

4.4 ARCHITECTURAL CONTROLS

The Canyons will utilize architectural controls in order to provide a unified neighbourhood theme, ensuring a high quality residential subdivision. As such, the developer will establish and enforce architectural controls on residential development that will be registered on title subsequent to subdivision and registration of titled lots.

Tentative Architectural Controls include:

- Housing units with similar elevations will be interspersed and not located adjacent to one another
- The height, form and color of each house will be compatible with houses on adjacent lots
- Differentiation will also be achieved by encouraging a variety of exterior finishes and shingle alternatives
- A pleasing streetscape will be promoted through various controls to prevent broad expanses of blank facades by encouraging the use of windows and architectural modeling rather than a flat façade
- High visibility lots, including corner lots, will have higher architectural controls to ensure that flankage of these houses is acceptable.

Furthermore, incorporation of appropriate architectural detailing will be encouraged to ensure medium density developments are complementary to and compatible with surrounding residential development, and particular attention will be paid to address transitions between building types.

4.5 SOUTH SETBACK OPEN SPACE

Based on consultation with Alberta Sustainable Resources Development (SRD) and stakeholder involvement, the following actions will be taken as mitigation measures regarding the rattlesnake hibernacula:

- 1. Eco-interpretive lookouts will be developed between The Canyons subdivision and the adjacent coulee edge. However, access will be provided for emergency purposes only at three locations along the southern coulee area and at the AltaLink transmission line in the northeast coulee area (see Figure 5).
- 2. The setback boundary is defined by the setback area prescribed by the geotechnical review completed by EBA Engineering.
- 3. A fence will be constructed (by the Developer) on the property lines and maintained (by the property owner via caveat) to a condition that will not allow access of the rattlesnakes into the development area while remaining pervious to water.
- 4. An ancillary function of this fence will be to prohibit human access into the buffer zone (between the geotechnical setback and the coulee edge).
- 5. The buffer zone will be left in as natural a state as possible with the reestablishment of native grasslands along its extent, encouraged at the expense of the Developer.
- 6. A wildlife signage program will be implemented throughout the neighbourhood in order to inform residents about the different wildlife in the area. (SRD will provide educational material).

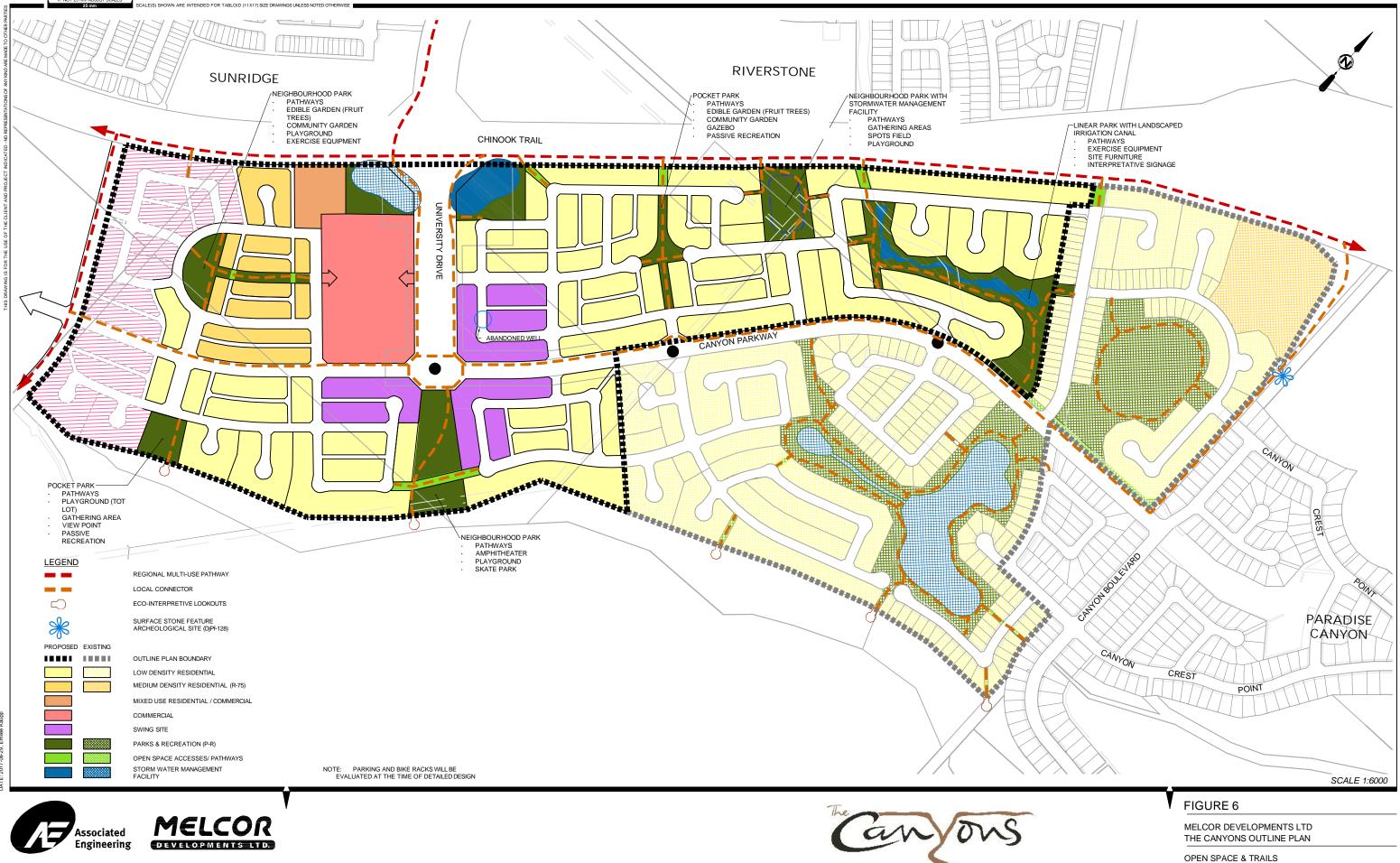
4.6 PARKS, LINEAR PARKS, AND MR CREDITABLE SWMF OPEN SPACE

The parks and open space system is a fundamental design element in The Canyons. Open space within the plan area has been designed in consultation with the Parks Department to create useable spaces with interesting views, diverse pedestrian experiences and park amenities. The design provides links to adjacent neighbourhoods and regional trails through a combination of municipal reserve, public utility lots, on-street sidewalks and dedicated walkway links (see **Figure 6**). These open spaces comply with the City of Lethbridge Parks Master Plan requirements in consideration of higher density nodes within The Canyons and serve to ensure the abundance of open space throughout the community.

As can be seen in **Figure 6**, the trail network within The Canyons will promote walkability throughout the development, ensuring a high level of connectivity for residents. Additionally, signage will be placed strategically in order to highlight the cultural and natural features along the network.

The open space for the linear parks and municipal reserve credible Storm Water Management Facility (SWMF) open space areas will be measured from the back of the lot to the 1 in 100 year flood event for the SWMF, with the exception of rain garden/drainage swales where the Parks Department has indicated that this would be Municipal Reserve credible if designed to an acceptable level.

Sound design of these elements has been encouraged through the incorporation of Parks Department goals concerning spatial integrity, naturalizing storm ponds to encourage ecological enhancements and quality landscape features in pathways, rain gardens and adjacent areas.



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OPEN SPACE & TRAILS

5 Transportation and Circulation Requirements

The information presented in this section is drawn from the Traffic Impact Study (TIS) document (Appendix E) completed by AECOM and the TIS update is located in Appendix H. This TIS is an update to the original TIS completed by AECOM.

This TIS was completed in conformance with the City's current TIS guidelines and associated TIS signoff procedure.

In general terms, AE performed the work as described below in preparation of the TIS update:

5.1 BACKGROUND TRAFFIC

The traffic count data for Paradise Canyon & Canyon Crest as well as the trips associated with the Paradise Canyon Golf Course that were obtained for the original TIS were used as background traffic for the purposes of the study. However the land use used to calculate the background traffic has increased since the 2009 TIS for an overall increase in background traffic from the 2009 TIS.

5.2 TRIP GENERATION RATES

In order to develop Trip Generation for the revised Land-Use Plan, the development area was divided into traffic zones, similar to the zones used in the 2009 TIS. Within these zones, the number of units or size of each land use type was determined. Trip generation rates from the 2009 TIS were then applied to each land use type within each zone. The trip generation rates used from the 2009 TIS were based on the following:

- Residential Low Density (RL/R-SL) City of Lethbridge Standards
- Medium Density (R-37) City of Lethbridge Standards
- Medium Density (R-75) City of Lethbridge Standards
- Commercial Fitted curve equation for mixed use commercial shopping centre as per the ITE Trip Generation Manual (Land Use: 820)

The revised Land Use Plan, shows the open space areas and trail network on **Figure 6**. The road hierarchy has been presented on **Figure 7**.

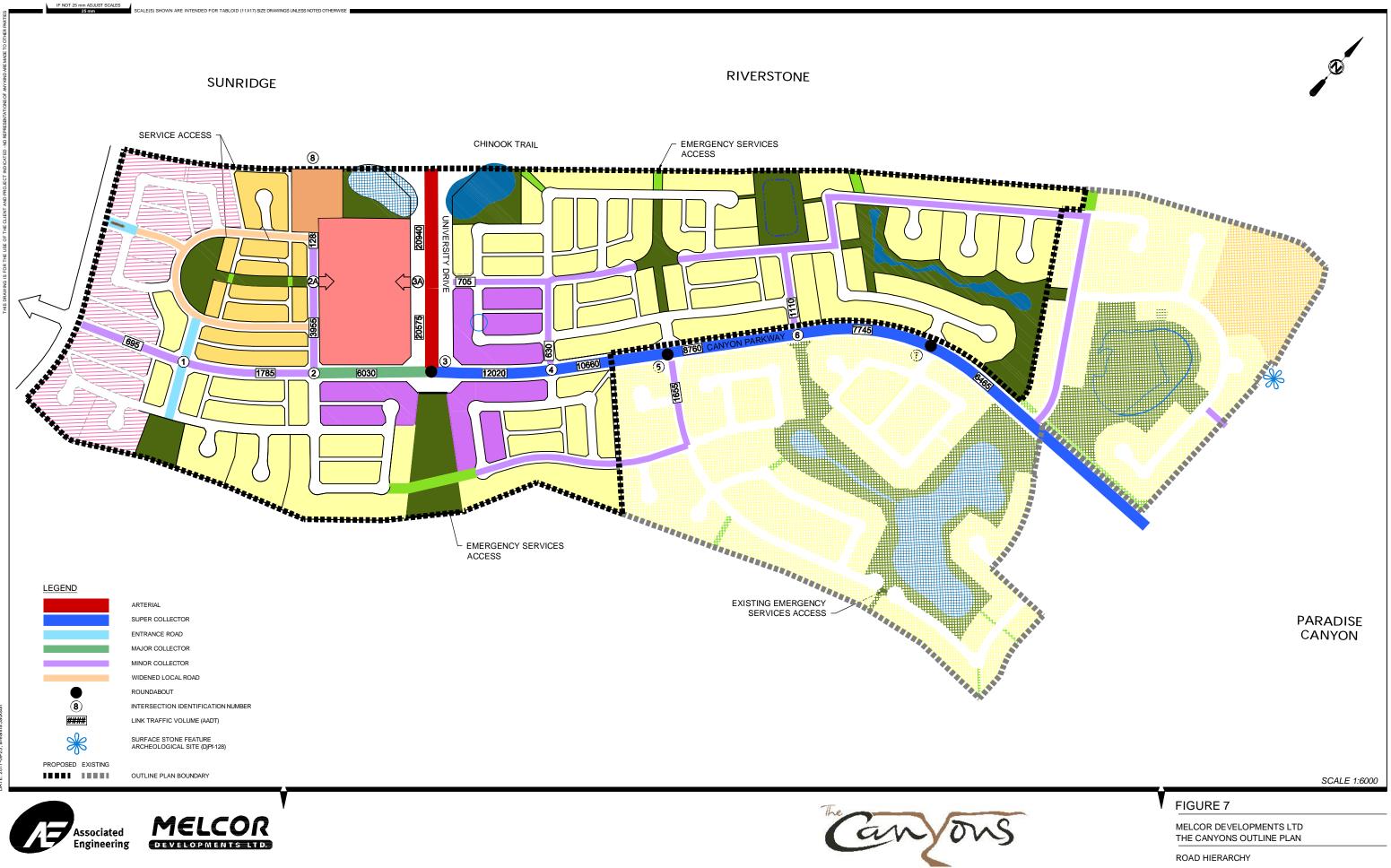
5.3 FORECAST TRAFFIC VOLUMES

As a result of the changes in land use and the trip generation rates calculated for each traffic zone, the overall daily traffic volumes are comparable to the original 2009 TIS. As such, all the forecast traffic volumes on the roadway links are within the City of Lethbridge Standards for each respective roadway classification as noted on **Figure 7**.

5.4 INTERSECTION ANALYSIS

AE evaluated all the revised intersections or intersections impacted by the changed land uses within the Outline Plan Area using full build out traffic volumes. All intersections operate at acceptable levels of service based on the intersection types defined in the Outline Plan and TIS. The Outline Plan Update includes the following proposed changes to the intersection treatments:

• Intersections along Canyon Parkway, west of University Drive:



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- Originally, there were three intersections along this portion of roadway one roundabout and two standard, two-way stop controlled intersections.
- With the changes to the land use, there are now two intersections, proposed as standard, two-way stop controlled intersections.
 - Intersection 1 is located 200m from the west development boundary.
 - Intersection 2 is located 231m from Intersection 1 and 208m from Intersection 3, at University Drive
- Intersection/Accesses for Commercial Site
 - Originally, the two accesses provided to the commercial site included one right-in/ right-out access from University Drive and one all-turns access from the roundabout, west of University Drive.
 - Intersection 2A (new) A T-intersection access has been added on the west side of the commercial site at 162m north of Canyon Parkway. This intersection is proposed with stop control for vehicles exiting the commercial site.
 - Intersection 3A (replaces intersection 2 from original TIS) this is a RI/RO intersection that will have yield control for all movements. An additional RI/RO access on the east side of the intersection has been added for vehicles accessing parcels to the east of University Drive. This intersection is located 157m north of Canyon Parkway.
- Intersection 3 University Drive and Canyon Parkway roundabout
 - Based on discussions with the City of Lethbridge, this roundabout will remain as originally proposed with three legs. U-turning southbound to northbound will be encouraged to accommodate Intersection 3a's RI/RO layout
- Intersections along Canyon Parkway, east of University Drive
 - Intersection 4 a fourth leg was added to this intersection, providing access to the medium density area to the south. This intersection will operate as a two-way stop controlled intersection. This intersection is located 213m east of Intersection 3 at University Drive.
 - Intersection 5 a fourth leg was added to the north side of the roundabout providing access to the low density residential land use area to the north. This intersection is located 208m east of Intersection 4.
 - Intersection 6 the T-intersection will remain as originally proposed, with no changes. This intersection is located 230m east of Intersection 5.
 - Intersection 7 a fourth leg was added to the north side of the roundabout, providing access to the low density residential land use area to the north. This intersection is located 243m east of Intersection 6.
 - Intersection 8 Intersection 8 is shown in figures, but not analysed as an intersection at this time. When more information is known about Chinook Trail and the intersection of Chinook Trail at University Drive, the right-in/ right-out access from the road west of the commercial site to Chinook Trail will be reviewed by Melcor and the City to determine if the location is acceptable.

Intersection treatment types and spacing is shown on Figure 8.

5.5 TRANSIT ROUTES

Transit Routes will preferably be placed on collector roads within the Canyons development. Routes may be placed on local roads temporarily or permanently to meet transit needs at the discretion of the Transit Manager. Roadways will be designed to meet current City of Lethbridge Design Standards to ensure adequate serviceability for transit vehicles.

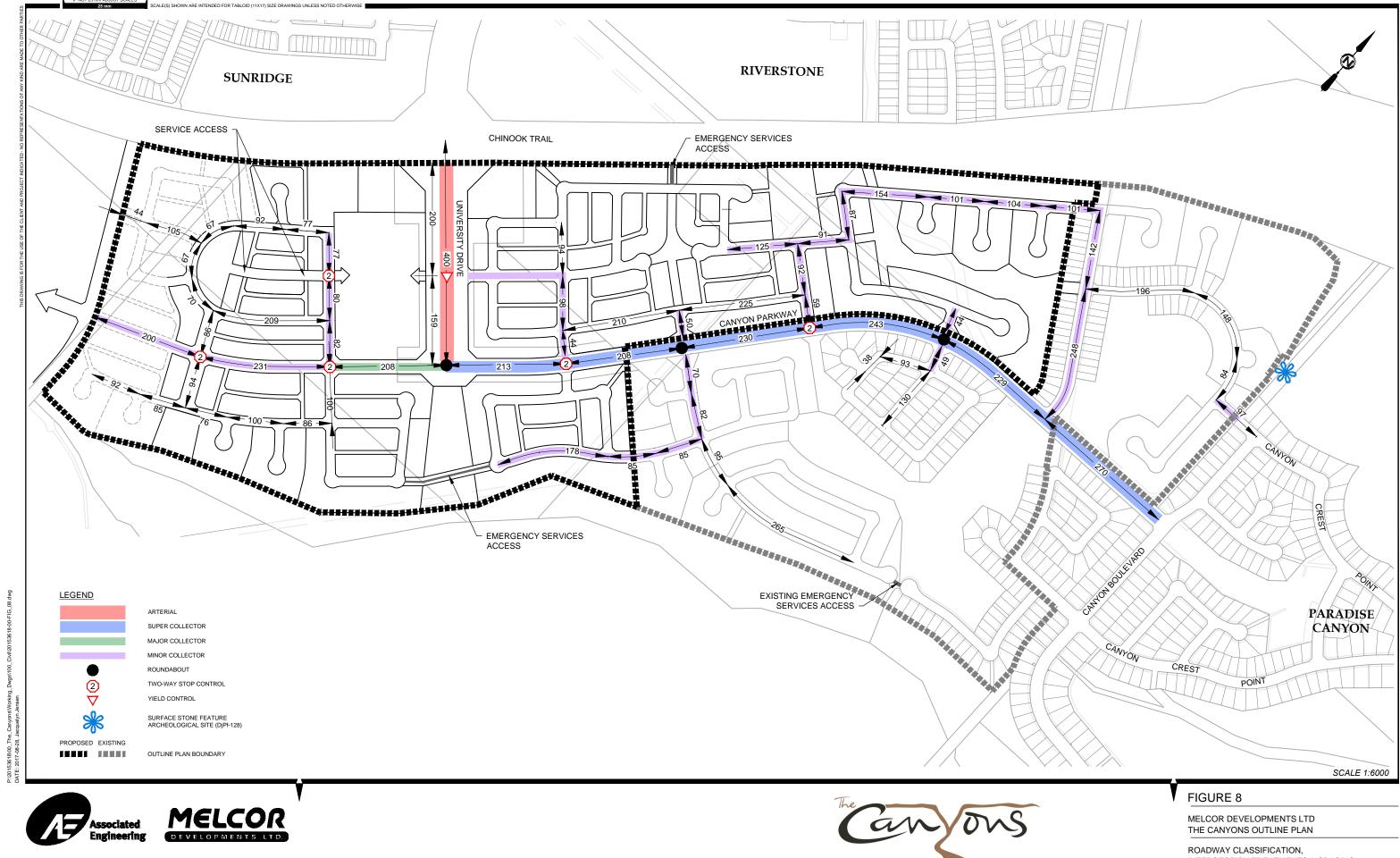
Transit standards may change between the Outline Plan approval and the implementation of a transit route in a new neighbourhood. Transit service standards will correspond to the Transit Master Plan.

5.6 SUPER-COLLECTOR LANDSCAPING

In order to ensure that the super-collector will be pedestrian friendly, the roadway will be landscaped in a manner that is attractive and promotes walkability.

5.7 SOUND ATTENUATION STUDY

A noise assessment is to be conducted at the time of the development process for the development(s) abutting the super-collector. The sound attenuation will be dependent upon the land use and development layout proposed.



INTERSECTION TREATMENTS & SPACING

6 Water Distribution

There are two water mains that are currently providing water service to the Development. Main 1, located toward the east boundary of the site, is 300 mm in diameter. Main 2, located near the intersection of University Drive and SunRidge Blvd, is also 300 mm in diameter and has been extended south along University Drive and along Canyons Blvd. West servicing the outline plan area and the existing Paradise Canyon development.

There is an existing 250 mm diameter pipe that extends into the north east side of the development from the existing Paradise Canyon water system. In addition, there is a 200 mm diameter pipe that extends from the existing Paradise Canyon system into the southeast corner of the development. These lines will provide internal loops to the existing Paradise Canyon neighbourhood. These lines and the proposed water servicing strategy are shown in Figure 9.

The water distribution system completed to date has completed a looped system that allows for multiple points of service, mitigating the impacts of system failures. Further The remainder of the water servicing for the Outline Plan area will be constructed in accordance with City of Lethbridge design standards.

Water system looping will be provided to each phase so that a single connection to the water system will serve no more than 30 lots.

The water system will be looped to ensure that the maximum number of lots serviced without a completed loop will be limited to 35. Individual phases will be staged so that the maximum number of lots serviced on an interim basis without looping will be limited to 70.

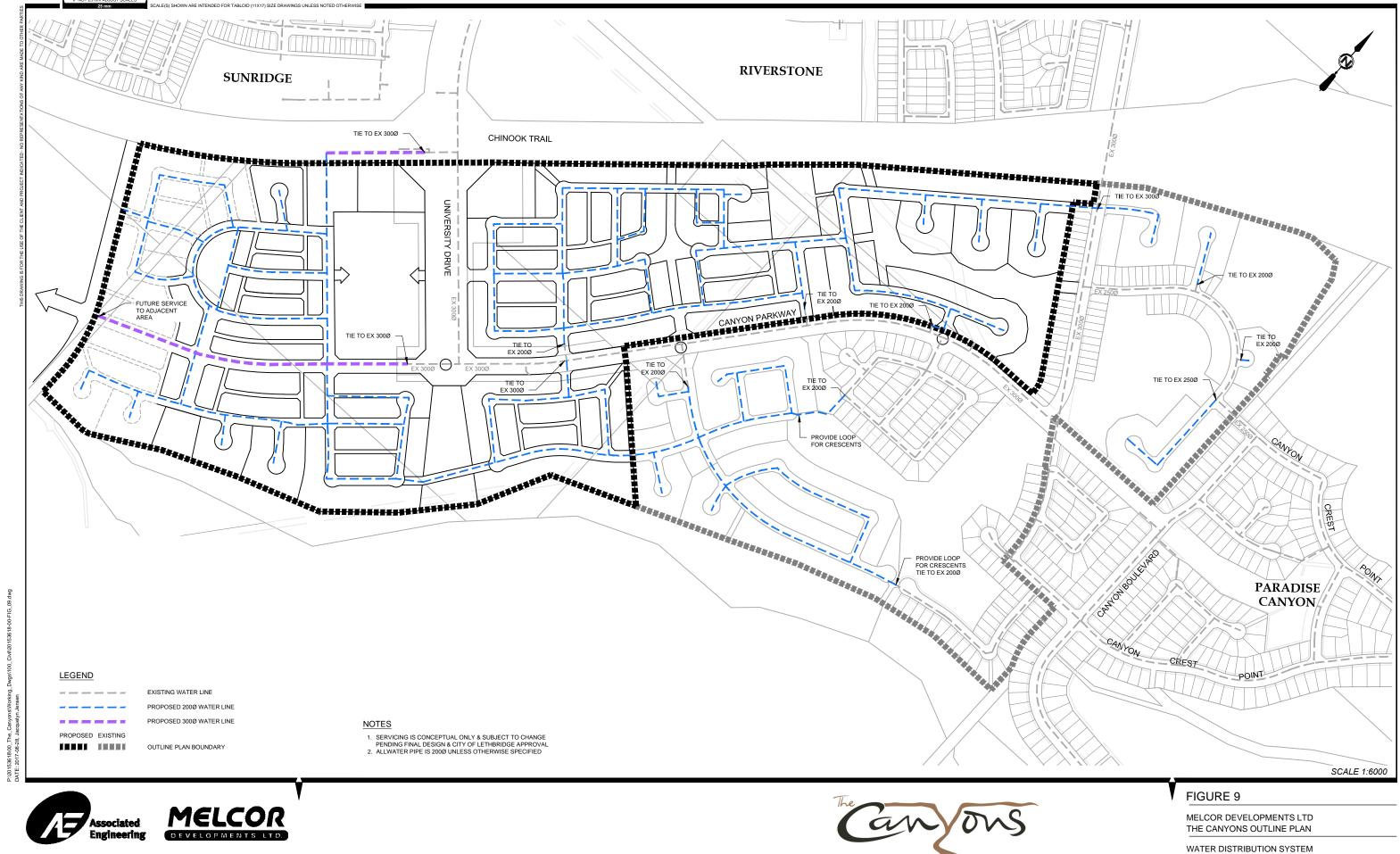
6.1 FIRE PROTECTION

The provision of adequate fire protection is important to the safety and security of all City neighbourhoods and residents. The Canyons has been designed to meet all of the required standards and guidelines for development of this nature. Roads have been designed, and are of sufficient width, to allow for safe and convenient access for all emergency vehicles and all fire flow requirements will be developed to the City standards.

7 Sanitary Collection

The existing sanitary collection system near the Canyons Development area consists of two main sanitary trunk lines (Trunks A and B) conveying flow by gravity to the north and two minor connections (Trunks C and D) that convey flow to the existing upper bench lift station in Paradise Canyon. These sanitary lines are available to provide service to the Canyons development and are further described as follows:

Trunk A (nodes A3, A4, A5 and A6) is a 450 mm diameter sanitary line running through the eastern
portion of the site and flows north into the RiverStone subdivision. Currently discharging to Trunk A
at node A3 are two existing force main system that serves Paradise Canyon. The force mains and
the respective pumping stations (the Upper Bench Lift Station (UBLS) and the Downhill Lift Station)
are shown on Figure 2.1 – Sanitary System Overview. Each lift station is fed by an independent
gravity sewer system. Paradise Canyon Phase 7A also contributes to Trunk A at and upstream of
node A4.



- Trunk B (node B16) is a 675 mm diameter sewer line located near the intersection of University Drive and SunRidge Blvd and flows north along University Drive. Trunk B will need to be extended south along University Drive to service the Canyons development.
- Trunk C (node A1) is a 200 mm diameter sanitary line located in the northeast corner of the development and flows east into Paradise Canyon phase 6 and toward the UBLS.
- Trunk D (node A2) isa 200 mm diameter sanitary line located in the southeast corner of the development and flows east from Paradise Canyon phase 7A toward the UBLS.

The land use statistics contained in Section 4 have been used to estimate a population for The Canyons development. This information has been used along with the generation rates provided in the City of Lethbridge Design Standards (2016) to determine the peak sanitary flows generated by the development including dry and wet weather flows and infiltration.

Sanitary catchment areas and main trunk lines for The Canyons development are shown on the attached **Figure 10**. The system will be sized to satisfy the City of Lethbridge level of servicing objectives. The majority of sanitary sewers within the Canyons development will be 200 mm diameter pipe. The remaining sewers will range in size from 250 mm up to 375 mm.

7.1 ZONE A

The Canyons development area Zone A is the contributing area which will be conveyed either by gravity or by the Upper Bench Lift Station and force main to Trunk A. Zone A includes approximately 29.86 ha, including low and medium density residential.

Approximately 9.05 ha of Zone A is conveyed to the UBLS by Trunk C (5.46 ha) and Trunk D (3.59 ha). Together with the existing contributing area the Upper Bench Lift Station will convey approximately 27.2 L/s to Trunk A (node A3). Similarly, the downhill lift station will convey approximately 25.7 L/s to Trunk A (node A3).

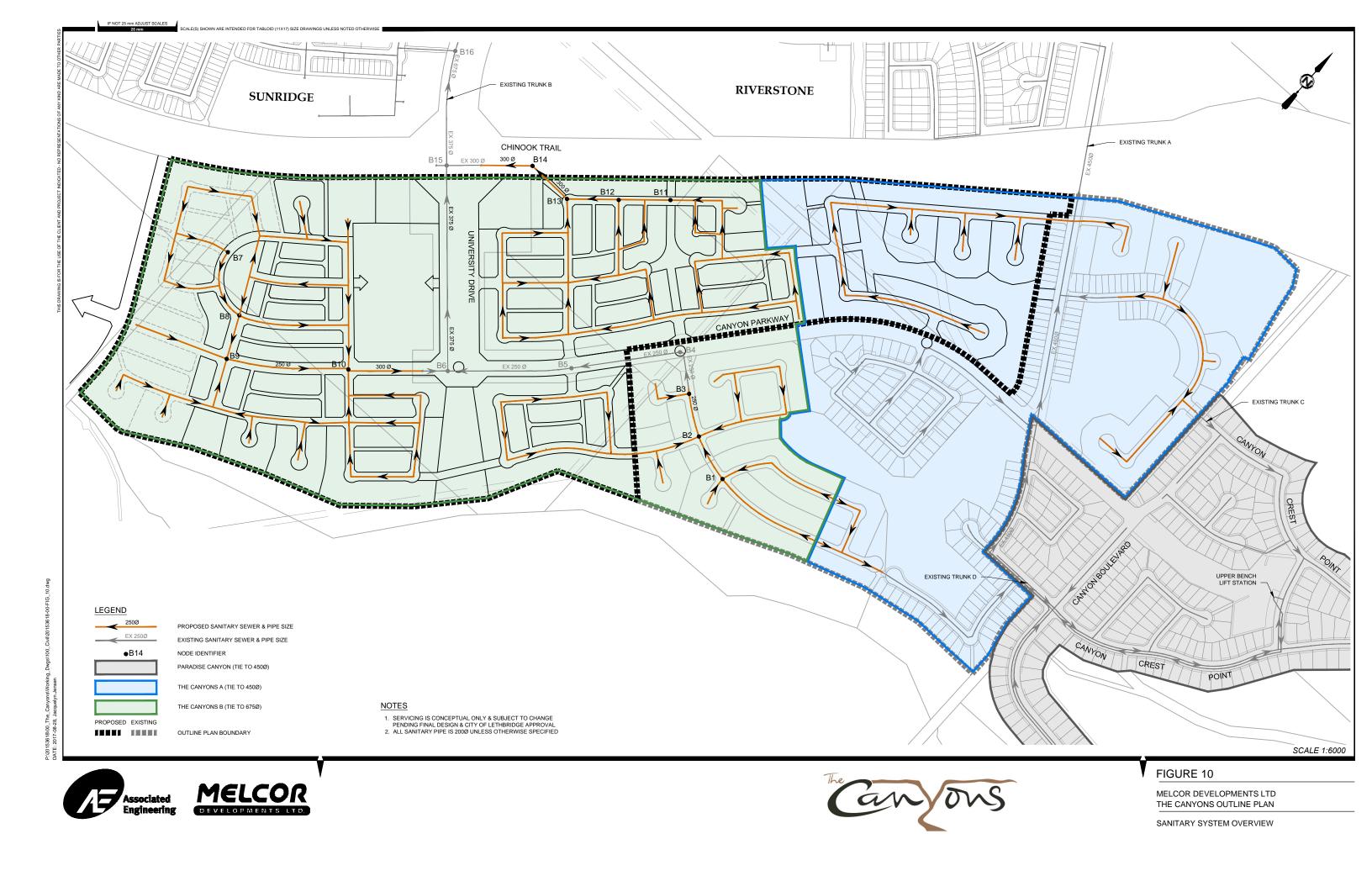
The remaining 20.81 ha of Zone A is connected directly by gravity to Trunk A (node A4, A5 and A6) without going through the adjacent development.

The total calculated flow to Trunk A is 85.3 l/s, increasing from the previous outline plan flow rate of 72.6 l/s.

7.2 **ZONE B**

The Canyons development area Zone B is the contributing area which will be conveyed by gravity to Trunk B (node B16) as shown on **Figure 10**. Zone B includes approximately 53.13 ha including low and medium density residential.

The total calculated flow to Trunk B from the Canyons Outline Plan Area is 79.4 l/s, a net decrease in the peak flow from the previous outline plan flow rate of 100.1 l/s.



8 Stormwater Management

The following information contained within this section is based upon the findings contained within the Storm Water Pond Report (**Appendix F**) and the Overland Drainage Analysis (**Appendix G**) independently completed by AECOM. No additional modeling was completed in support of this outline plan amendment. The locations and sizes of the stormwater management ponds have not changed from the original submission. Based on an analysis of the proposed land use changes across the entire site, there has been a minor reduction in the overall impervious area (66% from 67%). During the design of the proposed layout and conceptual grading, care was taken to ensure that the overall catchment areas for each pond facility were not changed.

AECOM has conducted a preliminary review of the storm water servicing in, and adjacent to, The Canyons development area. The following information was used to conduct the review:

- Mountain Height/RiverStone/River Bend Area Structure Plan
- RiverStone Stormwater Trunk & Outfall Capacity Analysis (Stantec 2004)
- Paradise Canyon Upper Bench Stormwater Report (UMA, March 10, 2000)
- Canyon Communities, Revised Outline Plan Master Servicing Plan
- Canyon Communities, 40th Avenue West Record Drawings
- Canyon Communities, Phase 2 Record Drawings
- Canyon Communities, Phase 6 Approval Drawings
- Paradise Canyon, Canyon Boulevard West Record Drawings
- Paradise Canyon, Upper Bench New Phase 1 Record Drawings
- Paradise Canyon, LNID Pipeline Relocation Record Drawings
- GPEC Consulting Record Drawings

In addition to the review of the above noted documents, the Alberta Environment (AENV) Stormwater Management Guidelines (1999) and City of Lethbridge Design Standards (2009) were used to develop the proposed stormwater system within the Canyons development. New phases of development will follow the most recent version of the City of Lethbridge Design Standards. AENV requires that 85% of the Total Suspended Solids (TSS), greater than 75 μ m (0.075 mm) in diameter be removed. The guidelines also provide Best Management Practices (BMP) that can be used to control the quantity and quality of runoff discharged from the site.

The Canyons stormwater management concept proposes to use a combination of wet and dry ponds as the primary BMP method to control water quantity and quality. Wet ponds will be utilized in catchment areas that connect to pipe systems that may not have a downstream treatment (BMP) facility. Dry ponds will be utilized to control quantity in catchments that do connect to a downstream treatment (BMP) facility. Melcor Development's has indicated that irrigation water rights are available and can be utilized to provide make up water as required to the wet ponds.

To facilitate the proposed stormwater concept, three wet ponds and two dry ponds located within the Canyons development will provide the required stormwater treatment and storage. Stormwater generated within the Canyons will ultimately discharge to the Oldman River. The existing trunk lines convey stormwater through a series of existing outfalls, therefore a new outfall is not required to initiate the development. *However, a future stormwater facility and outfall will be required when the western*

area of the Canyons develops. It is anticipated the new facility and outfall will be part of the planning required for the lands west of the Canyons. Should the Developer wish to proceed within Zone 4 prior to servicing being available to the west, the developer may need to provide an alternate Zone 4 stormwater strategy.

The northern boundary of the Canyons development is bordered by a road right of way (ROW) for the proposed Chinook Trail. The development of Chinook Trail will prevent all runoff north of the Canyons from entering the Canyons development. With the exception of Zone 8 (described below) lots adjacent to Chinook Trail will be provided with a system to direct storm flows away from Chinook Trail.

The western boundary of the Canyons development is bounded by a future road ROW that will restrict runoff from entering the Canyons development. The southern boundary of the Canyons development is bounded by Environmental Reserve lands that slope toward the coulees.

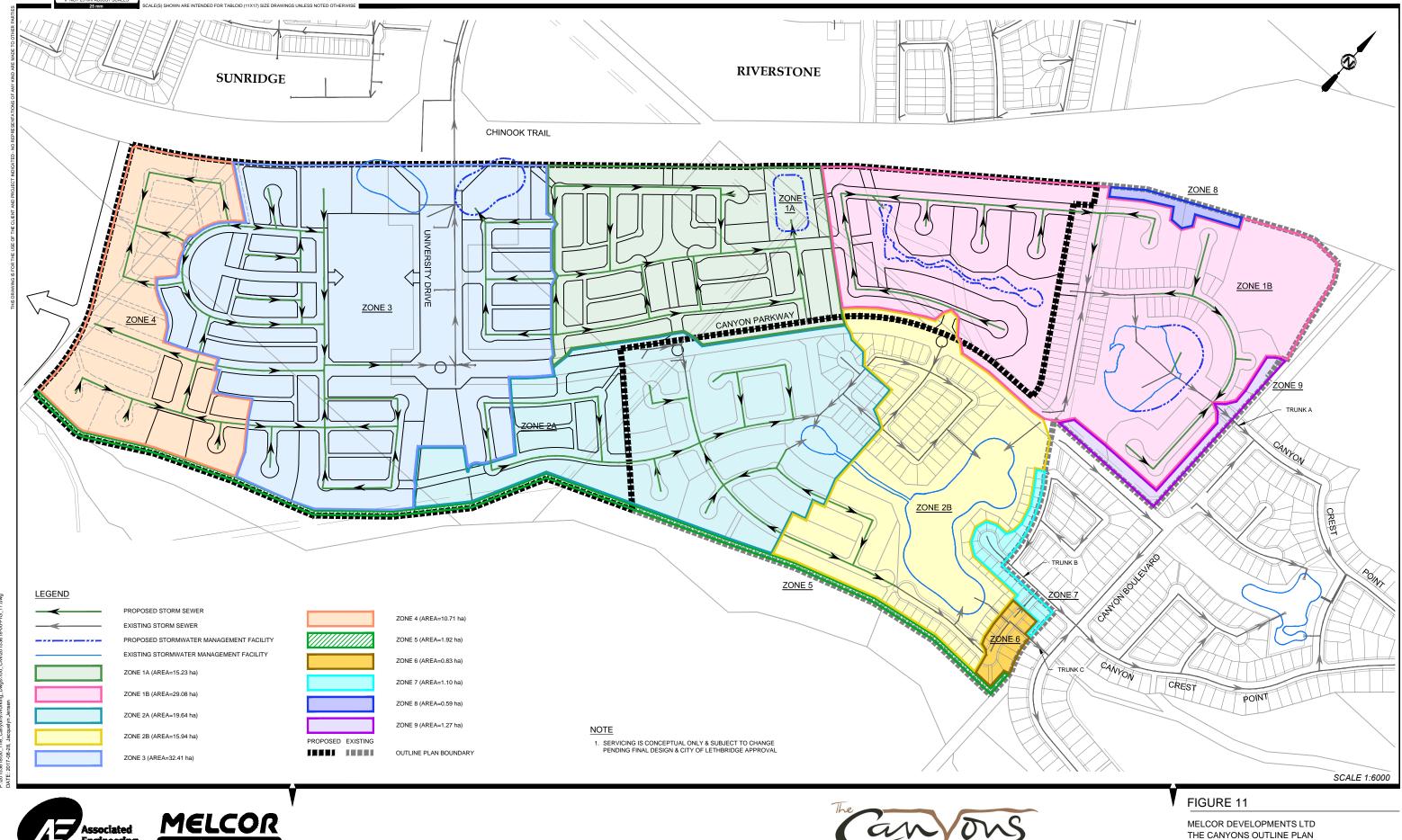
The eastern boundary is adjacent to existing development that has been designed with future development within the Canyons in mind. The stormwater collection system near the Canyons Outline Plan area consists of four existing main stormwater trunk lines (Trunks A, B, C, D) and one future stormwater trunk line (Trunk E - Zone 4). Through our review and discussions with the City of Lethbridge, it was confirmed that the existing stormwater trunk lines have incremental spare capacity and are available to provide servicing to the Canyons development. A brief description of each of the existing trunk lines (and its capacity) and the future trunk line is provided below:

- Trunk A has an available capacity of 655 l/s available to service the northeast portion of the Canyons development.
- Trunk B has an available capacity of 285 L/s to service the eastern portion of the Canyons development.
- Trunk C has an available capacity of 290 L/s to service the southeast portion of the Canyons development.
- Trunk D has an available capacity of 500 L/s to service the central portion of the Canyons development.
- Trunk E (Future Zone 4) will be required to service the west area of the Canyons development. It is anticipated that Trunk E will connect to a future stormwater facility in the west neighbouring area.

The proposed stormwater management system for the Canyons development will be developed utilizing a minor/major system philosophy. The systems are shown on **Figure 11** and **Figure 12**. Catchment areas presented in the original outline plan have been revised to reflect the proposed layout. Catchment areas have not changed significantly from the original outline plan.

The minor system will consist of a piped stormwater network designed to accommodate the 1 in 5 year rainfall event.

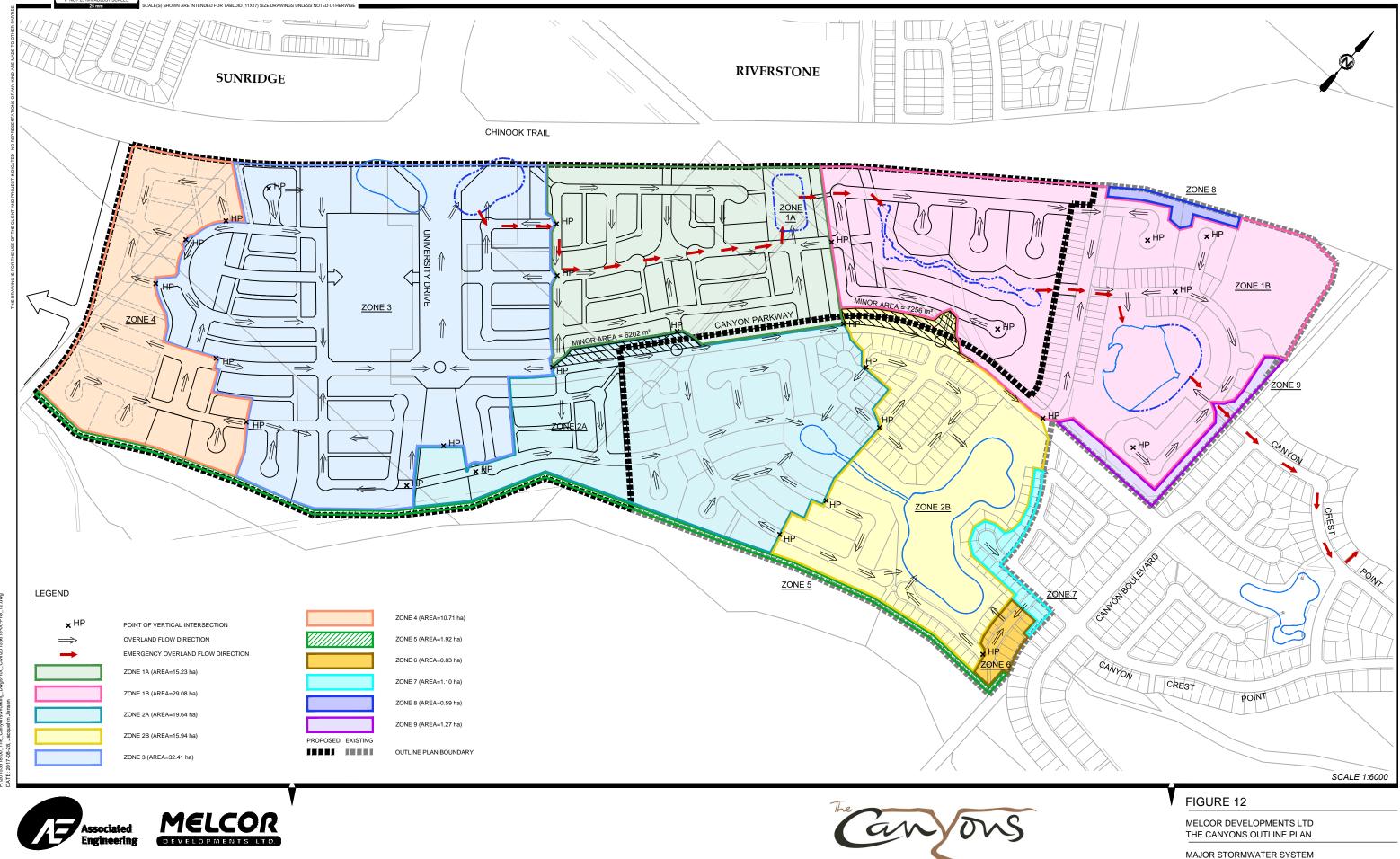
The major system will comprise a network of swales, roadways and overland flow routes designed to accommodate the 1 in 100 year rainfall event.







MINOR STORMWATER SYSTEM



MAJOR STORMWATER SYSTEM

Items to note on the Figures include:

- All properties zoned for non-residential land uses and for residential other than single family must retain runoff volumes in excess of the 1 in 5 year return period and up to a 1 in 100 year return period on site. On-site stormwater management concepts will be developed and submitted to the City for review at the time of development.
- The back of lots along the southern boundary (Zone 5) will sheet flow onto the reserve lands. The distance from the back of lots to the coulee edge varies from 40 metres to 125 metres therefore a majority of the runoff will infiltrate into the soils and it is unlikely that runoff will actually reach the coulee. It is important to note that while fencing along Zone 5 will be pervious to water it will also serve the purpose of restricting the movement of rattlesnakes into the development area. Various options exist for porous snake barriers. Details on the type of fencing to be adopted in Zone 5 will be provided at the Detailed Drawing stage.
- Zone 8 identifies an area of rear lot drainage which will be directed to the Chinook Trail ROW through sheet flow. Differential grades in this area prohibit the collection of stormwater and discharge into the Zone 1B system.
- Zone 9 identifies an area of rear lots which will discharge into the adjacent properties. The lots along the eastern portion border the 12 m wide Alta Link ROW which will be contoured to convey drainage toward the existing roadway. The southern portion is bounded by an 40th Avenue that will intercept and convey the runoff to existing infrastructure.

9 Staging and Implementation

9.1 TENTATIVE STAGING

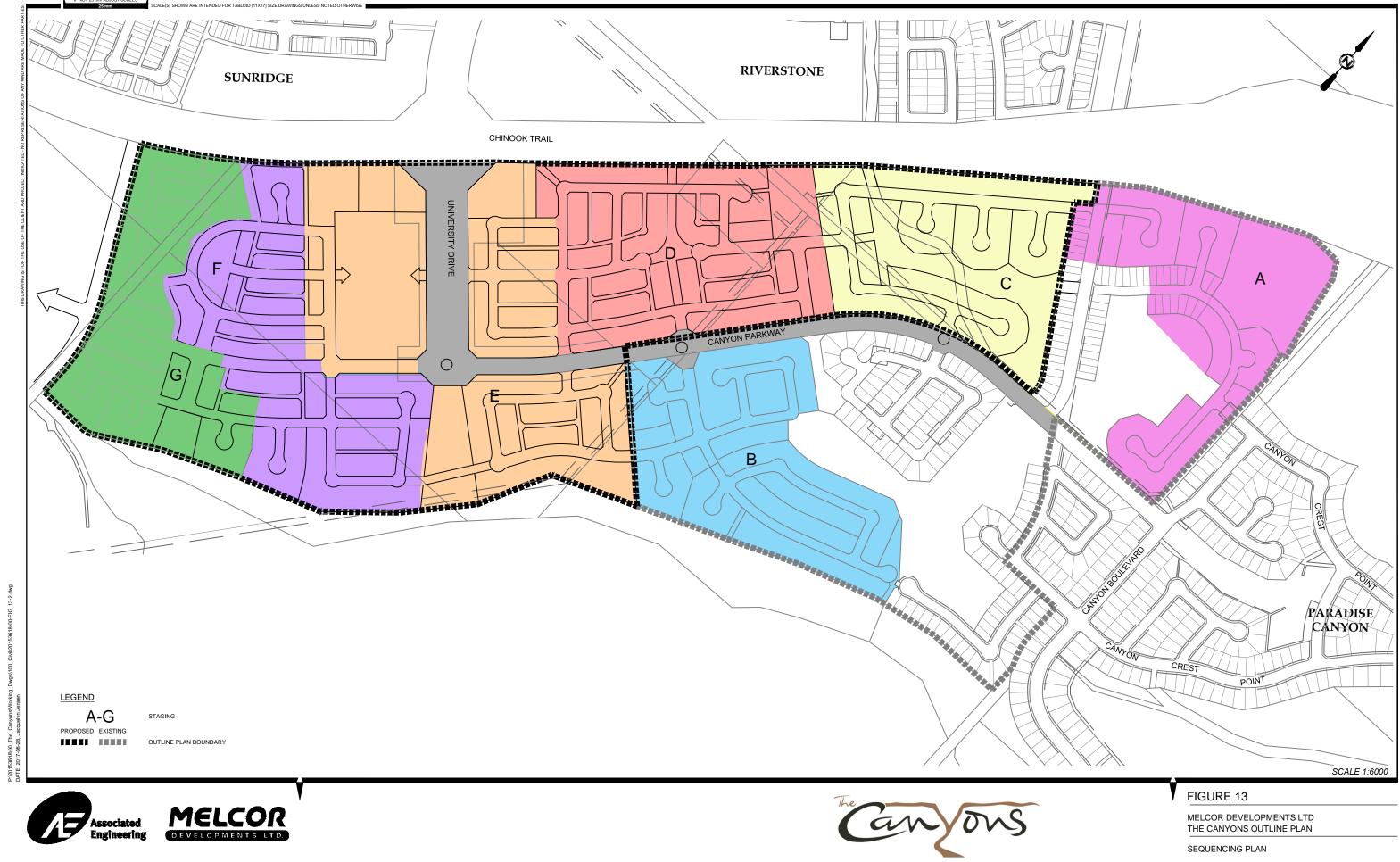
In general, phasing has occurred from an east to west direction on the south and north side of the supercollector bisecting the neighbourhood. Phasing will continue to move in an east to west direction. Subsequent to this, the areas to the east and southeast of the access arterial will be developed to complete all the works from the entrance arterial east.

Development must consider City of Lethbridge Standards with respect to Infrastructure looping, storm water management areas and vehicular and pedestrian access. Completion of individual stages of development will require careful consideration of the location and availability of services. Looping requirements for water services must ensure adequate level of service for users as areas are completed.

As indicated in the storm water section, the westernmost area of The Canyons will require additional storm water servicing provisions to the west of the plan area, prior to Stage G being initiated.

9.2 COMMUNITY MAIL BOXES

The final location of community mailboxes will be determined in consultation with Canada Post. Mailboxes will typically be placed behind the sidewalk along the long edge of corner lots or adjacent to open space entry points. Transit bus stop locations should not be combined with community mailbox sites.



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9.3 SHALLOW UTILITIES

In consultation with the respective utility companies, shallow utilities, including electrical services, telephone and cable required to service The Canyons will be extended into the plan area from the existing infrastructure. The City of Lethbridge is requesting that AltaLink move the existing electric transmission line in the Canyons outline plan area onto the Chinook Trail right of way. AltaLink cannot start work on the public consultation required by the Alberta Utilities Commission to facilitate the transmission line move until a continuous line assignment within the Chinook Trail right of way is available from the City of Lethbridge. Once the right of way purchases are complete and line assignment is provided to AltaLink it is anticipated that the transmission line move will be completed in an 18 to 24 month timeframe.

9.4 REDISTRICTING AND SUBDIVISION

Following the adoption of The Canyons Outline Plan, implementation of the Plan will be on a Stage-by-Stage basis achieved through the City's redistricting and subdivision process. Application for appropriate redistricting shall be consistent with the land use descriptions (based on proposed densities) provided within this document and the City of Lethbridge Land Use Bylaw (Bylaw No. 5700). Redistricting and subdivision applications will be advanced for specific stages in response to market demand.

9.5 AMENDING THE PLAN

The Canyons Outline Plan is intended to provide a detailed description and illustration of development such as land use, circulation, parks, open space and pathways. However, the Plan remains conceptual and is subject to alterations and adjustments as a result of market conditions, new standards, and consumer demand at the time of development. It is therefore important to create a flexible plan that still provides certainty to the City of Lethbridge and its residents. Requirements for the adoption of an Outline Plan are the responsibility of a Municipality. As such, it is the City of Lethbridge Municipal Planning Commission that approves Outline Plans and this process would apply to any subsequent amendment applications to The Canyons Outline Plan.