COUNTRY MEADOWS
OUTLINE PLAN AMENDMENT

FEBRUARY 2019

Prepared for:

BW2 WEST & 2014836 ALBERTA LTD.

Lethbridge, Alberta

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Project No. 112945195

112948170

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1 INTRODUCTION

This Country Meadows Outline Plan (OLP) Amendment is being prepared on behalf of BW2 West & 2014836 Alberta Ltd. ***Figure 2.1 Area Context Plan.***

While the original Country Meadows OLP encompassed an area of just over 300 acres in West Lethbridge, the proposed OLP Amendment area consists of the NE ¼ SEC 33-8-22-4 – an area of 142 acres. ***Figure 2.2 Existing Land Use*** highlights the original Country Meadows OLP area and the boundary of the OLP Amendment area. It should be noted that all related information in the OLP Amendment document refers to this indicated boundary.

The original Country Meadows OLP was approved by the Municipal Planning Commission on February 28, 2012 and this amendment will describe the proposed land use layouts and the corresponding impacts to the plan area. The design of the OLP was consistent with the policies and intent of the Country Meadows Area Structure Plan and remains so with this OLP Amendment.

The Country Meadows OLP Amendment has been completed to:

- Reflect current market trends and provide flexibility in future zoning through the removal of prescriptive land use designations.
- Reconfigure the land allocated to Open Space (P-B and P-R) and create a 10% Municipal Reserve.
- Describe adjustments to the local road network, storm water management, and proposed phasing necessitated by these revisions.
- Develop a coordinated approach of development between two land owners that promotes a logical extension of infrastructure and collaboration.
- Refine the plan for land use efficiency which will affect future affordability.

2 LOCATION & AREA CONTEXT

2.1 LOCATION

The Country Meadows Outline Plan area falls within the Country Meadows Area Structure Plan.

The subject lands are bounded on the east by the future Metis Trail West, on the south by the future Garry Drive West, on the north by Walsh Drive West and on the west by the future Chinook Trail. The Country Meadows Outline Plan is situated west of the existing West Highland's community and north of the future community of Garry Station. Directly to the north of Country Meadows, plans are being developed for a commercial area "The West Lethbridge Employment Centre."

2.2 TOPOGRAPHY

The subject lands consist of gently undulating prairie landscape that is typical of the Lethbridge region. In general, the lands slope from a centrally located plateau in all directions, with a maximum elevation difference of approximately 12-13m.

Appendix C – contains the *Geotechnical Evaluation*.

Appendix D – contains the *Phase 1 Environmental Site Assessment*.

2.3 EXISTING GROUND DISTURBANCE

Particular attention should be given to areas of existing development (farmsteads, dugouts, existing underground utilities, septic fields, solid waste pits and/or burn pits, etc.) Existing dugouts should be drained, all saturated material removed and backfilled with general engineered fill. At subdivision and detail design these features (dugouts and wetlands) will be identified and remediated under the supervision of a geotechnical engineer. All existing utilities (whether operational or abandoned) must be located. Existing utility trenches pose a particular risk due to settlement of backfill material. Care should be taken to ensure that all existing utility trenches are excavated to remove the utility and backfilled with general engineered fill. All other existing or historical ground disturbances should be removed and backfilled with general engineered fill. For further information refer to *Appendix C, Geotechnical Evaluation*.

2.4 EXISTING LAND USE & ZONING

The existing land use of The Country Meadows Outline Plan was classified as Agricultural which provided for cropland and other suitable agrarian endeavors.

The subject lands are currently designated Future Urban Development (FUD) on the eastern parcels of the plan area and Direct Control District (DC) Bylaw 4590 on the western parcel. The intent of the Future Urban Development District is to protect lands for future development and subdivision once appropriate servicing and planning policies have been implemented. The Direct Control District approved by Lethbridge City Council in 1993 permitted the subdivision of the quarter section into two equal parcels, allowing one dwelling unit for each parcel.

The surrounding land uses consist of existing residential housing to the east in the community of West Highlands; planned and approved residential development to the south in the development of Garry Station.

Figure 2.1, Area Context Plan – illustrates the location of Country Meadows within West Lethbridge

Figure 2.2, Existing Land Use – illustrates the current Land Uses within and surrounding the plan area.

The proposed Country Meadows OLP Amendment area consists of the NE ¼ SEC 33-8-22-4 – an area of 142 acres in West Lethbridge within the Country Meadows OLP area.
Figure 2.1, Area Context Plan and Figure 2.2, Existing Land Use have been updated to include this OLP amendment.

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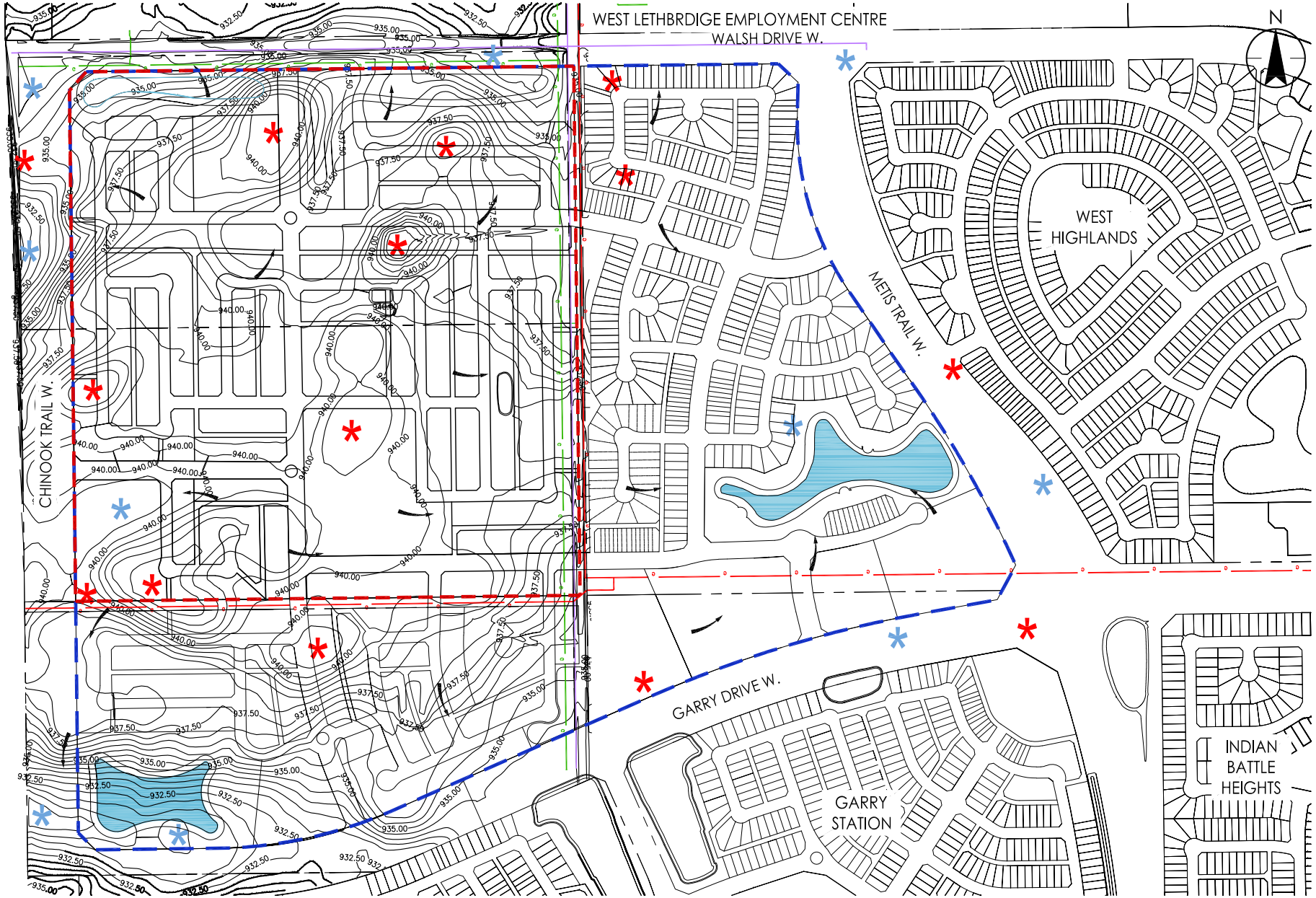

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Legend

- Country Meadows Boundary
- Country Meadows Amendment Boundary
- ATCO Gas
- ATCO Pipelines (High Pressure)
- Telus
- Fortis - Over head line
- Overland Flow & Spill Direction
- 940.00 Existing Ground Contours
- Low Point
- High Point

COUNTRY MEADOWS | FIGURE 2.1

Area Context Plan

Outline Plan Amendment

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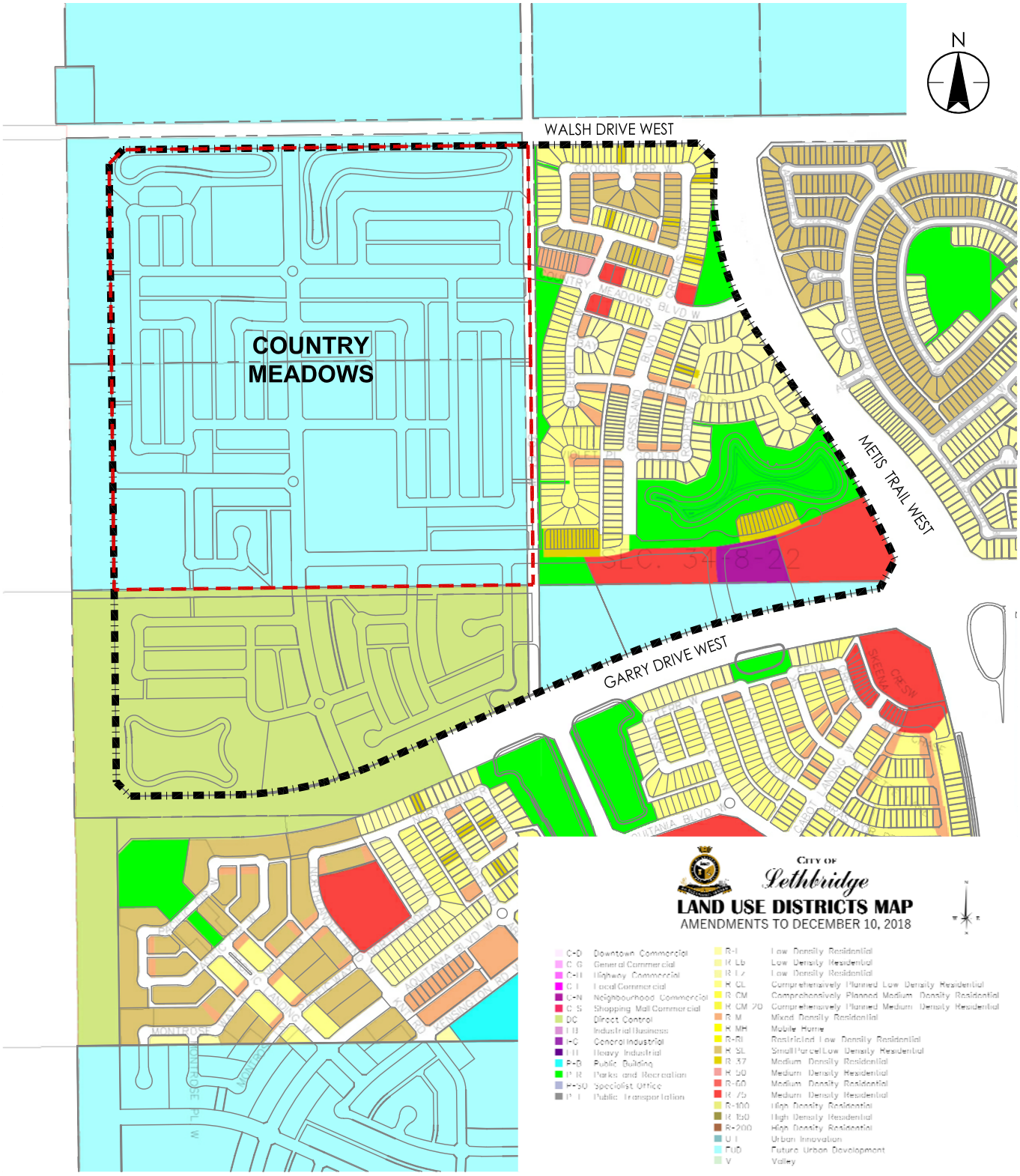

Note: Amendment Area is Future Urban Development

SCALE: 1:10,000

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Legend

- Country Meadows Amendment Boundary
- Country Meadows Outline Plan Boundary

COUNTRY MEADOWS | FIGURE 2.2

Existing Land Use

Outline Plan Amendment

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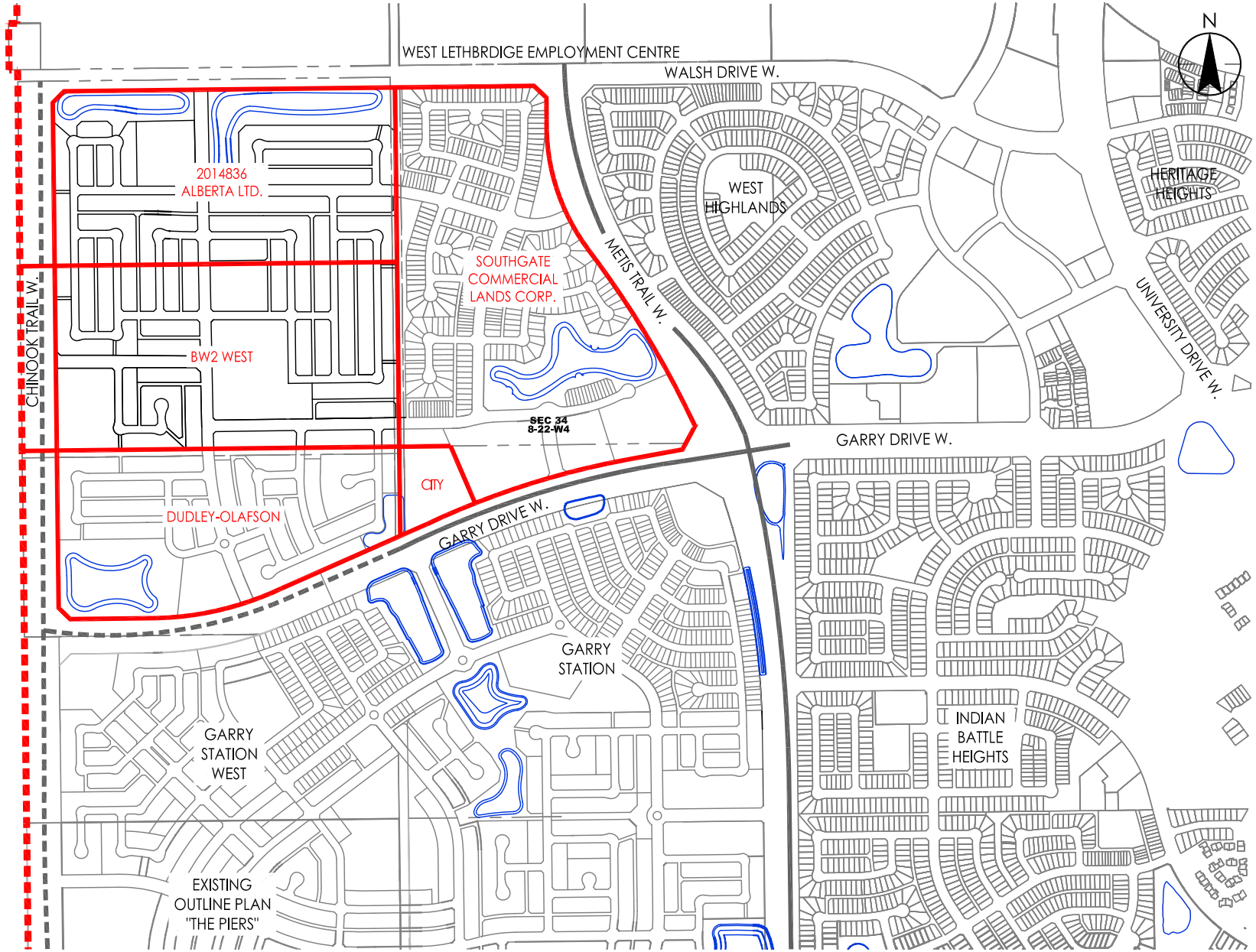
3 LAND OWNERSHIP

The Country Meadows Outline Plan area consists of 6 separate ownership parcels. The following outlines the land ownership and legal descriptions for the parcels within the Country Meadows Outline Plan boundary:

- Southgate Commercial Lands Corp. – Portions of the NW Quarter of Section 34, Township 8, Range 22, West of the Fourth Meridian containing 37.44 ha± (92.65 acres±).
- 2014836 Alberta Ltd. – the North Half of the NE Quarter of Section 33, Township 8, Range 22, West of the Fourth Meridian containing 27.51 ha± (67.98 acres±).
- BW2 West – the South Half of the NE Quarter of Section 33, Township 8, Range 22, West of the Fourth Meridian containing 29.57 ha± (73.07 acres±).
- Debra L. Dudley-Olafson – the North Half of the SE Quarter of Section 33, Township 8, Range 22, West of the Fourth Meridian containing 23.21 ha± (57.35 acres±).
- City of Lethbridge – Lot 1, Block 1, Plan 0814008 containing 2.06ha± (5.09 acres±).

The Certificates of Title have been provided in *Appendix A – Certificates of Title*.

Figure 3.1 Land Ownership identifies the ownership within the plan boundary.



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Legend

- City of Lethbridge Limits
- Country Meadows
- Future Arterial Roads
- Existing Arterial Roads

COUNTRY MEADOWS | FIGURE 3.1

Land Ownership

Outline Plan Amendment

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V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 3.1_land ownership_20171120.dwg

4 POLICY CONTEXT

The Country Meadows Outline Plan represents the next detailed level of planning within the framework of an overarching Area Structure Plan (ASP). That Plan – the Country Meadows Area Structure Plan – was approved by City Council as By-law 5629 in February 2010. The ASP document provided a general land use concept for the 122 ha that comprise the plan area, a servicing strategy, a proposed transportation network and a phasing scheme for the development of the lands. The guiding policies for the development of the Country Meadows Outline Plan are based on the principles set out in the Country Meadows ASP. The Outline Plan is also based on a number of related and complementary policies that comprise part of the City of Lethbridge's Integrated Community Sustainability Plan/Municipal Development Plan (By-law 5650, July 2010).

These policies and their relationship to the development of the Country Meadows Outline Plan are as follows:

1. ICSP/MDP Policy: Encourage and promote mixed-use development in residential neighbourhoods. *(Section 6.4.5.7)*

1.1 ASP Principle: Create a mixed-use community which is primarily residential in nature but includes the essential community services and amenities needed to create a complete neighbourhood.

- The Country Meadows Outline Plan is characterized by a mix of uses and amenities intended to meet the needs of a new and thriving neighbourhood. These include a range and variety of residential densities and housing types, a centrally-located elementary school, and a neighbourhood commercial site. The parks and open spaces of this plan – including an extensively linked linear park system - further contribute to this variety of land uses and to creating a quality living environment for future residents.

- Development statistics within the Country Meadows Outline Plan boundary are as follows:
    - Low density residential will account for 79% of residential land area (approximately 1240 units).

- Medium density residential will account for 21% of residential land area (approximately 666 units)
- Low Density Residential units will account for 56% of development and Medium Density Residential units will account for 44% of development.
- A neighbourhood commercial area will account for 3.11 acres (1.26 ha) of developable land.

At full buildout, Country Meadows will house approximately 5427 residents in 2206 units.

2. ICSP/MDP Policy: Encourage and promote a diverse range of housing that is incorporated in all new neighbourhoods. *(Section 6.4.5.6)*

   ICSP/MDP Policy: Encourage and facilitate the adequate supply of housing for all income groups. *(Section 6.2.1.3)*

   2.1 ASP Principle Establish a range of residential housing choices for various family types and for individuals of a range of ages and incomes, including single-family dwellings, medium density dwellings and senior-aged oriented dwellings and assisted-living facilities.

- The densities proposed in this plan range from single family (with lanes and without) comprising 56% of homes, through to townhouse and apartment units, which make up the remaining 44% of homes – permitting significant choice for home ownership - from detached units to condominiums. The Plan also offers substantial choice for renters. Indeed, the zoning category which will make provision for the largest number of units (968) in the planning area - R-75 - is a category intended for multiple unit dwellings.
- The developer wishes to ensure that buyers of homes in Country Meadows have the widest possible choice of housing types and building styles. Lot purchasers will therefore not be limited to having houses constructed solely by any "builders' group" carrying out home building in Country Meadows. Purchasers will be permitted to select their own builder and develop custom homes, provided these meet the Plan's architectural design standards.

3. ICSP/MDP Policy: Encourage and promote neighbourhood design in a manner that encourages interaction between all age groups. *(Section 6.4.5.10)*

   ICSP/MDP Policy: Encourage good quality architecture and streetscaping throughout the *City (Section 6.4.5.14)*

   3.1 ASP Principle Create variety in both residential form and lot type to enhance choice and foster diversity and visual interest.

- As the previous principle has noted, the Country Meadows Outline Plan will create a diverse range of housing opportunities by providing for a large range of residential zoning categories. Among these categories are the Urban Innovation Zone and the R-CL zone both of which were specifically included to encourage both innovative and visually creative projects in the community. The small parcel district (R-SL) has been included to permit wider lot choice. To ensure that this new community will meet the needs of many age groups, the medium density districts selected for inclusion in the Plan (R-37 and R-75) allow for senior citizen housing. Although no sites have been specifically selected for seniors housing, the large number of medium density sites provided in the Plan will offer opportunities in a variety of locales.

- The Country Meadows Outline Plan will strive to provide a visually appealing community. To achieve this, the Plan includes architectural standards that will apply to the housing projects throughout the neighbourhoods. Split rail fencing will transition to screen fences along roadways, fieldstone pillared arbour entry features will complement other community features, and natural timber elements, native grasses and flora will enhance the farming/ranching lifestyle. The open space system will meander throughout the community and bring focus to a gathering gazebo that will add character and aesthetic appeal to the plan area.

4. ICSP/MDP Policy: Design new neighbourhoods and retrofit existing neighbourhoods, to improve pedestrian and cyclist access to destinations within and outside of neighbourhoods *(Section 6.4.3.3)*

   ICSP/MDP Policy: Integrate transit with community planning and design. *(Section 6.4.2.2)*

4.1 ASP Principle — Provide a neighbourhood commercial area and a school site serving local residents via both pedestrian and vehicular connections.

- The Outline Plan includes both a public elementary school and a neighbourhood commercial site. Both sites are accessible by private as well as public transport. The proposed public transit routing system and the transit stops offer convenient service to the commercial parcel and the school as well as the community as a whole. A 1.5 km linear park system that takes advantage of the ATCO gas line easement acts together with other connections to form both a local pedestrian/cycling system in the community and a means of connecting to the regional pathway.
- Approximately 7.0 acres (2.8 ha) of "linear" open space will be provided for pedestrians and cyclists.
- Sidewalks complement the linear park system and ensure pedestrian access to all the major destinations both within and outside the plan area.

5. **ICSP/MDP Policy:** Encourage and promote the design of the built environment to encourage walkability (Section 6.4.5.4)

ICSP/MDP Policy: Incorporate a range of active and passive recreational opportunities into the open space system. (Section 6.4.6.2)

5.1 ASP Principle — Develop an integrated open space network, which creates a walkable and accessible environment, passive and active recreational amenities, and a highly aesthetic community thematic design which focuses on natural green and water oriented amenities.

- The open space system of the Country Meadows OLP is comprised of several diverse but interrelated components including the potential for an elementary school site with related amenities, a neighborhood park, a linear park system, a number of roundabouts providing a traffic calming effect to the plan area and promoting walkability.
- Open space (both creditable and non-creditable) accounts for more than 19% of the gross developable area (24.51 ha, 60.57 acres) in Country Meadows with land dedicated to a mix of uses including a school site, recreational opportunities, stormwater management, and public utilities.
- Streetscapes and storm water management facilities provide space for both active and passive recreation. Combined, these components will offer a significant range of recreational opportunity to the community. At the same time, accessibility to these sites will be enhanced through pathway and sidewalk linkages. The extensive pathway system – both local and regional - will offer an environment that not only facilitates walking and cycling, but indeed, encourages it.

6. ICSP/MDP Policy: Encourage and promote growth patterns that maximize the use of existing infrastructure and services in order to avoid or delay the construction of new infrastructure. *(Section 6.4.4.5)*

6.1 ASP Principle Establish a land use strategy that is practical, effective and cost efficient to facilitate development through strategic land use location and logical extension of servicing infrastructure.

- Servicing of the Country Meadows plan area is based on a logical and orderly extension of services from adjacent lands. The plan area is contiguous with other development areas that are either developed already or are scheduled for development. Servicing connections for storm, and sanitary requirements will be made via the adjacent West Highlands community. Long term needs for sanitary service will be provided in accord with the City's capital development schedule.
- The arrangement of land uses has taken into consideration the long-term needs of customers and the market. The central location of the elementary school provides minimal walking distances for students in the entire plan area. The commercial site is located to ensure maximum visibility and access from Garry Drive. The largest number of medium density sites has been located adjacent to open spaces to provide recreation opportunities for the highest concentration of residents. All of these uses are in the path of logical infrastructure servicing.

5 COMMUNITY VISION & DESIGN

In the early stages of the Country Meadows Outline Plan process, landowners and their consultants met with City Administration. The purpose of this meeting was to begin the process of establishing a direction for the community's vision and theme. Please refer to *Appendix J Gate 2 Sign-Off* for this preliminary Visioning document. The workshop also focused on the amenities, elements, ideas, must-haves, and concepts that enhance a community. Key themes emerged that were incorporated into the vision and design of the community included:

- Quality, yet affordable and practical variety of homes
- Innovative design that establishes community identity and character
- Owner and community ownership of sustainable practices
- Inclusion of active and passive parks, green spaces and community linkages
- A safe and mobile community

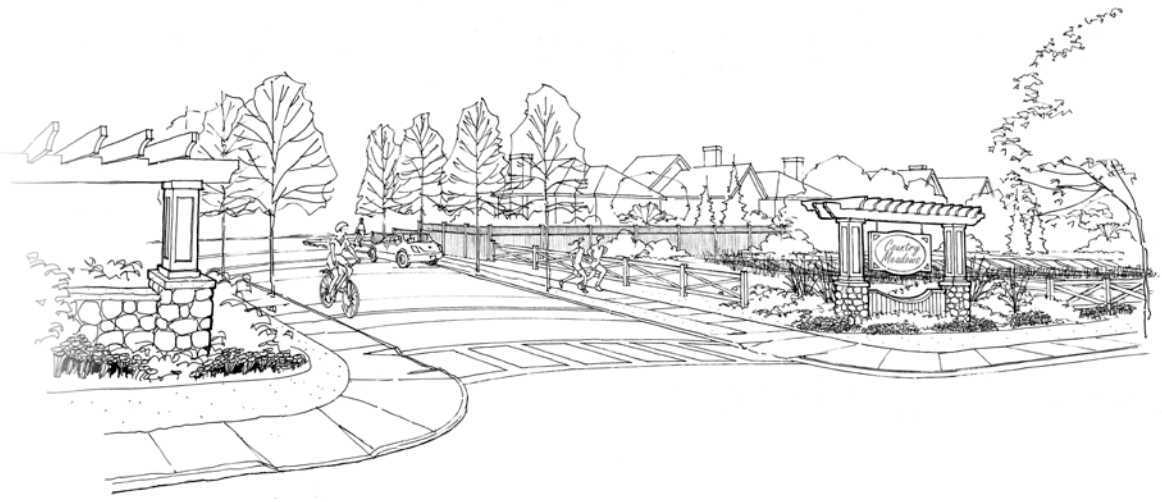
5.1 COMMUNITY VISION

Country Meadows, a pioneer's destination after a long journey west, is a logical extension of a theme developed in West Lethbridge since 2000---the early settlement of Western Canada.

From the Atlantic *Crossings* when new immigrants arrived at the *Piers* on Canada's Eastern shore, settlers from the east travelled by rail or wagon to western destinations like a *Garry Station*. Surrounding these destinations, communities would develop, and a new "country" style of living would be born.

The Vision for Country Meadows is the bringing together of a diverse multitude that developed their own unique style based on the natural materials at hand in Western Canada. The use of timber and fieldstone would become a hallmark of the farming and ranching lifestyle. However, there were those settler's whose lives were defined by a more manicured eastern style. Two story homes painted white with picket and split rail fencing. Visitors to these homes might pass beneath an arbour; in the evening, neighbours might gather at a community gazebo to share thoughts of their day.

In many respects, these two distinct styles came together and created a new landscape in and around Lethbridge and this is a key part of the vision of Country Meadows.



On the eastern half of the Country Meadows, a pond and wetlands will be the focal gathering point for the community. Split rail or cross-buck fencing in open spaces will transition to residential screen fences along arterial roadways; arbours will be incorporated at open space entrances. Fieldstone pillars will provide an anchor to fence lines and other features. Features such as a gazebo and canoe launch will allow residents to enjoy a range of leisure activities.

As development progresses west, it is anticipated that this estate country style might transition subtly with the introduction of timber elements indicative of a ranching/farming style. Fieldstone will be the anchor between the east and west side of Country Meadows as well as native prairie grasses and flora.

Inspired by a prairie landscape with expansive views, Southgate Commercial Lands Corp. representing six landowners, have teamed together to create a community representative of the pioneering spirit driven by family values.

Country Meadows will be a community built into the rolling prairies, where exploration along a network of pathways and inter-connecting green spaces hails a sense of wonder as the scenic Oldman River Valley welcomes them to a new place called home.

5.2 COMMUNITY DESIGN

A Visioning Workshop resulted in unique elements and characteristics that were consistent throughout the discussion and design charette included:

- A school site as a central hub for the community
- A strong connectivity among people that exhibited pronounced pedestrian and bicycle linkages
- Varied amenities that are well spread throughout the community
- Creative approaches to establish innovative opportunities from presently viewed constraints

The Country Meadows Outline Plan which evolved from the visioning workshop to the conceptual stage incorporated the above elements into a comprehensive community plan.

The concept is based upon a cellular grid system with a central elementary school at is core. The principal land uses in Country Meadows are residential. The arrangement of land uses recognizes the continued strong local demand for suburban style single detached homes but will also include more affordable multi-family sites. The mixed use area will include neighbourhood stores, zones of multi-family and low density residential. The plan will also incorporate Urban Innovation Zones that will be integrated into residential communities around small parks.

6 OPEN SPACE LAND USE

6.1 OPEN SPACE

The Open Space system within Country Meadows has been comprehensively designed to incorporate the ideas, concepts, and elements identified in the design workshop and the principles and objectives of the Area Structure Plan. Materials and elements used in the plan area will harmonize with the vision and theme as discussed in *Section 5 Community Vision & Design*. The entry feature of fieldstone pillar arbours along with native prairie grasses and flora provide a theming anchor throughout the community and split rail or cross-buck fencing transitioning to screen fences will be incorporated in open spaces. Timber elements will enrich the estate country style amenity features. The following summarizes the main amenities of the open space system:

- Neighbourhood Park

  The Neighbourhood Park will be designed for more passive recreational activities and serve as community gathering points. Some of the key elements planned for these parks include:

  - Gazebos or Open Air amphitheaters
  - Pathways
  - Natural Prairie Grasses and Wetlands
  - Playground Features
  - Natural Play Areas

  Neighbourhood parks with wet ponds should be planned to take advantage of pond water irrigation through a central pump station as well as use make-up (canal water) to top up the pond during drought conditions. Water line connections between parks areas should be installed through walkways and green belts but should limit conflict areas such as within carriage ways.

- **Potential School Site**

  The potential for a school site that is centrally located in Country Meadows has been provided. Currently the site is unassigned to any specific school district. The site could include a modern school building and a variety of recreational amenities which may include playground equipment, basketball court, and youth soccer pitch. The final programming requirements will be determined in consultation with school officials to ensure their needs are met. Should the parcel not be developed into a school site, a centrally located open space with unique amenities could be completed. Downsizing of the site, from the original plan, has been completed to align with current school site sizing trends within the City of Lethbridge.

- Frontage Parks *(Modified Pocket Park)*

  The design of these parks is integrated with the adjacent Urban Innovation (UI) District. The centrally located unique park design has housing fronting onto the park space, replacing the street with a pedestrian and bicycle corridor, creating a more pedestrian friendly environment as an alternative to conventional design where housing typically backs onto park space. Additionally, a second pocket park will function as a tot lot park featuring naturalized playscape features. The parks provide a visible amenity to residents walking to the northwest wet pond and creates a small MR pocket that will be linked to pathways and sidewalks. Comprehensive planning of this park will be required during the subdivision of the UI parcel.

- Linear Parks

  Linear Parks have been created along existing infrastructure channels and it is anticipated that they will provide interconnectivity between the community, elementary school and larger open spaces through local connector pathways. The connections will be designed to accommodate pedestrians/cyclists and promote alternative transportation within the community.

- Roundabouts

  Landscaping treatment of roundabouts will be finalized during detailed design at the subdivision stage.

- Storm Water Management Facilities

  The storm water management facilities have been incorporated into the open space designs throughout the community. The facilities will be utilized as an aesthetic amenity and function to enhance a sense of arrival and provide a visual park experience.

6.2 CONNECTIVITY

The visioning workshop identified a strong desire to create an efficient network of pathways to promote walkability and encourage alternate modes of transportation. The park network connects people to each area and is supported by strong pedestrian and bicycle routes throughout the community by local connector pathways.

The Country Meadows pedestrian network connects to the existing pathway to the Garry Station development and regional multi-use pathway to provide a strong pedestrian linkage south to the core commercial, educational and recreational amenities. This multi-modal linkage will provide residents in both communities with alternative modes of transportation to and from shared amenity spaces.

6.3 RESERVE DEDICATION ANALYSIS

The provision of public parks and open space within Country Meadows represents 10.1% of the net developable land. Final Municipal Reserve dedications will be finalized through subdivision process and payments of cash in lieu of dedicated space may be utilized by the developer if required. A summary of the total reserve dedication for Country Meadows is as follows:

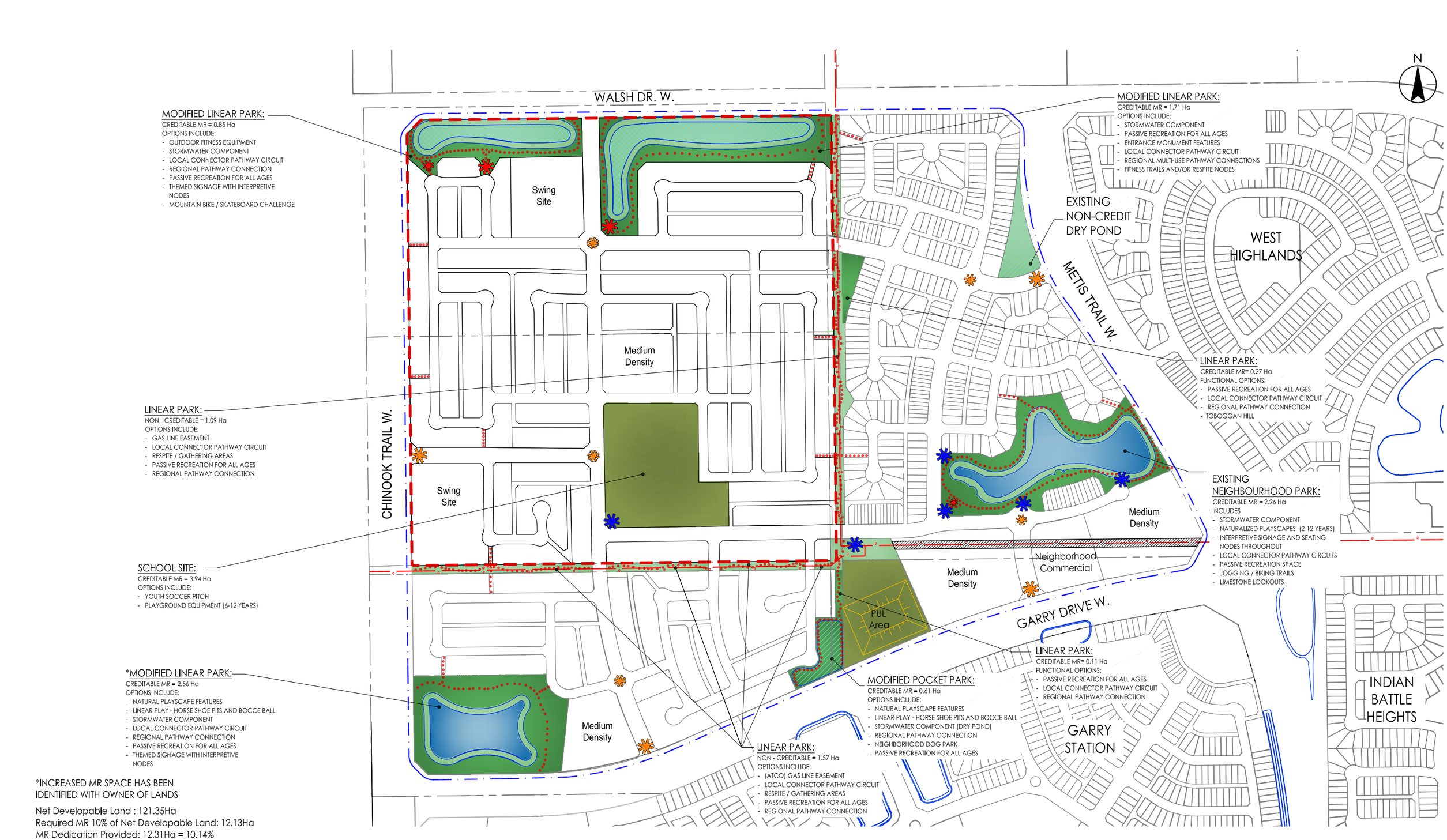
	Developable Area	Reserve Owing	Reserve Provided	Percent of Developable Area
Country Meadows	121.35 ha± (299.86 ac±)	12.1 ha± (29.90 ac±)	12.13 ha± (29.97 ac±)	10.14%

Land Owner Breakdown	Reserve Provided	Percent of Developable Area
Southgate Commercial Lands Corp.	2.53 ha± (6.253 ac±)	2.08%
2014836 Alberta Ltd.	2.56 ha± (6.33 ac±)	2.11%
BW2 West	3.94 ha± (9.74 ac±)	3.25%
Debra L. Dudley-Olafson	3.05 ha (7.54 ac±)	2.55%
City of Lethbridge	0.23 (0.57 ac±)	0.19%
TOTAL	12.31 ha± (30.42 ac±)	10.14%

Figure 6.1, Open Space Network – illustrates the prominent neighbourhood and open space that connects to the city's bikeway and pathway network.

6.4 SEASONAL WET AREAS

The developer shall submit Alberta Environment approval concurrent with any request to begin area grading on any seasonal wet area identified in supporting studies. Requirements can be found in the Provincial Wetland Restoration/Compensation Guide, Alberta Environment.



*INCREASED MR SPACE HAS BEEN IDENTIFIED WITH OWNER OF LANDS

Net Developable Land : 121.35Ha
Required MR 10% of Net Developable Land: 12.13Ha
MR Dedication Provided: 12.31Ha = 10.14%

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February 6, 2019

Legend

- Country Meadows Amendment Boundary
- Public Building, Parks & Recreation (P-B)
- Parks and Recreation (P-R)
- Open Space (OS n/c)
- Stormwater Management Facility (Wet Pond)
- Stormwater Management Facility (Dry Pond)
- Stormwater Management Facility (Hybrid Pond)
- Local Connector Pathways
- Regional Multi-Use Pathway
- Themed Gateway Entrance to Park
- Themed Park Amenity Features
- Community Entry and Themed Elements
- PUL — Public Utility Lot

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COUNTRY MEADOWS | FIGURE 6.1

Open Space Network

Outline Plan Amendment

PREPARED FOR: BW2 WEST & 2014836 Alberta Ltd.

7 RESIDENTIAL LAND USE & DENSITY

The land use districts selected provide the opportunity for single-family homes both laned and laneless, duplex dwellings, and multi-family units including townhomes, and apartments. The selected land uses also provide the opportunity for innovative housing and mixed use developments including a Neighbourhood Commercial zone.

The intent of the Country Meadows OLP amendment is to promote a variety of residential land uses, and to provide a wide range of housing opportunities and levels of affordability. ***Figure 7.1, Proposed Land Use,*** identifies the amended layout and proposed general land uses within the Country Meadows OLP Amendment area boundary and identifies the general existing land uses that have developed since the Original OLP was approved. The use of general land use descriptions rather than prescriptive zonings has been completed at the request of City of Lethbridge Planning. Future prescriptive land use re-zonings will be completed at the time of subdivision. Proposed General Residential Land Uses include Low Density Residential and Medium Density Residential. Unit Statistics are derived as follows:

- Amendment Area: Low Density 25uph, Medium Density 75uph
- Southgate Commercial Lands: Actual completed units and 75uph for undeveloped medium density
- Dudley-Olafson Lands: Blended Rate for Low Density and 75uph for medium density

Appendix N - Figure 7.2, Proposed Land Use by Owner has been added to show the individual statistics of both owners within the amendment area. The combined amended land use statistics, number of units, and population estimates are detailed in ***Table 7.1 Land Use and Population Estimates*** below.

The following is a list of proposed Land Use Districts that may be considered at the time of Land Use Re-designation:

- Low Density Residential District (R-L)
- Comprehensively Planned Low Density Residential District (R-CL)
- Small Parcel Low Density Residential (R-SL)
- Medium Density Residential (R-37)
- Medium Density Residential (R-75)220
- Mixed Density Residential (R-M)
- Neighbourhood Commercial (C-N)
- Urban Innovation (UI)

Figure 7.1, Proposed Land Use identifies the layout and proposed land uses within the Country Meadows Outline Plan boundary.

7.1 LAND USE SUMMARY AND STATISTICS

The following table summarizes the land uses and provides statistics for the Country Meadows Outline Plan application.

7.2 SWING SITES

Two swing sites have been identified within the Amendment boundary to provide further development flexibility and opportunity for mixed housing forms. Options for the sites include: neighbourhood commercial, religious assembly, and medium density residential. A combination of these uses is acceptable. Specifics with respect to an internal road layout, land use, density, etc. shall comply with the Country Meadows Outline Plan, and will be reviewed/approved at the time of land use designation and subdivision application.

7.3 ATCO PIPELINE RELOCATION

Should the gas line be relocated in the future, Figure 7.1, Proposed Land Use Designations, identifies a potential alternate layout for the Olafson Lands. Discussions around the potential relocation of the ATCO pipeline, that runs through the Outline Plan Area, have been ongoing since the adoption of the Country Meadows Outline Plan in 2012. Current City of Lethbridge Land Use Bylaw 5700, Section 9.16 states that *"a minimum distance between the gas line and a wall of a building shall be 15.25m."*

7.4 SECONDARY SUITES

Siting of secondary suites on single detached lots shall be finalized at the time of zoning and must consider infrastructure capacities, access and parking. 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 roundabouts where parking will not be an issue.

Table 7.1
Land Use and Population Estimates

	Area (ha)	Area (ac)	% of GDA	Population Estimates			
				Density	Density	Total	Area
Residential Land Use				(UPH)	(UPA)	Units	Population
Gross Area	121.35	299.86					
Environmental Reserve	0.00	0.00					
Gross Developable Area (GDA)	121.35	299.86					
Public Land Use							
Public Right of Ways	29.37	72.58	24.20%				
Open Space (P-B)	3.94	9.74	3.25%				
Open Space Creditable	8.37	20.68	6.90%				
Open Space Non Creditable	12.20	30.15	10.05				
Public Subtotal	53.88	133.15	44.40%				
Low Density Residential (BW2 West)	14.05	34.72	11.58%	25	10	351	1017
Low Density Residential (2014836 Alberta Ltd.)	13.19	32.59	10.87%	25	10	330	957
Low Density Residential (Dudley-Olafson Lands)	11.09	27.40	9.14%	***22.8	9	253	733
Low Density Residential (Southgate Commercial Lands)	14.24	35.19	11.73%	**22.3	9	*306	887
Low Density Sub Total	52.57	129.90	43.32%			1240	3594
Medium Density Residential (BW2 West)	1.27	3.14	1.05%	75	30	95	180
Medium Density Residential (Dudley-Olafson Lands)	1.39	3.43	1.15%	75	30	104	197
Medium Density Residential (Southgate Commercial Lands)	5.35	13.22	4.41%	75	30	403	761
Existing/ Future Row Medium Density Residential (Southgate Commercial Lands)	1.59	3.93	1.31%	**40.3	16.3	*64	121
Medium Density Sub Total	9.60	23.72	7.92%			666	1259
Swing Site (BW2 West)	2.26	5.58	1.89%	75	30	169	321
Swing Site (2014836 Alberta Ltd.)	1.78	4.40	1.47%	75	30	133	253
Swing Site Sub Total	4.04	9.98	3.36%			302	574
Residential Sub Total	66.21	163.60	54.56%			2206	5427
Neighborhood Commercial	1.26	3.11	1.04%				
Total	121.35	299.86	100.0%				

Notes:
*Actual Unit Counts were used
**UPA Calculated based on Existing Build Out information
***UPA Calculated from a blend of the Specific Land Use Designations from Original OLP
All Open Space (P-B) is Creditable MR
UPH-Units per Hectare
UPA-Units per Acre

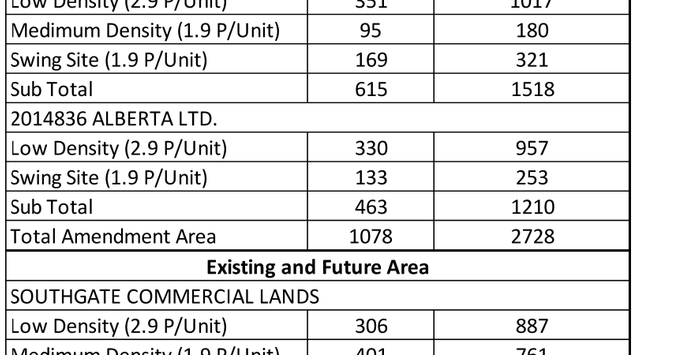
Low Density Residential	2.9	people/Unit
Medium Density Residential	1.9	people/Unit

A comparison of original development and proposed development statistics is provided in ***Table 7.2 Population/Units Comparison*** below.

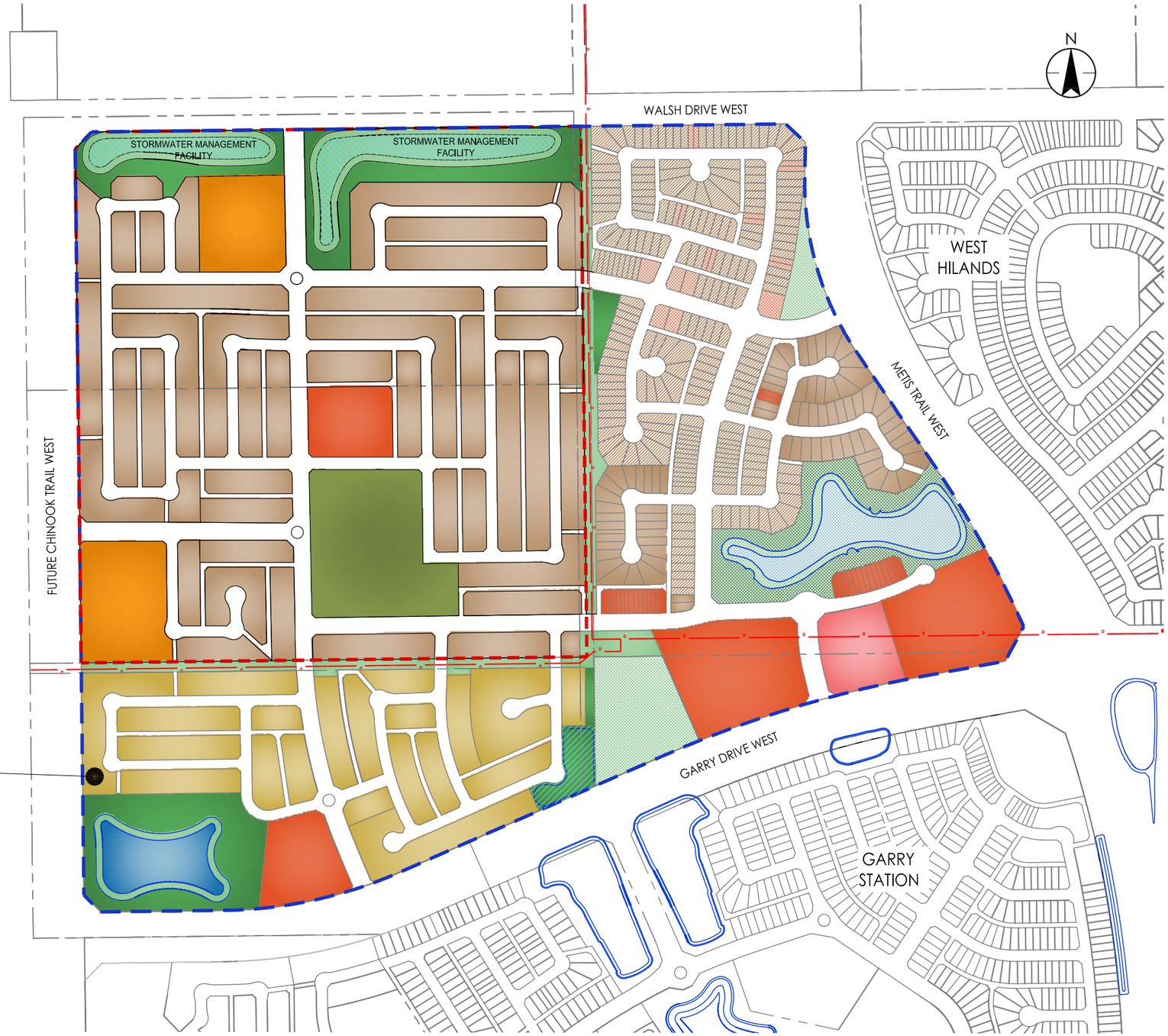
Table 7.2
Population/Units Comparison

	Total Units	Area Population
Original Outline Plan Land Use	2125	5103
Revised Land Use	2206	5427
Net Increase (+)/Decrease (-)	**+81**	**+324**

Country Meadows Unit / Population Statistics By Owner		
Amendment Area		
BW2 WEST		
	Total Units	Area Population
Low Density (2.9 P/Unit)	351	1017
Medimum Density (1.9 P/Unit)	95	180
Swing Site (1.9 P/Unit)	169	321
Sub Total	615	1518
2014836 ALBERTA LTD.		
Low Density (2.9 P/Unit)	330	957
Swing Site (1.9 P/Unit)	133	253
Sub Total	463	1210
Total Amendment Area	1078	2728
Existing and Future Area		
SOUTHGATE COMMERCIAL LANDS		
Low Density (2.9 P/Unit)	306	887
Medimum Density (1.9 P/Unit)	401	761
Existing and Future Row Medium Density (1.9 P/Unit)	64	121
Sub Total	771	1769
DUDLEY-OLAFSON		
Low Density (2.9 P/Unit)	253	733
Medimum Density (1.9 P/Unit)	104	197
Sub Total	357	930
Total Existing/Future Area	1128	2699
Country Meadows Total	2206	5427
2012 OLP	2125	5103
Net Increase(+) / Decrease(-)	+ 81	+ 324



ALTERNATE SHADOW PLAN
OLAFSON LANDS
Note: MR Dedication would remain the same. Land Owner has been consulted with respect to MR & Stormwater Facility Changes.



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January 24, 2019

Legend

- Country Meadows Boundary
- Country Meadows Amendment Boundary
- High Pressure Gas

Proposed	Existing	
		Low Density Residential
		Medium Density Residential
		Swing Site
		Neighborhood Commercial

Proposed	Existing	
		Open Space (Credit)
		Open Space (Non-Credit)

Proposed	Existing	
		Future School Site
		Stormwater Management Facility (Wet Pond)
		Stormwater Management Facility (Dry Pond)
		Stormwater Management Facility (Hybrid Pond)

COUNTRY MEADOWS | FIGURE 7.1

Proposed Land Use
Overall Population Statistics

PREPARED FOR: BW2 WEST & 2014836 ALBERTA LTD.

V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 7.1_land use_20180326.dwg

8 ARCHITECTURAL STANDARDS

The built form of the development will be subject to architectural standards and design guidelines. These guidelines will be initiated and implemented by the development team and will include design guidelines such as:

- Minimum/Maximum building footprints;
- Requirements for attached/detached garages;
- Fencing design and materials;
- Roofing materials;
- Diversity of building design;
- Exterior finish; and
- Landscaping requirements.

The detailed design guidelines will be developed and enforced at the subdivision stage of development. In general terms, the use of fieldstone and local materials will be promoted to establish a "Country Style" as outlined in Section 5. It is anticipated that a "craftsman" or "country estate" style of architecture will be the focus of development east of 30th Street and that "ranch" style elements may be incorporated into neighbourhoods west of 30th Street.

9 TRANSPORTATION

Figure 9.1 Preliminary Transportation Network has been updated to reflect the proposed amendment and identifies proposed roadway classifications, intersection spacings and Roundabout locations.

Figure 9.2 Roundabouts: Lotting Concept & Restriction has been deleted from future design criteria to reflect the current roundabout initiatives for Collector-Collector intersections within the City of Lethbridge. Refer to item 9.3 below.

An updated Transportation Impact Assessment (TIA) that reflects the proposed amendment is included in ***Appendix B***. The analysis indicates the additional units will have a minor impact to the anticipated operations of surrounding internal intersections and broader external intersections. The intersection geometries and traffic control measures previously assumed as part of the Country Meadows TIA are expected to be adequate to accommodate the proposed land use revisions.

9.1 ARTERIAL ROAD DEVELOPMENT, DRAINAGE & SITE ACCESS

Country Meadows will be bounded by future arterial roadways on all 4 of its boundaries. Metis Trail on the east and Garry Drive on the south boundary have undergone a functional design process which established the alignment and grade for Metis Trail and Garry Drive. Walsh Drive on the north boundary is existing and consideration of existing grades has been considered in the preparation of this document. The future Chinook Trail on the west boundary is yet to be designed; however, existing topography in the area has been considered in the development of grading and drainage.

Country Meadows has 5 access points as indicated in *Figure 9.1: Preliminary Transportation Network* and described below:

Walsh Drive West:	1 access
Metis Drive West:	1 access
Garry Drive West:	2 accesses
Chinook Trail West:	1 access

Emergency Services Access shall be provided to the development during phases development. Please refer to Section 12 for information on Interim Secondary access location options.

Drainage from arterial roads has been accommodated up to the centre line of the adjacent arterial, drainage, and topography from beyond the centre line has been considered in the development of this Plan. Please refer to *Section 11.1 Stormwater Management* for more details.

9.2 ROAD CLASSIFICATIONS

A circulation collector roadway has been established through previous planning at the Area Structure Plan level.

Centerline to Centerline spacing has been identified on the future collector roads shown on *Figure 9.1 Preliminary Transportation Network*. The following is a list of Roadway Classifications that have been proposed for Country Meadows. Refer to *Appendix B Traffic Impact Assessment* for final roadway classifications.

- Community Entrances / Super Collector
- Major Collectors
- Minor Collectors
- Local Roads & Cul-de-sacs
- Lanes

9.3 ROUNDABOUTS

In areas where roundabouts are located on residential frontages, neither parking nor driveway access shall be permitted between the outside edge of crosswalk and the circulatory roadway. Roundabouts will be appropriately sized, accommodating WB-17 left turn movements, City Bus and Fire Truck U-Turn movements, with a minimum 4 metre diameter raised centre island; including mountable aprons.

9.4 TRANSPORTATION IMPACT ASSESSMENT

A Transportation Impact Assessment (TIA) has been completed following City of Lethbridge TIA guidelines and roadway classifications have been determined using City of Lethbridge Design Standards 2011. Refer to *Appendix B Traffic Impact Assessment and Community Entrance Noise Assessment*.

9.5 NOISE LEVEL ASSESSMENT

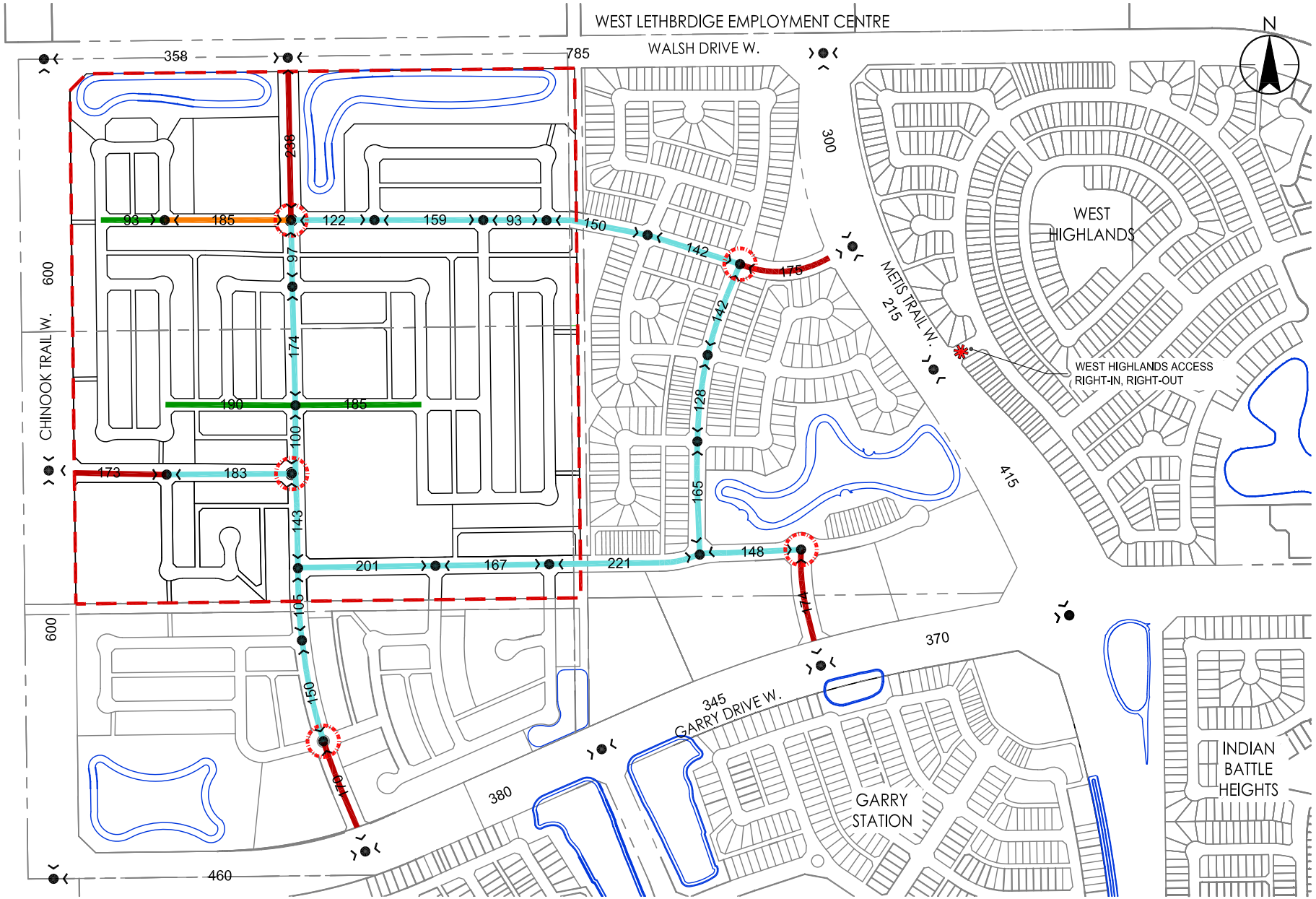
A Community Entrance Traffic Noise Assessment has been completed. The purpose of the assessment is to provide noise attenuation design requirements at the 10 year and, if required,

20 year horizon for the surface traffic resulting from the proposed Community Entrance Road connecting Metis Trail on the east side of Country Meadows.

Two scenarios were analyzed in the report: Scenario 1 - level lots layout assumptions and Scenario 2 - walkout lot substitutes. For both scenarios noise levels are expected below the City of Lethbridge LEQ noise limit of 60 dB(A) for roadways classified as non-truck routes in the 10 year horizon. Therefore, no sound attenuation measures are required for Country Meadows, and an analysis of the 20 year horizon data will not be required. Refer to *Appendix B Traffic Impact Assessment and Community Entrance Noise Assessment* for further details of the assessment.

9.6 CHINOOK TRAIL & COMMUNITY ENTRANCE

The completion of the Chinook Trail Right of Way from the transportation perspective is not anticipated to be completed in the near term. However, infrastructure installations (high pressure gas line relocation and overhead electrical transmission lines) are anticipated in the near term within this future Right of Way.



Notes: Refer to Appendix C, TIA Detailed Roadway Analysis.

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January 24, 2019

Legend

- Country Meadows Amendment Boundary
- Community Entrance/Super Collector
- Major Collector
- Minor Collector
- 18.5m Local Road (11m Asphalt)
- ●〈100m〉● Intersection Spacing
- Roundabout

COUNTRY MEADOWS | FIGURE 9.1

Preliminary Transportation Network

Outline Plan Amendment

PREPARED FOR: BW2 WEST & 2014836 Alberta Ltd.

V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 9.1_transportation network_20171120.dwg

10 TRANSIT & MAILBOX SERVICES

10.1 TRANSIT ROUTES

Transit Routes shall be planned for bi-directional service utilizing collector roads. Transit routing is at the discretion of the City of Lethbridge Transit Department and subject to the City's transit master plan.

10.2 COMMUNITY MAILBOX LOCATIONS

The final location of community mailboxes will be determined in conjunction with Canada Post at the time of detailed design. Community mailboxes are typically located adjacent the City sidewalk along the long frontage of corner lots, or along the openings to park space. Transit bus stop locations will not be combined with community mailbox sites.

11 SITE SERVICING

The following sections provide a brief overview of the servicing strategy for Country Meadows. It is understood that final designs at the time of subdivision will adhere to current municipal and provincial standards.

11.1 STORM WATER MANAGEMENT

11.1.1 Background Information

Where practical, catchment areas have been defined by natural topography in an effort to minimize excessive earthwork; these boundaries extend to the centerline of the adjacent arterial roadways thereby allowing for the combined control of runoff from the development and arterials with the exception of the northeast corner of Country Meadows, where existing topography and functional road design make a combined Stormwater Management Facility prohibitive.

Due to offsite constraints, Country Meadows storm water ponds will need to operate at a "zero" release rate. The City has indicated that Country Meadows storm water detention facilities will need to connect to the 1800mm diameter storm line that extends from the west boundary of West Highlands along the projection of Tartan Boulevard. Record drawings indicate that the depth of this existing line should be sufficient in order to service the western boundary of the development.

The City has indicated that storage of 1000m^3/ha should be allowed for at the Outline Plan stage of planning. This is a volume equivalent to the 90% of the 1:100 year, 24 hour rainfall volume (~110mm rainfall). This is based on no allowance for initial abstraction, depression storage or infiltration.

11.1.2 Design Assumptions

The development area has been divided into 6 catchments that drain into 6 ponds. The ponds and catchment areas have been identified on *Figure 11.1A – Stormwater Management Major System.*

As specified in the City of Lethbridge Design Standards, storm water ponds must be designed to fully accommodate runoff from the 1:100 year, 24 hour rain event. As shown in Table 1, the ponds are capable of accommodating this volume.

With regard to pond discharge, it is anticipated that all pond outlets will connect to a future sewer trunk that will extend from the existing 1800mm diameter pipe located at the west end of Tartan Boulevard in the West Highlands Area. All ponds will be serviced by a minor storm sewer system sized to convey runoff from up to the 1:5 year rainfall event.

Design Criteria used for the major and minor storm sewer systems are:

- 1 000m^3/ha of detention storage
- 200 L/s/ha for Major System Flows
- 90 L/s/ha for Minor System Flows

Overland flow routes are to be designed to convey the 1:100 year storm event and not exceed Alberta Environment guidelines for safe velocities and depths. Overland flow routes will incorporate trapped lows at strategic locations. Trapped low areas will:

- Increase surface run-off capture
- Provide for energy dissipation during extreme rain fall events ("stilling" basins)
- Allow for the practical creation of overland flow routes given localized topographical constraints.
- Meet City of Lethbridge design guidelines for maximum depth of 300mm.

In addition to the above, overland flow within a drainage boundary has been proportioned in a way that evenly distributes overland flow routes throughout the drainage boundary. This has been completed to reduce the cumulative effects of long overland flow routes. Special attention at the detailed design stage may be required where two intersecting overland flow routes meet. Where possible, this point of intersection should occur in close proximity to a storm water management facility.

The final design of overland flow routes must be confirmed during the detailed design of a storm water management facility and its upstream catchment.

In areas where the back of lots drain to an arterial right of way, the City will require (at subdivision and detailed design) that either the arterial road and associated drainage system be constructed to convey storm water to an approved detention facility, or, in the absence of arterial road development, the lots be designed to drain from back to front.

11.1.3 Proposed Storm Water Management Infrastructure

This amendment proposes minor changes to storm water management to accommodate the reconfiguration of open space and the additional residential development. The pond catchments have been revised to follow natural topography where possible.

Future Pond Designs must consider water quality best practices including the supply of make-up water and effects of solar heating. Refer to ***Figure 11.1B – Stormwater Management Minor System*** or proposed make up water supply line alignment. Final determination of pond areas, volumes and upstream catchments will be required during detailed master servicing design and subdivision. It is recommended that other stormwater management strategies and systems be investigated at detailed design including combination facilities, treatment forebays, wetlands and green infrastructure (low impact design techniques). These facilities have been identified as hybrid ponds. Provision for a make-up water system from Garry Drive should be implemented along the central north-south green strip.

Pond A is an existing wet pond that discharges to an existing storm trunk extending from Tartan Boulevard. Pond catchment areas will remain unchanged.

Pond B is an existing dry pond that discharges to an existing storm trunk in Metis Trail. Pond catchment areas will remain unchanged.

Pond C has been designated a Hybrid Pond. The facility's location has been chosen due to natural topography and its service boundary has increased and has been accounted for in Table 1. Ultimately, the facility will discharge to a future trunk line in Walsh Drive as identified in the Walsh Drive Preliminary Design Report November 2012 (drawings included in ***Appendix M - Walsh Drive Preliminary Design Report*** drawings). In the interim, this pond will discharge to Country Meadows Boulevard via a temporary lift station.

Pond D has been designated a Hybrid Pond. The facility's location has been chosen due to natural topography and its service boundary has increased and has been accounted for in Table 1. Ultimately, the facility will discharge to a future trunk line in Walsh Drive as identified in the Walsh Drive Preliminary Design Report November 2012. In the interim, this pond will discharge to Country Meadows Boulevard via a temporary lift station and be connected to Pond C via a large diameter pipe.

Pond E has been designated a Wet Pond. The facility's location has been chosen due to natural topography and its service boundary has decreased and has been accounted for in Table 1. The facility will discharge to a future trunk line in Metis Trail.

Pond F has been designated a Dry Pond and has been created due to natural topography and the functional design grades of Garry Drive. The facility will discharge into a future storm trunk line in Garry Drive.

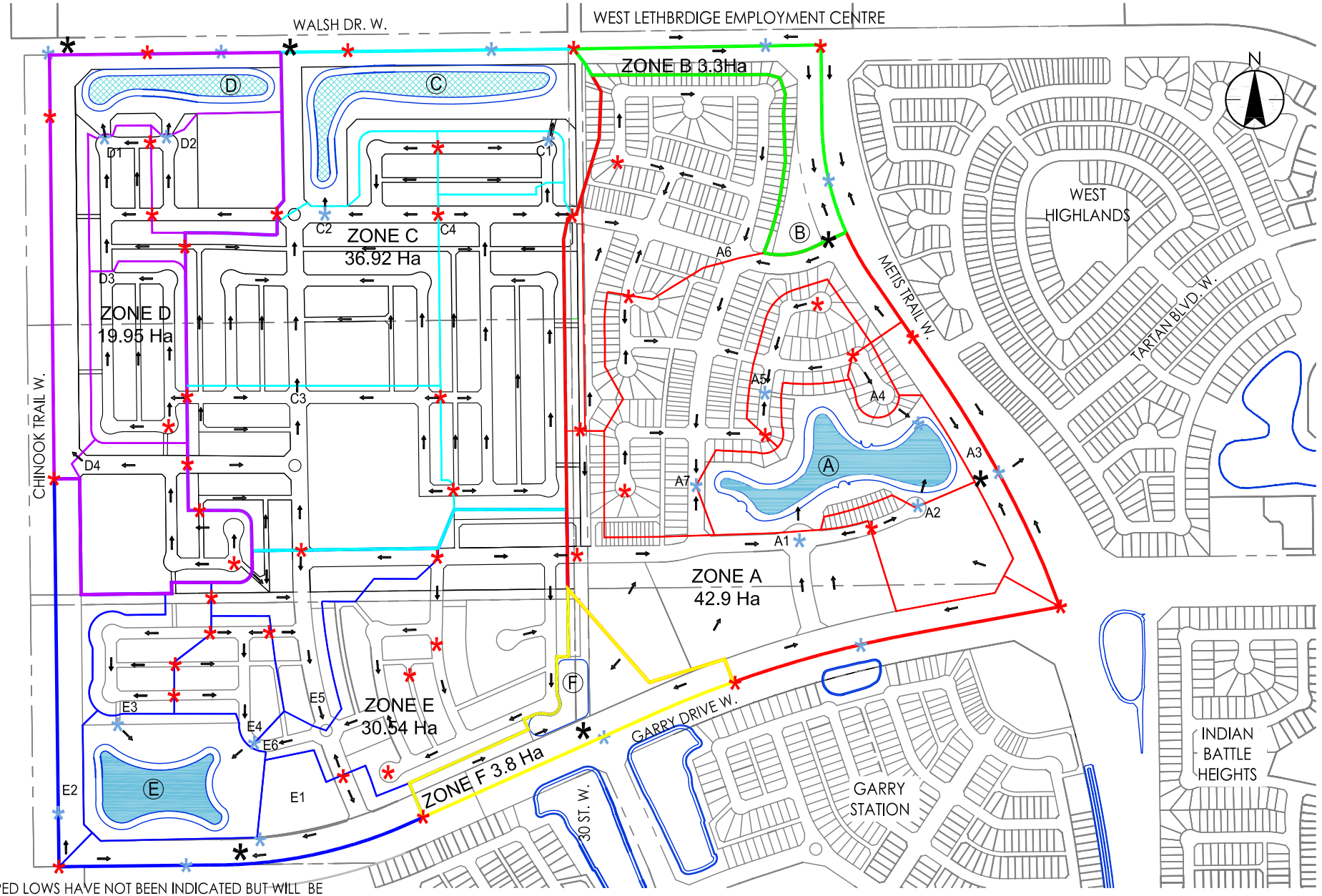
Figure 11.1A Storm Water Management Major System has been updated to reflect the proposed amendment and future pipe information has been moved and added to an additional *Figure 11.1B Storm Water Management Minor System* to add clarity.

Table 1: Pond Statistics

Drainage Boundary & Pond	Pond Type	Catchment Area	Active Storage Pond Volume
A	Wet	42.9 ha	42,900 m³
B	Dry	3.3 ha	3,300 m³
C	Hybrid	36.9 ha	36,900 m³
D	Hybrid	19.9 ha	19,900 m³
E	Wet	30.5ha	30,500 m³
F	Dry	3.8 ha	3,800 m³

Table 2: Minor & Major Storm Flows

Catchment		Sub Catchment*		Minor System Flow m³/s	Major System Flow m³/s
ID	**Area (ha)**	**ID**	**Area (ha)**		
A	42.9	A1→Pond	10.3	0.9	2.1
		A2→Pond	3.0	0.3	0.6
		A3→Pond	2.0	0.2	0.4
		A4→Pond	0.5	0.05	0.1
		A5→Pond	2.3	0.2	0.5
		A6	9.2	0.8	1.8
		↳ A7→Pond	9.0	0.8	1.8
		Subtotal	18.2	1.6	3.6
		Pond "A" Area	6.6	N/A	N/A
		Total Area "A"	42.9	N/A	N/A
B	3.3	Total Area "B"	3.3	0.3	0.7
C	36.9	C4	8.6	0.8	1.7
		↳ C1→Pond	1.7	0.1	0.3
		Subtotal	10.3	0.9	2.0
		C3	8.7	0.8	1.7
		↳ C2→Pond	10.7	1.0	2.1
		Subtotal	19.4	1.8	3.8
		Pond "C" Area	7.2	N/A	N/A
		Total Area "C"	36.9	N/A	N/A
D	19.9	D3	3.7	0.3	0.7
		↳ D1→Pond	2.1	0.2	0.4
		Subtotal	5.8	0.5	1.1
		D2→Pond	3.3	0.3	0.6
		D4→Pond	4.5	0.4	0.9
		Pond "D" Area	6.3	N/A	N/A
		Total Area "D"	19.9	N/A	N/A
E	30.5	E1→Pond	3.6	0.3	0.7
		E2→Pond	2.7	0.2	0.5
		E3→Pond	2.4	0.2	0.4
		E4→Pond	2.1	0.2	0.4
		E5	3.5	0.3	0.7
		↳ E6→Pond	11.5	1.0	2.3
		Subtotal	25.8	2.3	5.2
		Pond "E" Area	4.7	N/A	N/A
		Total Area "E"	30.5	N/A	N/A
F	3.8	Total Area "F"	3.8	0.3	0.8



NOTE: TRAPPED LOWS HAVE NOT BEEN INDICATED BUT WILL BE INCORPORATED AT STRATEGIC LOCATIONS DURING DETAILED DESIGN.

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February 6, 2019

Legend

- Overland Flow Direction
- High Point
- Low Point
- (E) Pond Identification
- Sewer Connection Points
- Wet Pond
- Dry Pond
- Hybrid Pond

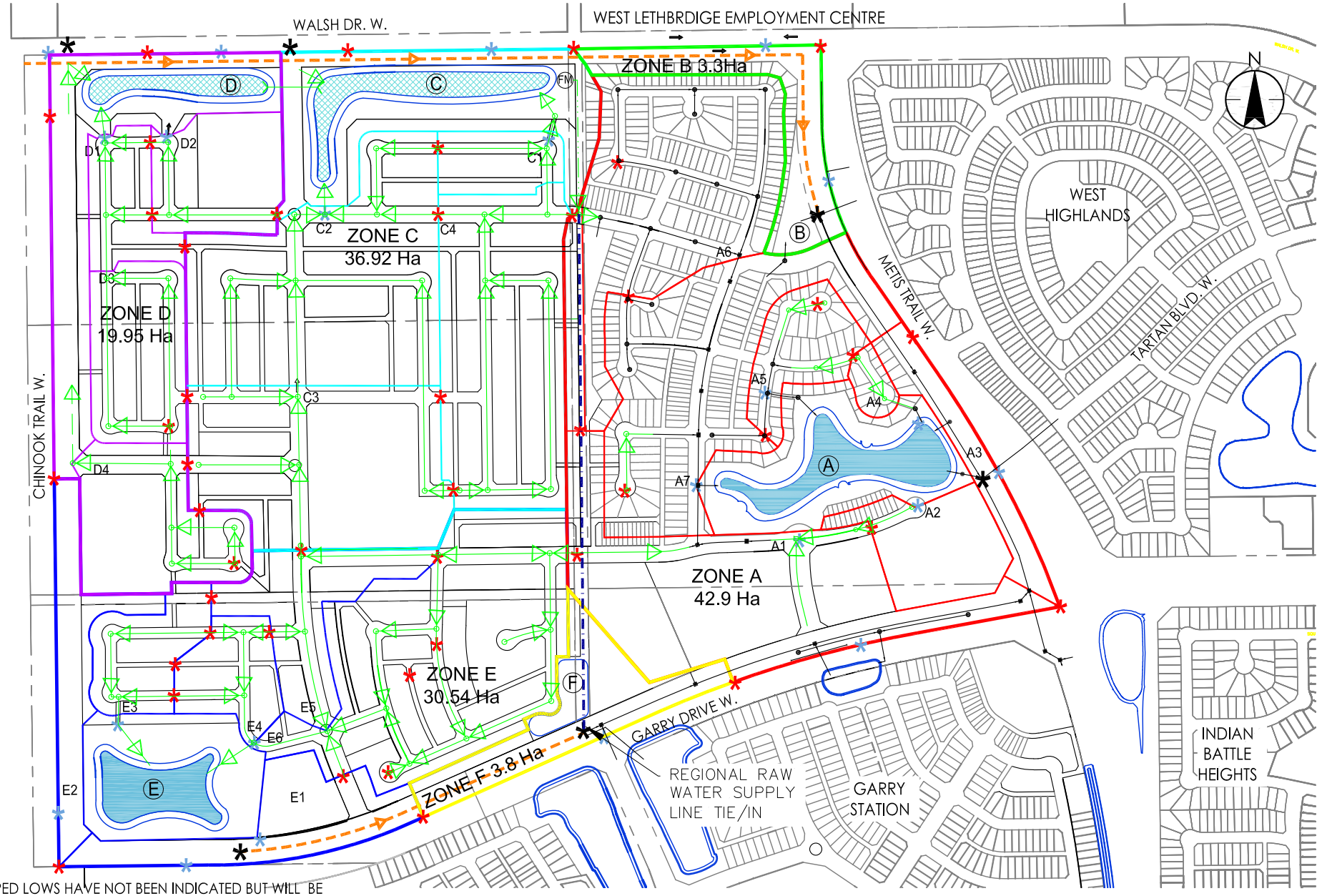
V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 11.1A_storm water management -major_20171120.dwg

COUNTRY MEADOWS OUTLINE | FIGURE 11.1A

Storm Water Management Major System

Outline Plan Amendment

PREPARED FOR: BW2 WEST & 2017836 ALBERTA LTD.



NOTE: TRAPPED LOWS HAVE NOT BEEN INDICATED BUT WILL BE INCORPORATED AT STRATEGIC LOCATIONS DURING DETAILED DESIGN.

NTS

Stantec

112948065
February 6, 2019

Legend

- Overland Flow Direction
- High Point
- Low Point
- (E) Pond Identification
- Sewer Connection Points
- Future Storm Trunk
- Future Storm Sewer and Flow Direction
- Existing Storm Sewer and Flow Direction
- (FM) Storm Water Lift Station
- Storm Forcemain
- Pond Make-up Water Supply Line

COUNTRY MEADOWS OUTLINE | FIGURE 11.1B

Storm Water Management Minor System

Outline Plan Amendment

PREPARED FOR: BW2 WEST & 2017836 ALBERTA LTD.

V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 11.1B_storm water management - minor_20181211.dwg

11.2 SANITARY SERVICING

11.2.1 Background Information

Previous planning documents have indicated that substantial upgrades or new installations will be required to the sanitary sewer collection system on the City of Lethbridge's West Side in order to provide adequate service to future developments. It is understood that the City will construct a new sanitary sewer trunk line through the Bridge Drive Utility Corridor that will be installed along Walsh Drive, Metis Trail and Garry Drive. The proposed sewer trunk in Metis Trail will match the existing 600mm diameter sewer that extends west of West Highlands along the projection of Tartan Boulevard.

Initially, the Outline Plan area will be provided sanitary sewer service by connecting to the existing sanitary sewer trunk extending into Metis Trail from Tartan Boulevard. This connection will allow the first phase of development to proceed. Upon completion of the Bridge Drive Utility Corridor a total of 60 ha of development shared between the Country Meadows and Garry Station plan areas can be served through the Tartan Boulevard trunk. Ultimately, capacity will be provided through a new sanitary sewer trunk running east along Walsh Drive and north along Metis Trail. The ultimate servicing trunks will be constructed as required to meet development demand.

The Country Meadows ASP indicates that a 1200mm diameter sewer trunk will be extended from Walsh Drive along Metis Trail and that a 450mm diameter sewer trunk will be installed along Garry Drive as part of the City's long range Capital Improvement Plan.

11.2.2 Design Standards

City of Lethbridge Design Standards for residential flows has been used for analysis.

Dry Weather Flow:	500L/cap/day
Wet Weather Flow:	400L/cap/day
Infiltration:	150L/cap/day
Harmon's Peaking Factor:	$[14/ (4+\sqrt{P})] +1$

11.2.3 SANITARY SERVICING

The sanitary servicing strategy remains largely unchanged aside from the additional residential development. The revised population statistics for Country Meadows indicate a total residential population of 5427 people. The revised sanitary sewage flow estimates have been identified by sewershed in Table 3 below. A total peak sewage flow of 119L/s was identified in 2012, and this total flow has increased to 122L/s based on new population. Based on the as-built sewer trunk exiting Country Meadows at Metis Trail (Ø400 @ 0.4%), the system has a capacity of 132L/s which is sufficient for the servicing of Sewershed A. Sewershed B will be serviced in the future by a sewer extension along Garry Drive west of 30th Street.

Figure 11.2 Sanitary Servicing & Connection Points has been updated to reflect the proposed amendment.

Table 3-Sanitary Sewage Flow Estimates by Sewershed

Sewershed	Gross Area (ha)	Population	Peak Flow (L/s)
A	99.1	4427	100
B	22.3	1000	22

11.3 WATER SERVICING

11.3.1 Background Information

The servicing of Country Meadows, from the perspective of potable water, will be ultimately supported by the development of a Treated Water Reservoir/Pumping Station that will be located on the north side of Garry Drive within the Country Meadows Outline Plan Boundary. Construction of this reservoir is currently underway.

The development will be flanked by major transmission lines--specifically a future 600mm diameter water line in Garry Drive and the existing 400mm diameter water line located in the future Metis Trail. In the future, water transmission lines will extend along Walsh Drive and Chinook Trail as well.

11.3.2 Design Standards

The following acceptable delivery pressures are stated in the 2009 City of Lethbridge Design Standards, *Level of Service Objectives*:

- No less than 310 kPa (45 psi) during peak hour demand
- No less than 345 kPa (50 psi) at maximum day demand
- Maximum delivery pressure will not exceed 620 kPa (90 psi)

The water system must also be able to supply adequate flow to hydrants. A minimum of 75 L/s with a minimum residual pressure of 150 kPa must be maintained during maximum day demand. Specific land uses and structures may require higher fire flows. The distribution system must be able to meet the requirements described in "Water Supply for Fire Protection" published by Fire Underwriters Survey.

11.3.3 WATER SERVICING

The water servicing strategy remains largely unchanged aside from the additional water demand on the system due to the additional residential development. Table 4 below identifies the revised estimated water demands.

Figure 11.3 Water Servicing & Connection Points has been updated to reflect the proposed amendment.

Table 4: Estimated Water Demands

Average Day Demand (415L/cap/day)	2.26 ML/day
Maximum Day Demand (2.2 x ADD*)	4.97 ML/day
Peak Hour (3.5 x ADD)	7.91 ML/day

*ADD – Average Day Demand

*Note: Water Usage based on an estimated population from Land Use Statistics.

11.4 SHALLOW UTILITIES

11.4.1 Existing Infrastructure

ATCO PIPELINES

ATCO Pipelines has been contacted with regard to the integration and/or relocation of their existing high pressure lines in the Country Meadows Area. Discussions between the Developer, ATCO Pipelines and the City of Lethbridge will be continued during the development of Country Meadows. At this time, it is proposed that Public Utility Corridors be established along the existing pipe alignments combined with pathways. We wish to note that this proposal does not prevent future developer's from relocating the line through a

planning adjustment. ATCO has provided Stantec with their "ATCO Pipelines Guidelines Controlling Development and/or Landscaping of High Pressure Natural Gas Rights of Way" (enclosed). It is anticipated that the Developer/City of Lethbridge will submit plans to ATCO Pipelines during the Gate 3 design stage. ATCO's current easement widths must be maintained along with cover above the existing line. However, the addition of fill material above the line will be permitted to a height of 2m above the crown of the gas line. Minimum cover is 1.2m.

Correspondence with ATCO Pipelines indicates that an easement currently registered to Canadian Western Natural Gas on SW 34-8-22-4 has no corresponding infrastructure installed within it and has been discharged.

It is understood that City of Lethbridge Land Use Bylaws will govern the development of land beyond the gas line right of way (buildings shall be a minimum of 15.25m from the gas line).

ATCO GAS

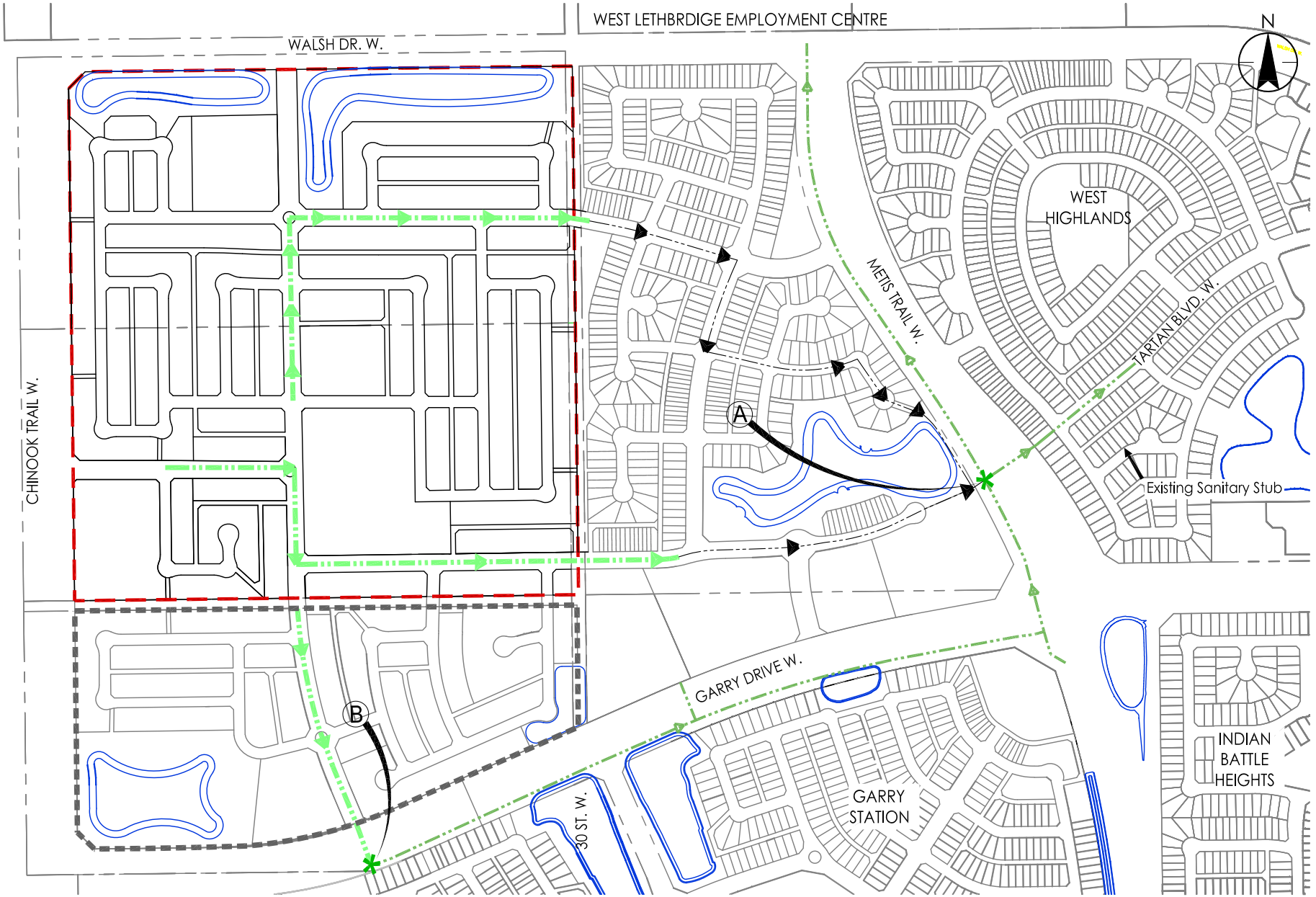
It is anticipated that the existing ATCO gas facilities will be relocated and integrated into the community at the subdivision detailed design stage.

TELUS

It is anticipated that the existing Telus facilities will be relocated and integrated into the community at the subdivision detailed design stage.

FORTIS

It is anticipated that the existing Fortis facilities will be relocated and integrated into the community at the subdivision detailed design stage by the City of Lethbridge and their Electrical Department.



NTS

Stantec

112948065
February 6, 2019

Legend

- Country Meadows Amendment Boundary
- Sewershed Boundary
- (A) Sewershed Label
- * Connection to Future Sewer Trunk
- Proposed Sewer Trunk
- Existing Sewer Trunk
- Perimeter Sewer Trunk

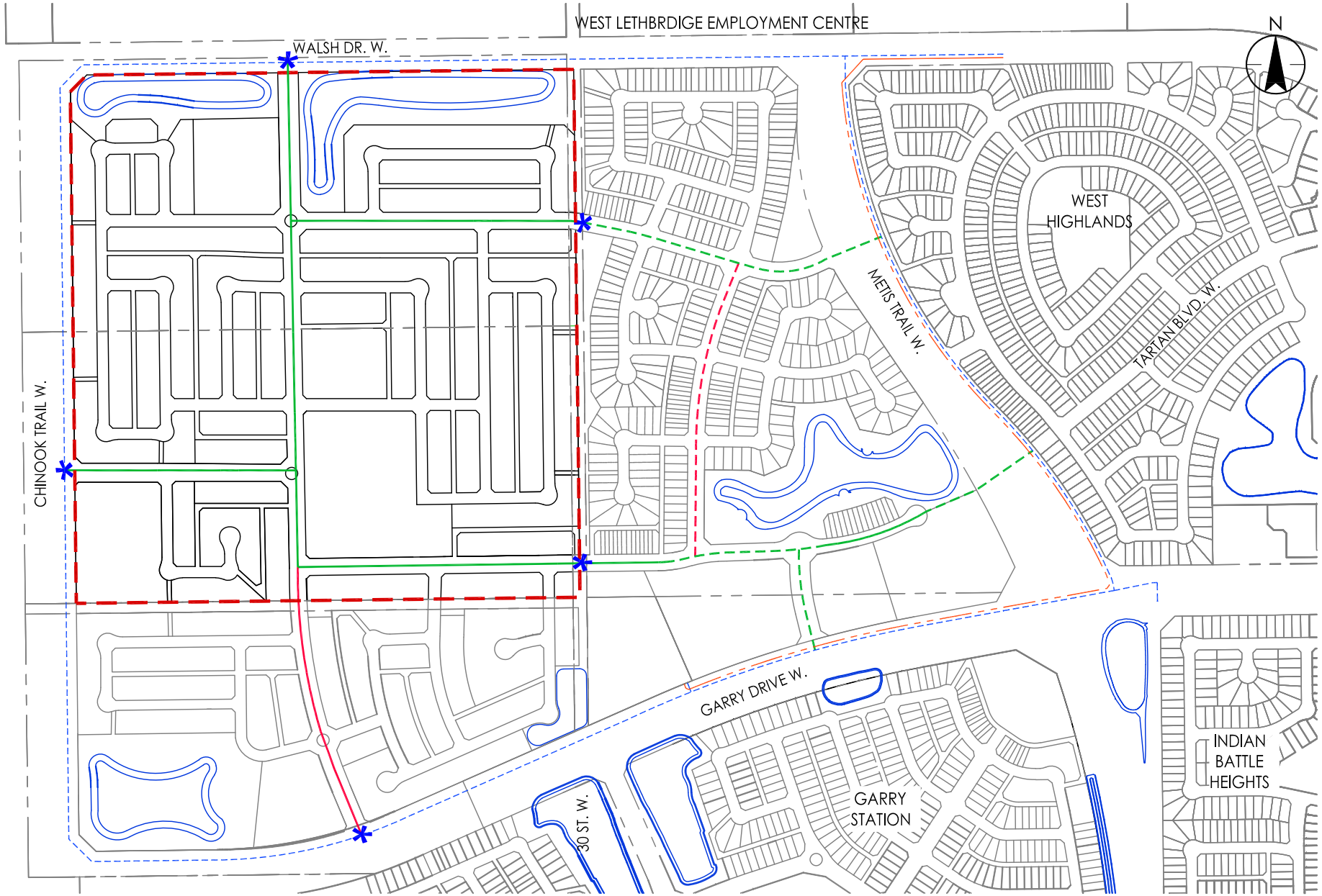
COUNTRY MEADOWS | FIGURE 11.2

Sanitary Servicing & Connection Points

Outline Plan Amendment

PREPARED FOR: BW2 WEST & 2014836 Alberta Ltd.

V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 11.2_sanitary servicing_20171120.dwg



NTS

Stantec

112948065
February 6, 2019

Legend

- Country Meadows Amendment Boundary
- Proposed 250Ø
- Proposed 300Ø
- Perimeter Water Distribution
- Reservoir Fill Line
- Connection to Future Water Trunk
- Existing 250Ø
- Existing 300Ø

COUNTRY MEADOWS | FIGURE 11.3

Water Servicing & Connection Points

Outline Plan Amendment

PREPARED FOR: BW2 WEST & 2014836 Alberta Ltd.

V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 11.3_water servicing_20171120.dwg

12 PROPOSED STAGING

Figure 12.1 Proposed Phasing has been renamed to ***Figure 12.1 Proposed Development Staging***. This change will give more flexibility to the developer at time of subdivision to adjust their phase size based on current market conditions. Staging will utilize the existing infrastructure, and the construction of critical new infrastructure including storm water management facilities, to provide logical extensions to the community. ***Table 12.1 Staging Requirements***

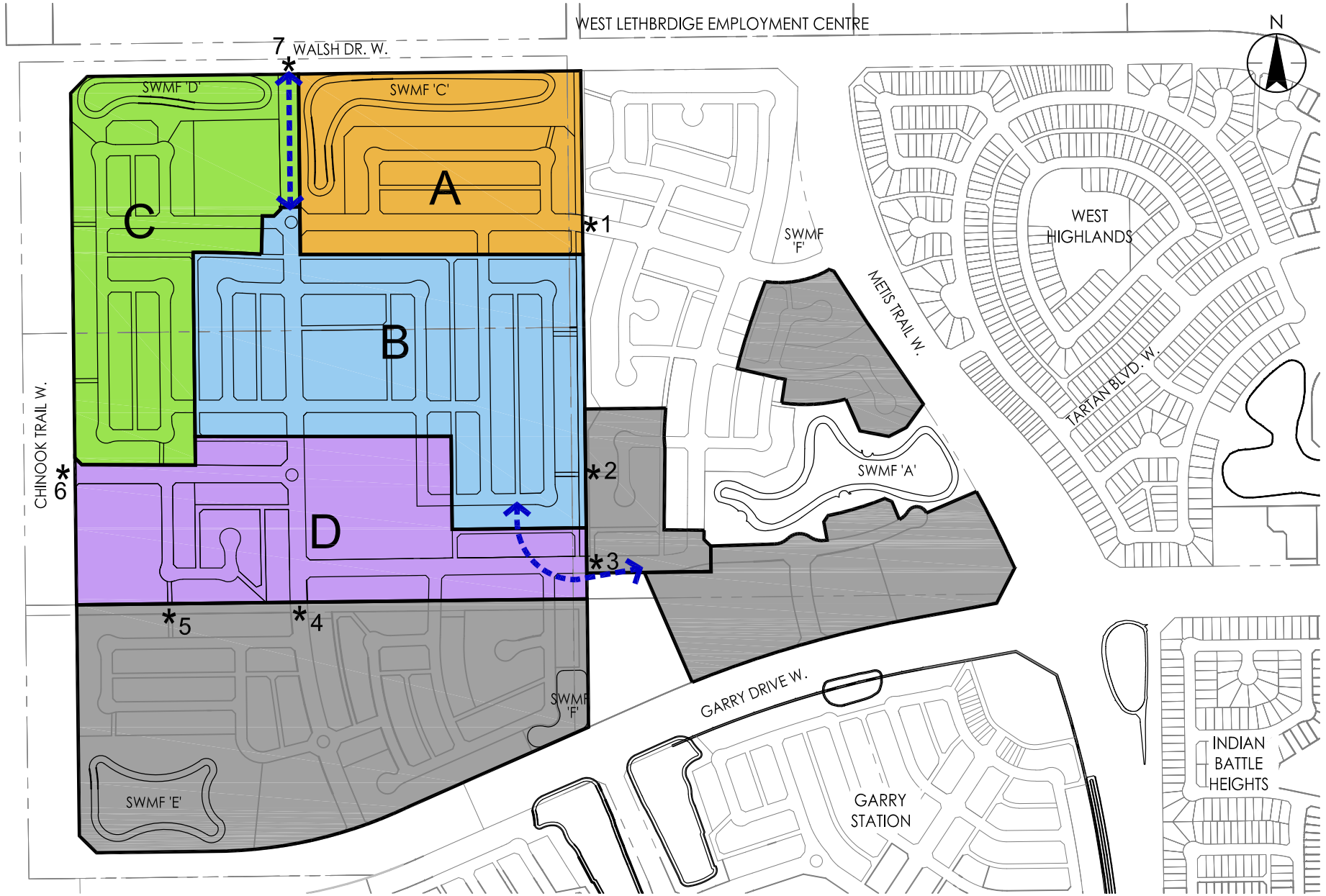
Table 12.1-Staging Requirements

Area	SWMF	Water	Sanitary	Transportation
A	C	1	1	1
B	A,C	1,2	1	1
C	D	1,2	1	1,7
D	A,C,D,[E,F]	1,2,3	1	1,3,7

At time of development, infrastructure looping and road accesses will be reviewed based on the most current City of Lethbridge Standards. Phased construction shall meet with current City guidelines with respect to Water Distribution, Sanitary and Storm Sewer Systems, and Storm Water Management Facilities. Offsite Infrastructure may be required to facilitate development, Ponds and pond outlets must be constructed concurrently with the first phase requiring the facility. All phases will be provided overland flow routes to the ponds.

School site development within Country Meadows would occur during the development of Stage D based on the logical extension of utility servicing from the north. Accelerated development of the school site would be at the discretion of the land owner and subject to the ability to bring electrical and storm water management infrastructure to the site.

Regarding secondary emergency services access, Areas A & B will require a secondary access at some point during subdivision phasing. Two options have been identified for a temporary secondary emergency access. The final location and design of this interim access will occur at subdivision and detailed design in consultation with City of Lethbridge Emergency Services.



NTS

Stantec

112948065
February 6, 2019

Legend

- Future Development Areas
- Service Area A
- Service Area B
- Service Area C
- Service Area D
- * Infrastructure Connection Points
- SWMF Storm Water Management Facility
- Secondary Emergency Access (To Be Confirmed During Detailed Design)

V:\1129\active\112948065\drawings\planning\sheet_files\olp_figures\48065_FIG 12.1_proposed staging_20171120.dwg

COUNTRY MEADOWS | FIGURE 12.1

Proposed Development Staging

Outline Plan Amendment

PREPARED FOR: BW2 WEST & 2014836 Alberta Ltd.

13 FIRE PROTECTION

Public roadways will be designed to meet the current City of Lethbridge Design Standards to ensure safe emergency vehicle passage.

The City of Lethbridge "Emergency Response Time Modeling" for Country Meadows will need to be reviewed at the time of subdivision in order to meet applicable provincial regulations. Refer to *Appendix H, High Intensity Fire Response Analysis City of Lethbridge*.

14 SUSTAINABILITY

Country Meadows has incorporated principles of sustainable design into the community. A variety of land use districts have been selected throughout the plan area to accommodate a mix of housing styles to address a wide range of market demographics. The land uses also provide opportunities to implement innovative design and creativity.

A comprehensive open space network achieves connectivity while creating a sense of place which promotes active and passive recreational opportunities as well as promoting alternative modes of transportation. The pedestrian and pathway network constructed of sustainable materials connects future residents with the amenities to the south. Bicycling friendly pathways and amenities will further enhance opportunities for neighbourhood socializing and interaction.

In the interest of sustainable development, high maintenance park areas have been minimized and xeriscaping principles will be used to create an aesthetic and functional open space network. Consideration of different lighting forms and power sources will be initiated as well as provisions for recycling sites. Building designs will also be explored to provide orientation for maximum feasible use of solar design and equipment.

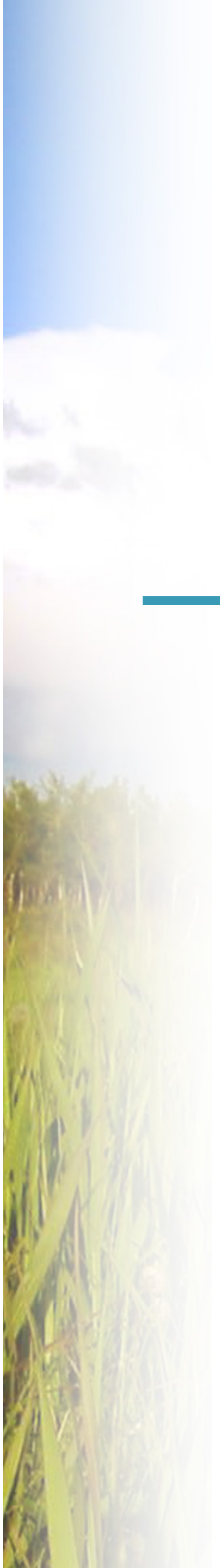
The layout of the community was strategically designed to minimize grading, including locating storm water management facilities in natural low areas. Storm Water Management Facilities will be utilized to irrigate open space areas along with make-up water from the Lethbridge Northern Irrigation District: Refer to *Appendix G: Lethbridge Northern Irrigation District Water Conveyance Letter.*

15 CONCLUSION

The Country Meadows Outline Plan Amendment continues to provide a logical extension to development in the communities of Garry Station, The Crossings and The Piers. The design of the Outline Plan conforms to the policies and intent of the Country Meadows Area Structure Plan. The Plan incorporates a variety of residential land uses providing the flexibility to incorporate innovative housing design and concepts. The extensive open space has created a community that offers modal choices to future residents.

Inspired by the early settlement of Western Canada, a new landscape of "country living" emerges to create a community representative of a pioneering spirit driven by family values. Here east meets west - where manicured two storey homes surrounded by white picket fences transition subtly with the introduction of the timber and fieldstone ranching lifestyle.

BW2 West & 2014836 Alberta Ltd respectfully requests OLP Amendment approval by the Municipal Planning Commission to accommodate the continued development of Country Meadows. Following MPC Approval, Land Use Bylaw Amendments and re-designations will be completed in the future at the discretion of the developer.



Appendix A

Certificate of Title

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0019 856 798	4;22;8;33;NE	161 073 829

LEGAL DESCRIPTION

MERIDIAN 4 RANGE 22 TOWNSHIP 8
SECTION 33
THE SOUTH HALF OF THE NORTH EAST QUARTER
CONTAINING 32.4 HECTARES (80 ACRES) MORE OR LESS
EXCEPTING THEREOUT ALL MINES AND MINERALS
AND THE RIGHT TO WORK THE SAME

ESTATE: FEE SIMPLE

MUNICIPALITY: CITY OF LETHBRIDGE

REFERENCE NUMBER: 051 183 050

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
161 073 829	23/03/2016	TRANSFER OF LAND	$4,000,000	$4,000,000

OWNERS

BW2 DEVELOPMENTS LTD.
OF 1111 3RD AVE SOUTH
LETHBRIDGE
ALBERTA T1J 0J5

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
751 003 319	14/01/1975	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED. "DISCHARGED EXCEPT AS TO PORTION DESCRIBED BY 761072087"
131 191 024	07/08/2013	CAVEAT

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
		RE : ACCESS CAVEATOR - SERVUS CREDIT UNION LTD. 480 SCENIC DRIVE S. LETHBRIDGE ALBERTA T1J4S3
161 073 830	23/03/2016	MORTGAGE MORTGAGEE - ALBERTA TREASURY BRANCHES. 601 MAYOR MAGRATH DRIVE SOUTH LETHBRIDGE ALBERTA T1J4M5 ORIGINAL PRINCIPAL AMOUNT: $12,000,000
161 073 831	23/03/2016	CAVEAT RE : ASSIGNMENT OF RENTS AND LEASES CAVEATOR - ALBERTA TREASURY BRANCHES. ATTENTION: DIRECTOR 601 MAYOR MAGRATH DRIVE SOUTH LETHBRIDGE ALBERTA T1J4M5 AGENT - NOLAN B JOHNSON
161 073 832	23/03/2016	CAVEAT RE : AGREEMENT CHARGING LAND CAVEATOR - ALBERTA TREASURY BRANCHES. ATTENTION: DIRECTOR 601 MAYOR MAGRATH DRIVE SOUTH LETHBRIDGE ALBERTA T1J4M5 AGENT - NOLAN B JOHNSON

TOTAL INSTRUMENTS: 005

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 5 DAY OF DECEMBER, 2017 AT 10:01 A.M.

ORDER NUMBER: 34180034

CUSTOMER FILE NUMBER:

END OF CERTIFICATE

(CONTINUED)

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LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0022 087 977	4;22;8;33;NE	171 051 016

LEGAL DESCRIPTION

MERIDIAN 4 RANGE 22 TOWNSHIP 8
SECTION 33
THE NORTH HALF OF THE NORTH EAST QUARTER
CONTAINING 32.4 HECTARES (80 ACRES) MORE OR LESS
EXCEPTING 1.03 ACRES FOR ROADWAY AS SHOWN ON PLAN 1618LK
EXCEPTING THEREOUT ALL MINES AND MINERALS
AND THE RIGHT TO WORK THE SAME

ESTATE: FEE SIMPLE

MUNICIPALITY: CITY OF LETHBRIDGE

REFERENCE NUMBER: 741 052 929

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
171 051 016	02/03/2017	TRANSFER OF LAND	$4,650,000	$4,650,000

OWNERS

2014836 ALBERTA LTD.
OF 11504-170 STREET
EDMONTON
ALBERTA T5S 1J7

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
741 052 928	03/06/1974	CAVEAT CAVEATOR - THE OLDMAN RIVER REGIONAL PLANNING COMMISSION.
751 003 057	14/01/1975	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
		LIMITED. "DISCHARGED AS TO 20' STRIPS IN NE 1/4 BY INST 761072085"
171 018 001	19/01/2017	CAVEAT RE : VENDOR'S LIEN CAVEATOR - MARLENE M BROWN CAVEATOR - CLIFFORD R BROWN BOTH OF: C/O SHIM LAW 201, 1100 - 8TH AVENUE SW CALGARY ALBERTA T2P3T8
171 051 017	02/03/2017	MORTGAGE MORTGAGEE - MARLENE M BROWN MORTGAGEE - CLIFFORD R BROWN BOTH OF: 310-30 STREET W LETHBRIDGE ALBERTA T1J4S6 ORIGINAL PRINCIPAL AMOUNT: $3,900,000
171 164 868	25/07/2017	CAVEAT RE : BENEFICIAL OWNER CAVEATOR - DAYTONA LAND COUNTRY MEADOWS LTD. C/O MISHNA BRIERE & OEHM LLP 11524 170 ST NW EDMONTON ALBERTA T5S1J7 AGENT - MICHAEL L OEHM

TOTAL INSTRUMENTS: 005

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 23 DAY OF NOVEMBER, 2017 AT 02:34 P.M.

ORDER NUMBER: 34129273

CUSTOMER FILE NUMBER:

END OF CERTIFICATE

(CONTINUED)

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LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0035 075 507	4;22;8;33;SE	121 002 636 +1

LEGAL DESCRIPTION

MERIDIAN 4 RANGE 22 TOWNSHIP 8
THE NORTH HALF OF THE SOUTH EAST
QUARTER OF SECTION 33
CONTAINING 32.4 HECTARES (80 ACRES) MORE OR LESS
EXCEPTING THEREOUT:

PLAN	NUMBER	HECTARES	ACRES	MORE OR LESS
SUBDIVISION	1210033	3.01	7.44	

EXCEPTING THEREOUT ALL MINES AND MINERALS

ESTATE: FEE SIMPLE

MUNICIPALITY: CITY OF LETHBRIDGE

REFERENCE NUMBER: 061 218 951

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
121 002 636	04/01/2012	SUBDIVISION PLAN		

OWNERS

DEBRA L DUDLEY-OLAFSON
OF BOX 511
LETHBRIDGE
ALBERTA T1J 3Z4

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
751 006 966	27/01/1975	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED. "DISCHARGED EXCEPT AS TO A 20 FOOT STRIP SEE INSTRUMENT 761072088"

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
		(DATA UPDATED BY: 131020588)
981 066 289	04/03/1998	CAVEAT RE : RIGHT OF WAY AGREEMENT CAVEATOR - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED. 909 - 11 AVENUE,S.W. CALGARY ALBERTA T2R1L8 (DATA UPDATED BY: TRANSFER OF CAVEAT 981078661)
101 310 658	21/10/2010	MORTGAGE MORTGAGEE - CANADIAN IMPERIAL BANK OF COMMERCE. 701 - 4 AVENUE SOUTH, LETHBRIDGE ALBERTA T1J4A5 ORIGINAL PRINCIPAL AMOUNT: $500,000
121 002 635	04/01/2012	CAVEAT RE : DEFERRED RESERVE CAVEATOR - THE CITY OF LETHBRIDGE. 910 - 4TH AVE. SOUTH, LETHBRIDGE ALBERTA AGENT - MAUREEN GAEHRING.
151 303 969	24/11/2015	DISCHARGE OF CAVEAT 981066289 PARTIAL EXCEPT PLAN/PORTION: 9812070
161 168 031	20/07/2016	UTILITY RIGHT OF WAY GRANTEE - THE CITY OF LETHBRIDGE. AS TO PORTION OR PLAN:1611776

TOTAL INSTRUMENTS: 006

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 23 DAY OF NOVEMBER, 2017 AT 02:34 P.M.

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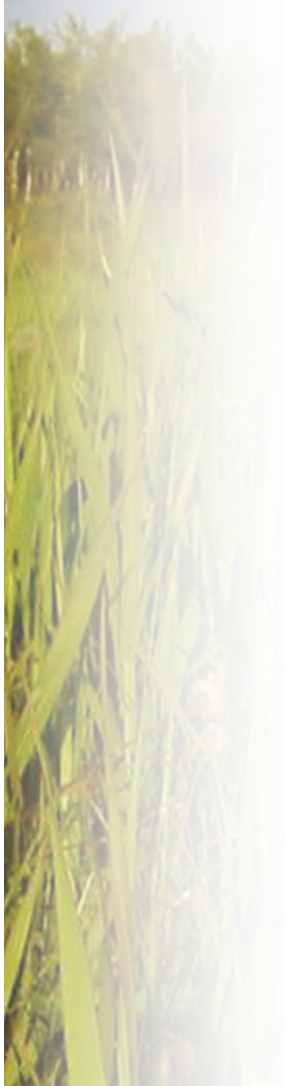


Appendix B

TIA Amendment Memo

Stantec

Memo

To:	Adam St. Amant City of Lethbridge	From:	Angela Forsyth Lethbridge Office
File:	112948170 112948065	Date:	January 24, 2019

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment

Background

Stantec was retained by BW2 West & 2014836 Alberta Ltd to prepare a revised transportation impact assessment associated with a land use re-designation and reconfiguration of a portion of internal roadway network within the Country Meadows development. Country Meadows is generally located south of Walsh Drive West, east of the future Chinook Trail, west of Métis Trail, and north of Garry Drive West. The proposed changes include:

- Reducing the area of the school site.
- Relocation of north Modified Linear Parks.
- Relocation of north community entrance road.
- Addition of 137 low-density single-family dwelling units.
- Removal of 88 medium-density R75 dwelling units.

The cumulative changes result in a net increase of approximately 49 residential dwelling units. To support these density and access changes, the layout of the roadway network area has been revised to accommodate the plan changes. The revised plan is shown in **Figure 1**.

A revised trip generation and intersection analysis was conducted based on the proposed changes and is summarized in this memorandum. Analysis was conducted for both the Weekday AM Peak Hour and Weekday PM Peak Hour using the volumes from the approved TIA and revised site-generated traffic volumes and patterns estimated in this memorandum.

Trip Generation and Trip Distribution

Based on the proposed revisions, a net increase of approximately 137 low-density units and a net decrease of 88 medium-density residential units is anticipated. The associated trip generation for this land use revision is noted below in **Table 1**.

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment

Country Meadows Unit / Population Statistics By Owner		
Amendment Area		
BW2 WEST	Total Units	Area Population
Low Density (2.9 P/Unit)	351	1017
Medimum Density (1.9 P/Unit)	95	180
Swing Site (1.9 P/Unit)	169	321
Sub Total	615	1518
2014836 ALBERTA LTD.		
Low Density (2.9 P/Unit)	330	957
Swing Site (1.9 P/Unit)	133	253
Sub Total	463	1210
Total Amendment Area	1078	2728
Existing and Future Area		
SOUTHGATE COMMERCIAL LANDS		
Low Density (2.9 P/Unit)	306	887
Medimum Density (1.9 P/Unit)	401	761
Existing and Future Row Medium Density (1.9 P/Unit)	64	121
Sub Total	771	1769
DUDLEY-OLAFSON		
Low Density (2.9 P/Unit)	253	733
Medimum Density (1.9 P/Unit)	104	197
Sub Total	357	930
Total Existing/Future Area	1128	2699
Country Meadows Total	2206	5427
2012 OLP	2125	5103
Net increase(+)/ Decrease(-)	+ 81	+ 324

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment

Table 1: Trip Generation for Land Use Revision

Land Use	Intensity	AM			PM		
		Total Trips (vph)	In	Out	Total Trips (vph)	In	Out
Low Density Residential	Trip Generation Characteristics	0.77 trips/DU	26%	74%	1.02 trips/DU	64%	36%
	137 units	105	27	78	140	90	50
Medium Density Residential	Trip Generation Characteristics	0.75 trips/DU	29%	71%	0.92 trips/DU	61%	39%
	-88 units	-66	-19	-47	-81	-49	-32

Trip Distribution and Site-Generated Traffic Volumes

Figure 1.2 of the Country Meadows TIA illustrates the original study area's intersection numbers and is included as an attachment. The site-generated traffic volumes from Table 1 were added to the original site-generated and background traffic volumes within the amendment area and re-distributed to the internal and external intersections with consideration for the new internal road network. As the revised internal road network has been altered due to the land use revision, all intersections were analyzed as part of this revised TIA.

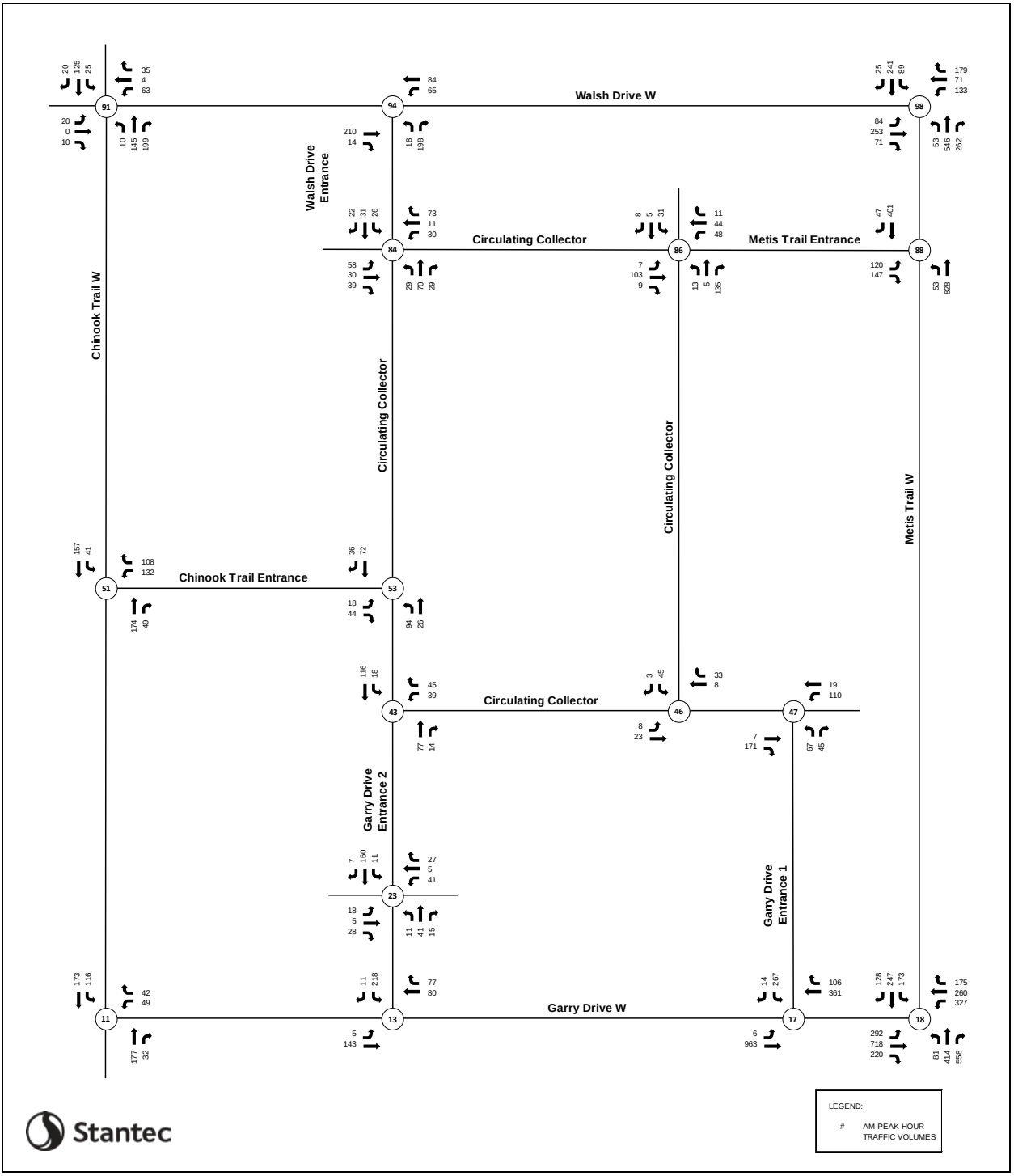
Post-Development Traffic Volumes

The site-generated volumes for the land use revision area were added to the full-build background traffic volumes and full-build site-generated traffic volumes illustrated in Figure 3.7, Figure 3.8, Figure 3.13 and Figure 3.14 of the Country Meadows TIA to develop revised full-build post-development AM Peak Hour and PM Peak Hour traffic volumes. The full-build post-development AM Peak Hour and PM Peak Hour volumes are illustrated in **Figure 3** and **Figure 4**, respectively. Volumes for the revised land use area were re-distributed over the new internal road network, which in effect altered the volumes on the external road network.

Intersection Analysis

Intersection analyses using the revised post-development AM Peak Hour and PM Peak Hour were conducted using Synchro and RODEL software packages. It should be noted that the previous intersection analyses conducted in the Country Meadows TIA used older versions of the Synchro software package and utilized the SIDRA software package for roundabouts. Therefore, analysis results will vary from the Country Meadows TIA due to volume differences as well as software types and versions. For consistency purposes, internal and external intersections analyzed as signalized intersections, stop-controlled intersections and roundabouts in the Country Meadows TIA were analyzed similarly in this analysis.

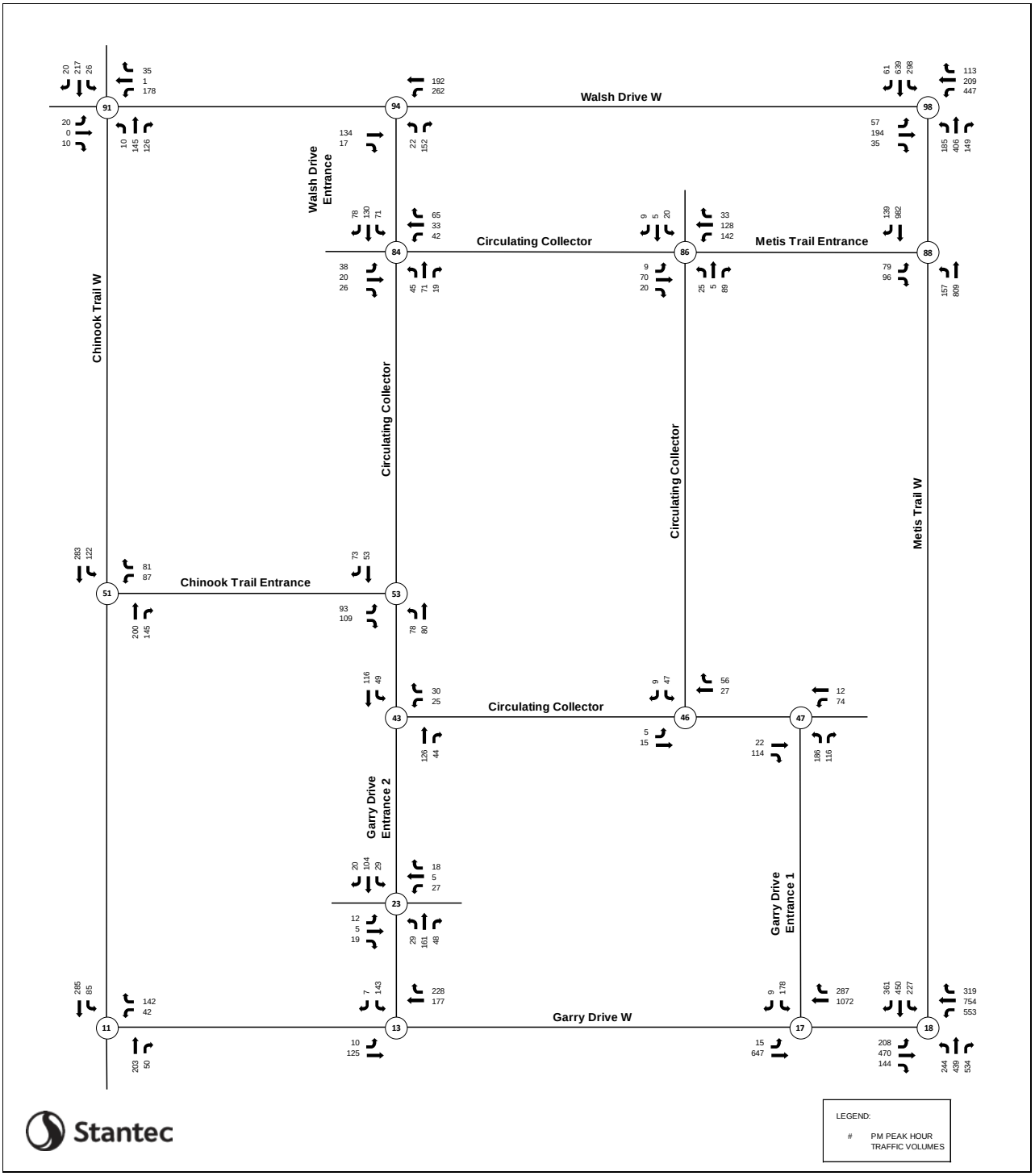
Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment



BW2 WEST / 2014836 Alberta Ltd.
COUNTRY MEADOWS
OUTLINE PLAN AMENDMENT

Figure 2
Revised Full-Build Post-Development Traffic Volumes
AM Peak Hour

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment



BW2 WEST / 2014836 Alberta Ltd.
COUNTRY MEADOWS
OUTLINE PLAN AMENDMENT

Figure 3
Revised Full-Build Post-Development Traffic Volumes
PM Peak Hour

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment

The intersection analysis for the internal intersections was undertaken using the Synchro 10 software package, which is based on the Highway Capacity Manual (HCM 2000). For unsignalized intersections, the methodology considers the intersection geometry, the traffic volumes, the posted speed limit and the type of intersection control. The average delay for each individual movement from the minor street, the major street left-turn movements and the overall intersection are calculated. An operation level of service (LOS) is then assigned based on the calculated average delay. For signalized intersections, the methodology considers the intersection geometry, the traffic volumes, the posted speed limit, the traffic signal phasing/timing plan as well as pedestrian volumes. The average delay for each lane group and the overall intersection are calculated. An operation LOS is then assigned based on the calculated average delay. The level of service criteria for both signalized and unsignalized intersections is described in **Table 2**.

The volume-to-capacity (v/c) ratio was also considered. If the v/c ratio for a movement is greater than 1.00, then that movement has technically exceeded capacity.

Table 2: Level of Service Criteria

Level of Service	Average Control Delay (seconds per vehicle)		Comment
	Signalized Intersection	Unsignalized Intersection	
A	10.0 or less	10.0 or less	Very good operation
B	10.1 to 20.0	10.1 to 15.0	Good operation
C	20.1 to 35.0	15.1 to 25.0	Acceptable operation
D	35.1 to 55.0	25.1 to 35.0	Congestion
E	55.1 to 80.0	35.1 to 50.0	Significant congestion
F	More than 80.0	More than 50.0	Unacceptable operation

Roundabout analysis was conducted using the RODEL software. When conducting the roundabout analysis, the LOS delay and v/c ratio estimates were conducted using HCM 2010.

The results of the post-development intersection analyses are summarized in **Table 3**. It should be noted that Intersection 46 has been altered to operates as a stop-condition in lieu of a roundabout. The results of the analysis indicate all study intersections are expected to operate at an acceptable LOS, v/c ratios and 95th Percentile Queues that are not expected to block adjacent intersections. Two intersections have been altered, as shown in **Figure 4**. The southbound to westbound bypass lane has been eliminated at the intersection of Walsh Drive and Métis Trail, while the right turn storage length on the southbound approach at Garry Drive and Métis Trail has been increased.

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment

Table 3: Revised Full-Build Horizon (2031) Post-Development Operating Conditions

Intersection	Intersection Control	Interval	Measure	Eastbound			Westbound			Northbound			Southbound			Level of Service
				Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
Garry Drive / Chinook Trail	Stop Control on Garry Drive	AM Peak Hour	Volumes (vph)				49		42		117	32	116	173		A
			Level of Service				B				A		A			
			V/C Ratio by Movement				0.217				-		0.101			
			95th Percentile Queue (veh)				0.8				-					
		PM Peak Hour	Volumes (vph)				42		142		203	50	85	285		B
			Level of Service				B				A		A			
			V/C Ratio by Movement				0.365				-		0.078			
			95th Percentile Queue (veh)				1.7				-		0.3			
Garry Drive / Metis Trail	Signals	AM Peak Hour	Volumes (vph)	292	718	220	327	260	175	81	414	558	173	247	128	C
			Level of Service	E	C	B	E	C	A	E	E	A	D	D	B	
			V/C Ratio by Movement	0.75	0.64	0.39	0.78	0.23	0.29	0.44	0.79	0.45	0.63	0.4	0.34	
			95th Percentile Queue (m)	52	110	42	58	37	15	19	70	0	35	45	23	
		PM Peak Hour	Volumes (vph)	208	470	144	553	754	319	244	439	534	227	450	361	D
			Level of Service	E	D	B	E	C	A	E	D	A	E	C	C	
			V/C Ratio by Movement	0.74	0.6	0.34	0.85	0.65	0.47	0.78	0.75	0.43	0.75	0.78	0.84	
			95th Percentile Queue (veh)	45	81	24	88	107	26	50	72	0	42	68	99	
Walsh Drive / Chinook Trail	Stop Control on Walsh Drive	AM Peak Hour	Volumes (vph)	20	0	10	63	4	35	10	145	199	25	125	20	A
			Level of Service	B			B			A			A			
			V/C Ratio by Movement	0.07			0.23			0.008			0.025			
			95th Percentile Queue (veh)	0.2			0.9			0			0.1			
		PM Peak Hour	Volumes (vph)	20	0	10	178	1	35	10	145	126	26	217	20	A
			Level of Service	B			C			A			A			
			V/C Ratio by Movement	0.077			0.574			0.009			0.024			
			95th Percentile Queue (veh)	0.2			3.5			0			0.1			
Walsh Drive / Metis Trail	Tw o-Lane Roundabout	AM Peak Hour	Volumes (vph)	84	253	71	133	71	179	53	546	262	89	241	25	A
			Level of Service	A			A			A			A			
			V/C Ratio by Movement	0.227			0.19			0.411			0.175			
			95th Percentile Queue (veh)	1.1			1.24			2.94			0.82			
		PM Peak Hour	Volumes (vph)	57	190	35	447	209	113	185	406	149	298	639	61	A
			Level of Service	A			A			A			A			
			V/C Ratio by Movement	0.179			0.473			0.448			0.499			
			95th Percentile Queue (veh)	0.83			4.87			3.43			4.26			
Garry Drive Entrance Road 1	Tw o-Lane Roundabout	AM Peak Hour	Volumes (vph)	6	963			361	106				267		14	A
			Level of Service	A				A					A			
			V/C Ratio by Movement	0.495				0.228					0.233			
			95th Percentile Queue (veh)	3.03				1.11					0.91			
		PM Peak Hour	Volumes (vph)	1072	287			15	647				178		9	A
			Level of Service	A				A					A			
			V/C Ratio by Movement	0.501				0.637					0.156			
			95th Percentile Queue (veh)	3.89				6.78					0.54			
Garry Drive Entrance Road 2	Stop Control on Entrance Road	AM Peak Hour	Volumes (vph)	5	143			80	77				218		11	A
			Level of Service	A				A					B			
			V/C Ratio by Movement	0.004				-					0.388			
			95th Percentile Queue (veh)	0				-					1.8			
		PM Peak Hour	Volumes (vph)	10	125			177	228				143		7	A
			Level of Service	A				A					C			
			V/C Ratio by Movement	0.011				-					0.327			
			95th Percentile Queue (veh)	0				-					1.4			
Chinook Trail Entrance Road	Stop Control on Entrance Road	AM Peak Hour	Volumes (vph)				132		108		174	49	41	157		A
			Level of Service				C				A		A			
			V/C Ratio by Movement				0.456				-		0.036			
			95th Percentile Queue (veh)				2.4				-		0.1			
		PM Peak Hour	Volumes (vph)				87		81		200	145	122	283		C
			Level of Service				D				A		A			
			V/C Ratio by Movement				0.52				-		0.122			
			95th Percentile Queue (veh)				2.9				-		0.4			
Walsh Drive Entrance Road	Stop Control on Entrance Road	AM Peak Hour	Volumes (vph)		210	14	65	84		18		198				A
			Level of Service		A		A				B					
			V/C Ratio by Movement		-		0.058				0.333					
			95th Percentile Queue (veh)		-		0.2				1.5					
		PM Peak Hour	Volumes (vph)		134	17	262	192		22		152				B
			Level of Service		A		A				B					
			V/C Ratio by Movement		-		0.217				0.323					
			95th Percentile Queue (veh)		-		0.8				1.4					
Metis Trail Entrance Road	Tw o-Lane Roundabout	AM Peak Hour	Volumes (vph)	120		147				53	828			401	47	A
			Level of Service	A						A				A		
			V/C Ratio by Movement	0.225						0.458				0.205		
			95th Percentile Queue (veh)	0.86						2.76				0.83		
		PM Peak Hour	Volumes (vph)	79		96				157	809			982	139	A
			Level of Service	A						B				A		
			V/C Ratio by Movement	0.152						0.698				0.505		
			95th Percentile Queue (veh)	0.53						11.44				3.43		
Intersection 23	Single Lane Roundabout	AM Peak Hour	Volumes (vph)	18	5	28	41	5	27	11	41	15	11	160	7	A
			Level of Service	A			A			A			A			
			V/C Ratio by Movement	0.044			0.066			0.057			0.146			
			95th Percentile Queue (veh)	0.14			0.21			0.18			0.51			
		PM Peak Hour	Volumes (vph)	12	5	19	27	5	18	29	161	48	29	104	20	A
			Level of Service	A			A			A			A			
			V/C Ratio by Movement	0.033			0.044			0.203			0.129			
			95th Percentile Queue (veh)	0.1			0.14			0.76			0.44			

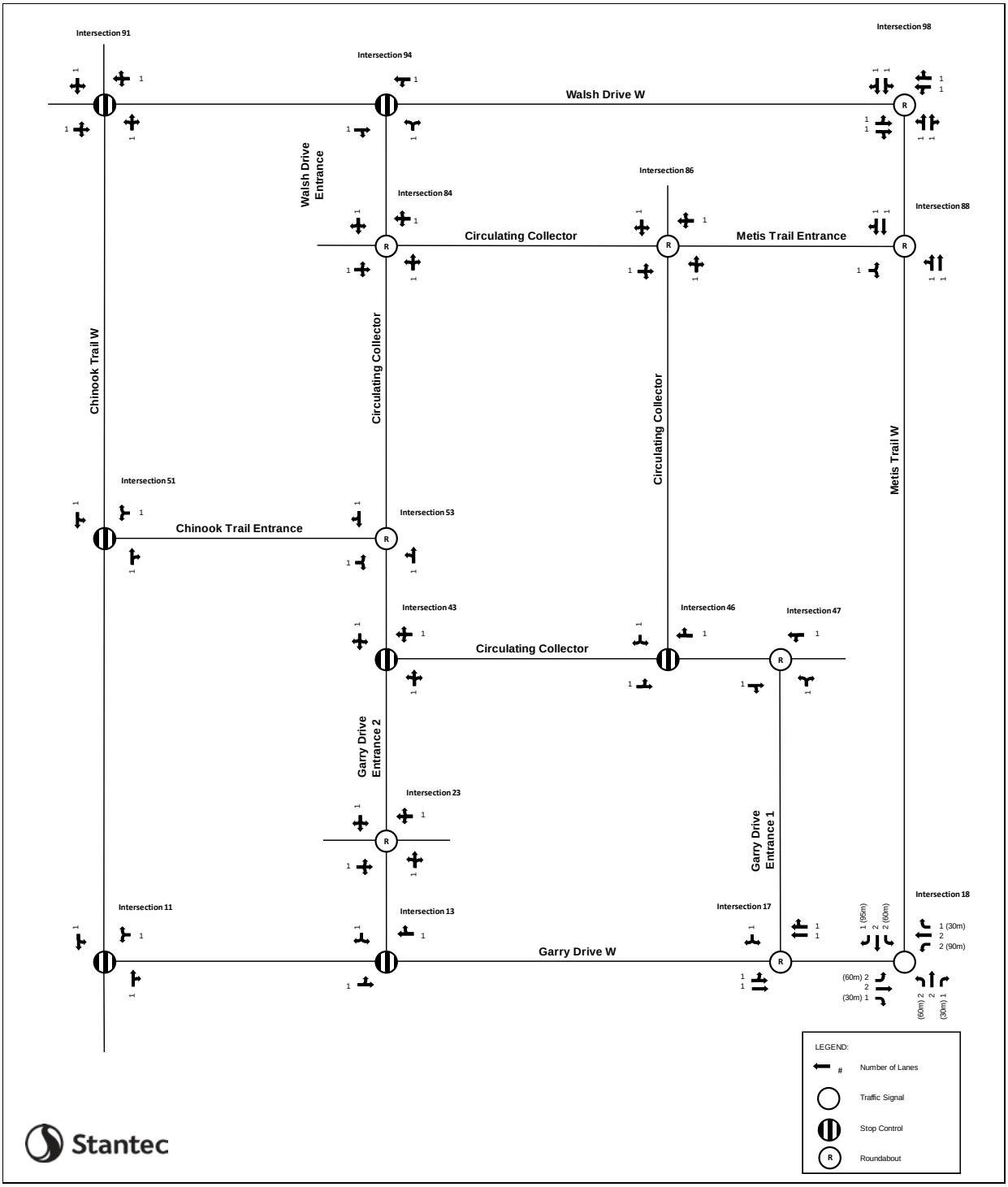
Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment

Intersection 46	Stop Control on Southbound Road	AM Peak Hour	Volumes (vph)	8	23			8	33				45		3	A
			Level of Service	A				A					A					
			V/C Ratio by Movement	0.006				-					0.059					
			95th Percentile Queue (veh)	0				-					0.2					
		PM Peak Hour	Volumes (vph)	5	15			27	56				47		9	A
			Level of Service	A				A					A					
			V/C Ratio by Movement	0.004				-					0.07					
			95th Percentile Queue (veh)	0				-					0.2					
Intersection 47	Single Lane Roundabout	AM Peak Hour	Volumes (vph)		7	171	110	19		67		45				A
			Level of Service		A		A			A								
			V/C Ratio by Movement		0.152		0.107			0.098								
			95th Percentile Queue (veh)		0.53		0.35			0.32								
		PM Peak Hour	Volumes (vph)		74	12	22	114		186		116				A
			Level of Service		A		A			A								
			V/C Ratio by Movement		0.123		0.072			0.259								
			95th Percentile Queue (veh)		0.42		0.23			1.05								
Intersection 53	Single Lane Roundabout	AM Peak Hour	Volumes (vph)	18		44				94	26			72	36	A
			Level of Service	A						A				A				
			V/C Ratio by Movement	0.054						0.103				0.09				
			95th Percentile Queue (veh)	0.17						0.34				0.29				
		PM Peak Hour	Volumes (vph)	93		109				78	80			53	73	A
			Level of Service	A						A				A				
			V/C Ratio by Movement	0.174						0.134				0.109				
			95th Percentile Queue (veh)	0.62						0.46				0.36				
Intersection 84	Single Lane Roundabout	AM Peak Hour	Volumes (vph)	58	30	39	30	11	73	29	70	29	26	31	22	A
			Level of Service	A			A			A			A					
			V/C Ratio by Movement	0.112			0.1			0.109			0.07					
			95th Percentile Queue (veh)	0.37			0.33			0.36			0.22					
		PM Peak Hour	Volumes (vph)	38	20	26	42	33	65	45	71	19	71	130	78	A
			Level of Service	A			A			A			A					
			V/C Ratio by Movement	0.075			0.13			0.12			0.242					
			95th Percentile Queue (veh)	0.24			0.45			0.4			0.96					
Intersection 86	Single Lane Roundabout	AM Peak Hour	Volumes (vph)	7	103	9	48	44	11	13	5	135	31	5	8	A
			Level of Service	A			A			A			A					
			V/C Ratio by Movement	0.102			0.087			0.134			0.039					
			95th Percentile Queue (veh)	0.33			0.28			0.46			0.12					
		PM Peak Hour	Volumes (vph)	9	70	20	142	128	33	25	5	89	20	5	9	A
			Level of Service	A			A			A			A					
			V/C Ratio by Movement	0.089			0.255			0.114			0.03					
			95th Percentile Queue (veh)	0.29			1.02			0.39			0.09					
Intersection 43	Stop Control on East Leg	AM Peak Hour	Volumes (vph)				39		45		77	14	18	116		A
			Level of Service				B				A		A					
			V/C Ratio by Movement				0.119				-		0.014					
			95th Percentile Queue (veh)				0.4				-		0					
		PM Peak Hour	Volumes (vph)				25		30		126	44	49	116		A
			Level of Service				B				A		A					
			V/C Ratio by Movement				0.091				-		0.041					
			95th Percentile Queue (veh)				0.3				-		0.1					

Roadway Classifications

As a result of the changes in roadway layout and traffic volumes, roadway classifications were re-visited to determine suitability for the amended conditions. Updated estimated internal daily traffic volumes are illustrated in **Figure 5**, while internal road network classifications are shown in **Figure 6**.

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment



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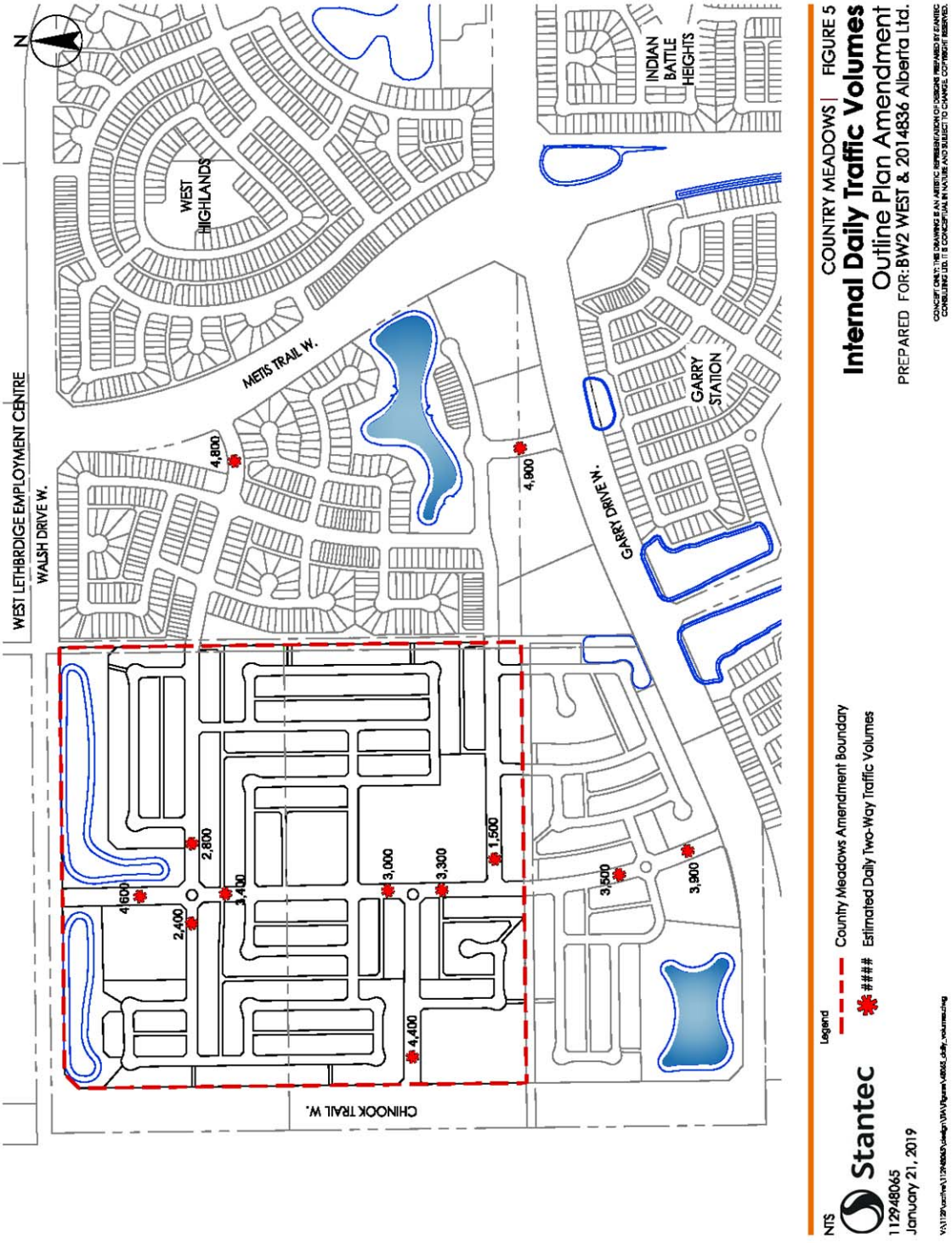
OUTLINE PLAN AMENDMENT

Figure 4
Revised Full-Build Post-Development Traffic Volumes
Recommended Lane Configurations

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment



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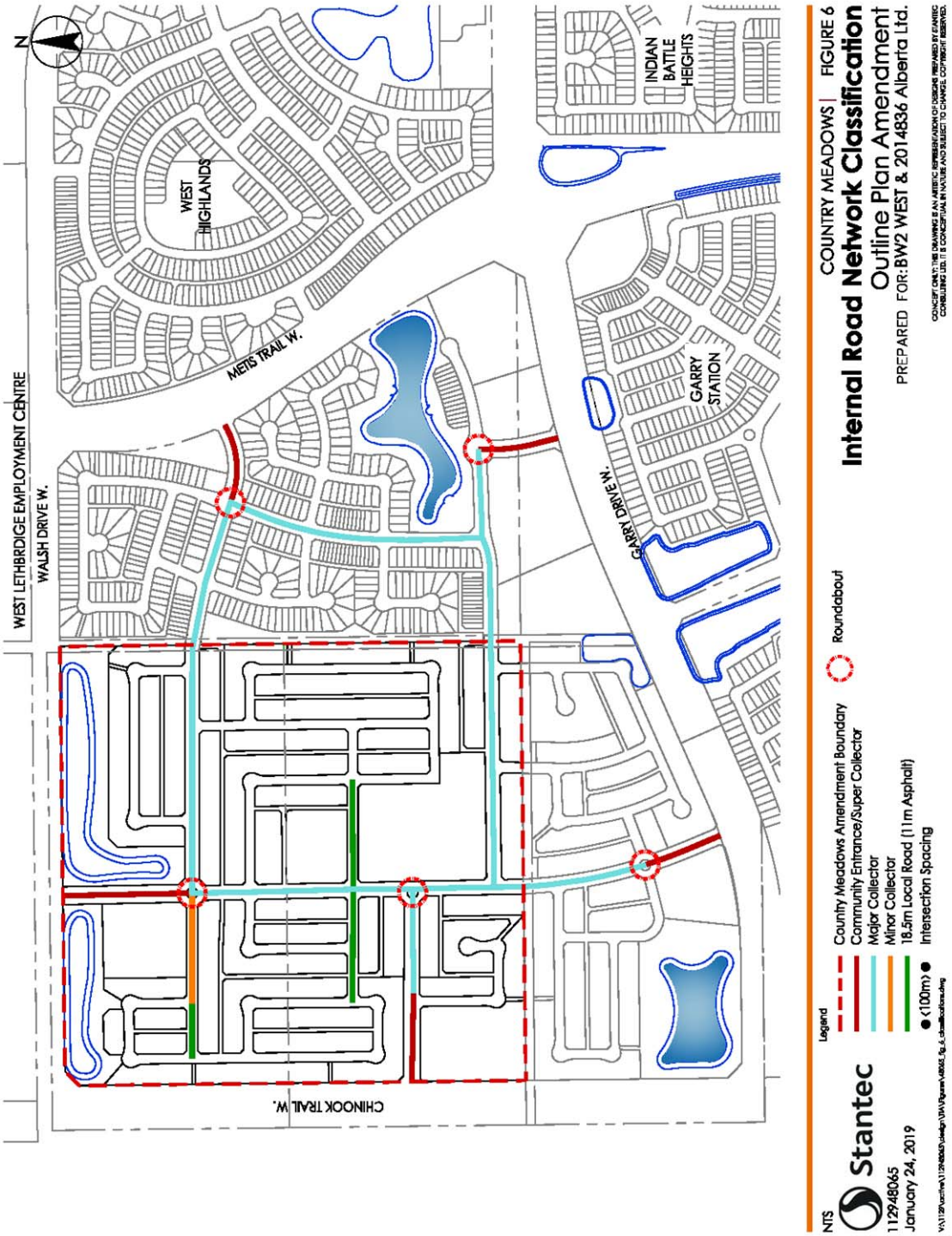


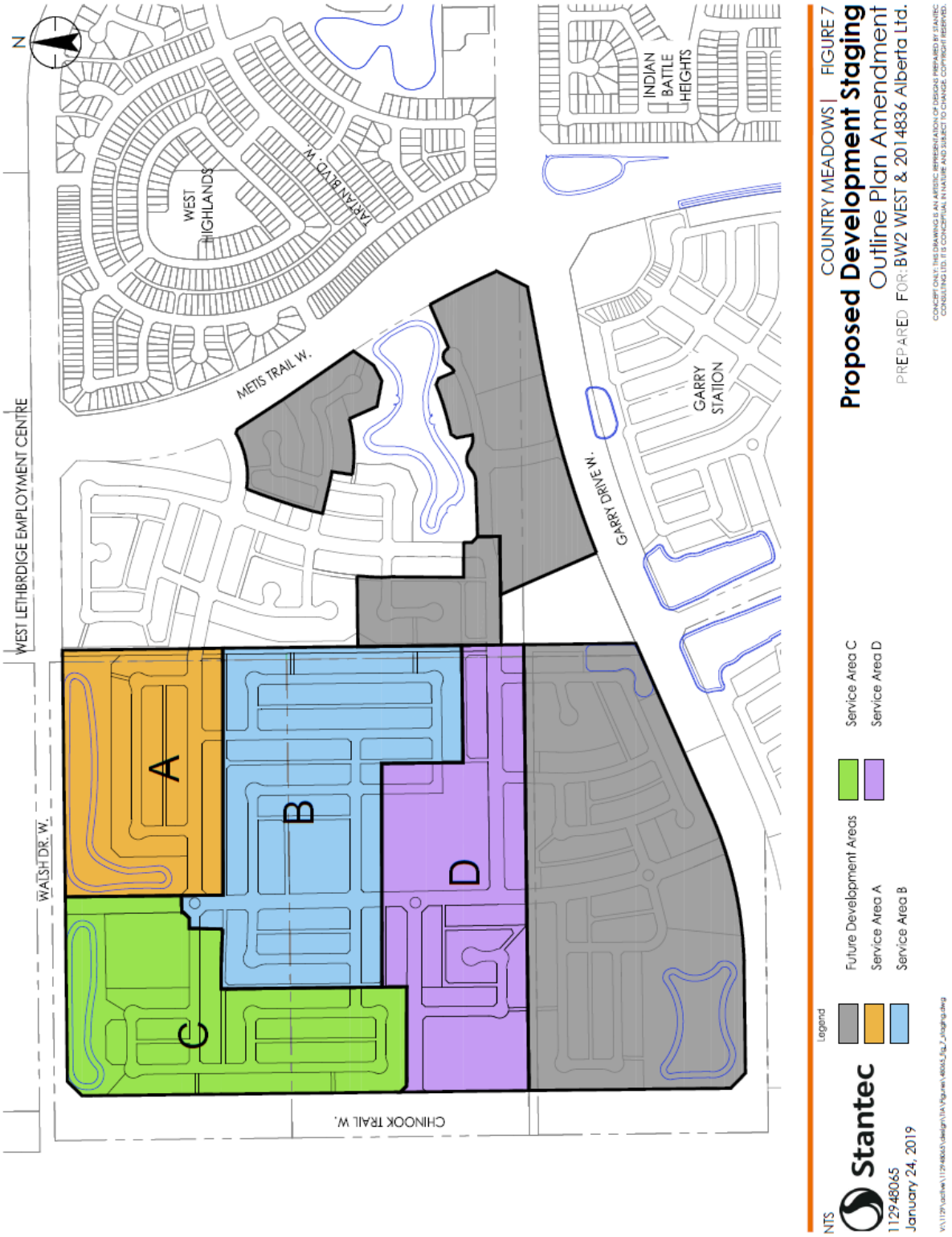
Entrance Road Staging

Estimated daily traffic volumes for each stage of construction were reviewed to assess the timing of construction for each additional access to the development. Currently, the only access road constructed is the Métis Trail access, with a current build-out of 263 single family dwelling units. A second access will need to be constructed upon opening Stages A, B and C, namely the Walsh Drive access point. These two accesses are anticipated to operate acceptably upon the opening of Stage D. **Table 4** outlines the dwelling units and estimated vehicle trips, while **Figure 7** depicts the stages of construction.

Table 4: Anticipated Access Requirements for Staging

Stage	Dwelling Units		Vehicle Trips Per Day	Capacity	Comment
	Single Family	Multi Family			
Existing	263	0	2,860	8,000	
Existing + A	383	0	3,900	8,000	
Existing + A + B	643	95	7,420	8,000	
Existing + A + B + C	816	228	10,400	8,000	Walsh Drive access required
Existing + A + B + C + D	930	397	13,110	16,000	

Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment



Reference: Country Meadows Outline Plan Amendment: Transportation Impact Assessment

Conclusions

The proposed land use revision is expected to result in and additional 137 low-density residential units and a decrease of 88 medium-density residential units within the Country Meadows community. The results of the transportation impact analysis indicate the additional units will have minimal impact to the anticipated operations of surrounding internal intersections and broader external intersections. With minor alterations, the intersection geometries and traffic control measures previously assumed as part of the Country Meadows TIA are expected to be adequate to accommodate the proposed land use revisions.

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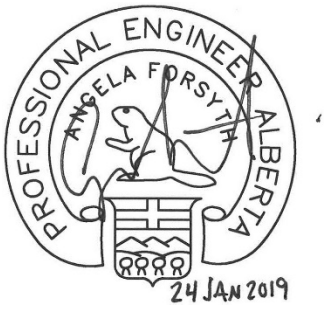

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Attachment: Synchro Outputs
Rodel Outputs

c. Brad Schmidtke, Stantec

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	42	177	32	116	173
Future Vol, veh/h	49	42	177	32	116	173
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	56	48	201	36	132	197

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	690	229	0	0	242	0
Stage 1	224	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	406	803	-	-	1307	-
Stage 1	806	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	355	794	-	-	1300	-
Mov Cap-2 Maneuver	355	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	621	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	3.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	477	1300	-
HCM Lane V/C Ratio	-	-	0.217	0.101	-
HCM Control Delay (s)	-	-	14.6	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.3	-

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	143	80	77	218	11
Future Vol, veh/h	5	143	80	77	218	11
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	2	2
Mvmt Flow	6	163	91	88	248	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	184	0	-	0	320	145
Stage 1	-	-	-	-	140	-
Stage 2	-	-	-	-	180	-
Critical Hdwy	4.15	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.245	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1373	-	-	-	673	902
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	851	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1365	-	-	-	662	892
Mov Cap-2 Maneuver	-	-	-	-	662	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	846	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1365	-	-	-	670
HCM Lane V/C Ratio	0.004	-	-	-	0.388
HCM Control Delay (s)	7.6	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.8

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Garry Drive Entrance 1	0	0	4.00	1	5.00	1	10.00	30.00	30.00
2	Garry Drive	90	0	7.00	2	8.50	2	20.00	30.00	30.00
3	Garry Drive	270	0	7.00	2	8.50	2	20.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Garry Drive Entrance 1	60.00	10.00	2	5.00	1	4.00	1
2	Garry Drive	60.00	5.00	1	10.00	2	7.00	2
3	Garry Drive	60.00	5.00	1	10.00	2	7.00	2

Operational Results

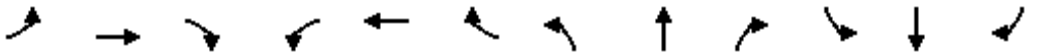
2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Garry Drive Entrance 1	None	281		6		1324	1205		0.2332	
2	Garry Drive	None	467		267		20	2053		0.2275	
3	Garry Drive	None	969		361		373	1959		0.4946	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Garry Drive Entrance 1	None	3.78		3.78	0.91		A		A
2	Garry Drive	None	2.75		2.75	1.11		A		A
3	Garry Drive	None	3.40		3.40	3.03		A		A

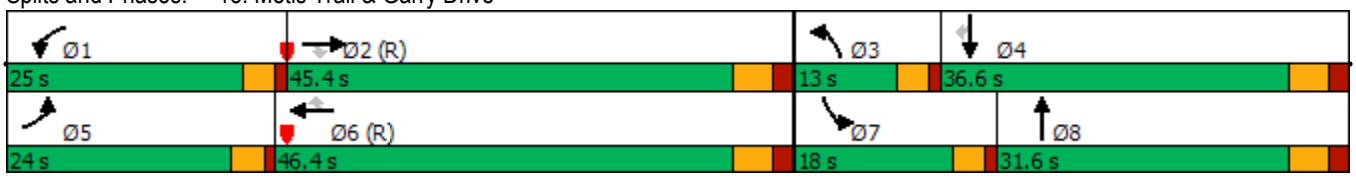


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	718	220	327	260	175	81	414	558	173	247	128
Future Volume (vph)	292	718	220	327	260	175	81	414	558	173	247	128
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	60.0		30.0	90.0		55.0	60.0		30.0	60.0		75.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98			0.98			0.99			0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3038	3202	1432	3038	3202	1432	3038	3202	1432	3038	3202	1432
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3038	3202	1404	3038	3202	1404	3038	3202	1413	3038	3202	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132			199			381			145
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		400.5			202.5			782.2			628.0	
Travel Time (s)		24.0			12.2			46.9			37.7	
Confl. Peds. (#/hr)			5			5			5			5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	332	816	250	372	295	199	92	470	634	197	281	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	332	816	250	372	295	199	92	470	634	197	281	145
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.13	1.10	1.10	1.13	1.10	1.10	1.13	1.10	1.10	1.13	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	8.0	4.0	4.0	8.0	4.0	4.0	8.0	4.0	4.0	8.0	4.0	4.0
Trailing Detector (m)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Detector 1 Position(m)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Detector 1 Size(m)	6.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			Free			4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	13.0	28.5	28.5	13.0	28.5	28.5	13.0	28.5		13.0	28.5	28.5
Total Split (s)	24.0	45.4	45.4	25.0	46.4	46.4	13.0	31.6		18.0	36.6	36.6
Total Split (%)	20.0%	37.8%	37.8%	20.8%	38.7%	38.7%	10.8%	26.3%		15.0%	30.5%	30.5%
Maximum Green (s)	20.0	39.9	39.9	21.0	40.9	40.9	9.0	26.1		14.0	31.1	31.1
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.5		4.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
Walk Time (s)		6.0	6.0		6.0	6.0		6.0			6.0	6.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0			17.0	17.0
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	17.6	47.5	47.5	18.9	48.8	48.8	8.3	22.2	120.0	12.4	26.3	26.3
Actuated g/C Ratio	0.15	0.40	0.40	0.16	0.41	0.41	0.07	0.18	1.00	0.10	0.22	0.22
v/c Ratio	0.75	0.64	0.39	0.78	0.23	0.29	0.44	0.79	0.45	0.63	0.40	0.34
Control Delay	59.8	34.0	15.5	60.1	25.6	5.0	60.2	56.8	1.0	53.4	47.4	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	34.0	15.5	60.1	25.6	5.0	60.2	56.8	1.0	53.4	47.4	18.4
LOS	E	C	B	E	C	A	E	E	A	D	D	B
Approach Delay		36.8			35.7			27.5			42.6	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	38.8	83.2	18.6	43.5	24.1	0.0	10.8	55.8	0.0	22.9	34.6	5.7
Queue Length 95th (m)	52.0	110.2	42.0	57.6	36.7	14.5	18.9	69.8	0.0	35.3	44.9	22.9
Internal Link Dist (m)		376.5			178.5			758.2			604.0	
Turn Bay Length (m)	60.0		30.0	90.0		55.0	60.0		30.0	60.0		75.0
Base Capacity (vph)	507	1266	635	535	1302	689	229	696	1413	356	829	471
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.64	0.39	0.70	0.23	0.29	0.40	0.68	0.45	0.55	0.34	0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 34.7		Intersection LOS: C	
Intersection Capacity Utilization 66.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 18: Metis Trail & Garry Drive



Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Garry Drive Entrance 2	0	0	4.50	1	5.00	1	10.00	30.00	30.00
2	Intersection 23 (East Leg)	90	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Garry Drive Entrance 2	180	0	4.00	1	5.00	1	10.00	30.00	30.00
4	Intersection 84 (West Leg)	270	0	4.50	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Garry Drive Entrance 2	40.00	5.00	1	5.00	1	4.50	1
2	Intersection 23 (East Leg)	40.00	5.00	1	5.00	1	4.00	1
3	Garry Drive Entrance 2	40.00	5.00	1	5.00	1	4.00	1
4	Intersection 84 (West Leg)	40.00	5.00	1	5.00	1	4.50	1

Operational Results

2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Garry Drive Entrance 2	None	174		34		110	1189		0.1463	
2	Intersection 23 (East Leg)	None	73		185		23	1106		0.0660	
3	Garry Drive Entrance 2	None	67		53		205	1178		0.0569	
4	Intersection 84 (West Leg)	None	51		93		27	1157		0.0441	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Garry Drive Entrance 2	None	3.45		3.45	0.51		A		A
2	Intersection 23 (East Leg)	None	3.40		3.40	0.21		A		A
3	Garry Drive Entrance 2	None	3.15		3.15	0.18		A		A
4	Intersection 84 (West Leg)	None	3.17		3.17	0.14		A		A

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	45	77	14	18	116
Future Vol, veh/h	39	45	77	14	18	116
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	51	88	16	20	132

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	278	106	0	0	109	0
Stage 1	101	-	-	-	-	-
Stage 2	177	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	712	948	-	-	1481	-
Stage 1	923	-	-	-	-	-
Stage 2	854	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	693	937	-	-	1473	-
Mov Cap-2 Maneuver	693	-	-	-	-	-
Stage 1	904	-	-	-	-	-
Stage 2	849	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	805	1473	-
HCM Lane V/C Ratio	-	-	0.119	0.014	-
HCM Control Delay (s)	-	-	10.1	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	23	8	33	45	3
Future Vol, veh/h	8	23	8	33	45	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	9	26	9	38	51	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	47	0	-	0	72	28
Stage 1	-	-	-	-	28	-
Stage 2	-	-	-	-	44	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1541	-	-	-	925	1039
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	971	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	919	1039
Mov Cap-2 Maneuver	-	-	-	-	919	-
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	971	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1541	-	-	-	926
HCM Lane V/C Ratio	0.006	-	-	-	0.059
HCM Control Delay (s)	7.3	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Intersection 47 (East Leg)	90	0	4.00	1	5.00	1	10.00	30.00	30.00
2	Garry Drive Entrance 1	180	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Intersection 47 (West Leg)	270	0	4.00	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Intersection 47 (East Leg)	40.00	5.00	1	5.00	1	4.00	1
2	Garry Drive Entrance 1	40.00	5.00	1	5.00	1	4.00	1
3	Intersection 47 (West Leg)	40.00	5.00	1	5.00	1	4.00	1

Operational Results

2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Intersection 47 (East Leg)	None	129		7		238	1203		0.1072	
2	Garry Drive Entrance 1	None	112		110		26	1147		0.0977	
3	Intersection 47 (West Leg)	None	178		67		155	1170		0.1521	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Intersection 47 (East Leg)	None	3.26		3.26	0.35		A		A
2	Garry Drive Entrance 1	None	3.39		3.39	0.32		A		A
3	Intersection 47 (West Leg)	None	3.53		3.53	0.53		A		A

Intersection	
Int Delay, s/veh	6.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	132	108	174	49	41	157
Future Vol, veh/h	132	108	174	49	41	157
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	5	5	5	5
Mvmt Flow	150	123	198	56	47	178

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	508	236	0	0	259	0
Stage 1	231	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.15	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.245	-
Pot Cap-1 Maneuver	525	803	-	-	1288	-
Stage 1	807	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	498	794	-	-	1281	-
Mov Cap-2 Maneuver	498	-	-	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	765	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	1.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	598	1281	-
HCM Lane V/C Ratio	-	-	0.456	0.036	-
HCM Control Delay (s)	-	-	16	7.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.4	0.1	-

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Circulating Collector (West Section)	0	0	4.00	1	5.00	1	10.00	30.00	30.00
2	Circulating Collector (West Section)	180	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Chinook Trail Entrance	270	0	4.00	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Circulating Collector (West Section)	40.00	5.00	1	5.00	1	4.00	1
2	Circulating Collector (West Section)	40.00	5.00	1	5.00	1	4.00	1
3	Chinook Trail Entrance	40.00	5.00	1	5.00	1	4.00	1

Operational Results

2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Circulating Collector (West Section)	None	108		18		138	1197		0.0902	
2	Circulating Collector (West Section)	None	120		72		54	1168		0.1028	
3	Chinook Trail Entrance	None	62		94		98	1156		0.0537	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Circulating Collector (West Section)	None	3.22		3.22	0.29		A		A
2	Circulating Collector (West Section)	None	3.34		3.34	0.34		A		A
3	Chinook Trail Entrance	None	3.21		3.21	0.17		A		A

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Walsh Drive Entrance	0	0	4.50	1	5.00	1	10.00	30.00	30.00
2	Circulating Collector (North Section)	90	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Circulating Collector (West Section)	180	0	4.00	1	5.00	1	10.00	30.00	30.00
4	Intersection 84 (West Leg)	270	0	4.50	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Walsh Drive Entrance	40.00	5.00	1	5.00	1	4.50	1
2	Circulating Collector (North Section)	40.00	5.00	1	5.00	1	4.00	1
3	Circulating Collector (West Section)	40.00	5.00	1	5.00	1	4.00	1
4	Intersection 84 (West Leg)	40.00	5.00	1	5.00	1	4.50	1

Operational Results

2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Walsh Drive Entrance	None	79		117		139	1144		0.0691	
2	Circulating Collector (North Section)	None	114		115		81	1144		0.0996	
3	Circulating Collector (West Section)	None	128		67		162	1170		0.1094	
4	Intersection 84 (West Leg)	None	127		129		66	1137		0.1117	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Walsh Drive Entrance	None	3.29		3.29	0.22		A		A
2	Circulating Collector (North Section)	None	3.40		3.40	0.33		A		A
3	Circulating Collector (West Section)	None	3.36		3.36	0.36		A		A
4	Intersection 84 (West Leg)	None	3.47		3.47	0.37		A		A

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Intersection 86 (North Leg)	0	0	4.50	1	5.00	1	10.00	30.00	30.00
2	Metis Trail Entrance	90	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Circulating Collector (East Section)	180	0	4.00	1	5.00	1	10.00	30.00	30.00
4	Circulating Collector (Norht Section)	270	0	4.50	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Intersection 86 (North Leg)	40.00	5.00	1	5.00	1	4.50	1
2	Metis Trail Entrance	40.00	5.00	1	5.00	1	4.00	1
3	Circulating Collector (East Section)	40.00	5.00	1	5.00	1	4.00	1
4	Circulating Collector (Norht Section)	40.00	5.00	1	5.00	1	4.50	1

Operational Results

2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Intersection 86 (North Leg)	None	44		123		62	1140		0.0386	
2	Metis Trail Entrance	None	103		43		124	1183		0.0870	
3	Circulating Collector (East Section)	None	153		123		23	1140		0.1342	
4	Circulating Collector (Norht Section)	None	119		66		210	1171		0.1016	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Intersection 86 (North Leg)	None	3.20		3.20	0.12		A		A
2	Metis Trail Entrance	None	3.24		3.24	0.28		A		A
3	Circulating Collector (East Section)	None	3.55		3.55	0.46		A		A
4	Circulating Collector (Norht Section)	None	3.33		3.33	0.33		A		A

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Metis Trail	0	0	7.00	2	8.50	2	20.00	30.00	30.00
2	Metis Trail	180	0	7.00	2	8.50	2	20.00	30.00	30.00
3	Metis Trail Entrance	270	0	4.00	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Metis Trail	60.00	5.00	1	10.00	2	7.00	2
2	Metis Trail	60.00	5.00	1	10.00	2	7.00	2
3	Metis Trail Entrance	60.00	10.00	2	5.00	1	4.00	1

Operational Results

2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Metis Trail	None	448		120		200	2185		0.2050	
2	Metis Trail	None	881		401		167	1922		0.4584	
3	Metis Trail Entrance	None	267		53		1229	1188		0.2247	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Metis Trail	None	2.17		2.17	0.83		A		A
2	Metis Trail	None	3.43		3.43	2.76		A		A
3	Metis Trail Entrance	None	3.80		3.80	0.86		A		A

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	0	10	63	4	35	10	145	199	25	125	20
Future Vol, veh/h	20	0	10	63	4	35	10	145	199	25	125	20
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	23	0	11	72	5	40	11	165	226	28	142	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	543	633	164	525	531	288	170	0	0	396	0	0
Stage 1	215	215	-	305	305	-	-	-	-	-	-	-
Stage 2	328	418	-	220	226	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	446	393	873	458	450	744	1389	-	-	1146	-	-
Stage 1	780	719	-	698	657	-	-	-	-	-	-	-
Stage 2	679	585	-	776	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	402	374	863	434	428	736	1381	-	-	1140	-	-
Mov Cap-2 Maneuver	402	374	-	434	428	-	-	-	-	-	-	-
Stage 1	767	695	-	686	646	-	-	-	-	-	-	-
Stage 2	627	575	-	741	688	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	14.2	0.2	1.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1381	-	-	489	505	1140	-	-
HCM Lane V/C Ratio	0.008	-	-	0.07	0.23	0.025	-	-
HCM Control Delay (s)	7.6	0	-	12.9	14.2	8.2	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.9	0.1	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	14	65	84	18	198
Future Vol, veh/h	210	14	65	84	18	198
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	2	2
Mvmt Flow	239	16	74	95	20	225

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	260	0	500	257
Stage 1	-	-	-	-	252	-
Stage 2	-	-	-	-	248	-
Critical Hdwy	-	-	4.15	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.245	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1287	-	530	782
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	793	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1280	-	492	773
Mov Cap-2 Maneuver	-	-	-	-	492	-
Stage 1	-	-	-	-	737	-
Stage 2	-	-	-	-	788	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	738	-	-	1280	-
HCM Lane V/C Ratio	0.333	-	-	0.058	-
HCM Control Delay (s)	12.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.2	-

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Metis Trail	0	0	7.00	2	8.50	2	20.00	30.00	30.00
2	Walsh Drive	90	0	7.00	2	8.50	2	20.00	30.00	30.00
3	Metis Trail	180	0	7.00	2	8.50	2	20.00	30.00	30.00
4	Walsh Drive	270	0	7.00	2	8.50	2	20.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Metis Trail	60.00	10.00	2	8.50	2	7.00	2
2	Walsh Drive	60.00	10.00	2	8.50	2	7.00	2
3	Metis Trail	60.00	10.00	2	8.50	2	7.00	2
4	Walsh Drive	60.00	10.00	2	8.50	2	7.00	2

Operational Results

2031 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Metis Trail	None	355		390		750	2031		0.1748	
2	Walsh Drive	None	383		414		331	2015		0.1901	
3	Metis Trail	None	861		293		504	2096		0.4107	
4	Walsh Drive	None	408		732		422	1802		0.2265	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Metis Trail	None	2.70		2.70	0.82		A		A
2	Walsh Drive	None	3.88		3.88	1.27		A		A
3	Metis Trail	None	3.89		3.89	2.94		A		A
4	Walsh Drive	None	3.07		3.07	1.10		A		A

Intersection	
Int Delay, s/veh	4.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	142	203	50	85	285
Future Vol, veh/h	42	142	203	50	85	285
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	48	161	231	57	97	324

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	788	270	0	0	293	0
Stage 1	265	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	356	761	-	-	1252	-
Stage 1	772	-	-	-	-	-
Stage 2	589	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	318	752	-	-	1245	-
Mov Cap-2 Maneuver	318	-	-	-	-	-
Stage 1	695	-	-	-	-	-
Stage 2	585	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	573	1245	-
HCM Lane V/C Ratio	-	-	0.365	0.078	-
HCM Control Delay (s)	-	-	14.8	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.7	0.3	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	125	177	228	143	7
Future Vol, veh/h	10	125	177	228	143	7
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	2	2
Mvmt Flow	11	142	201	259	163	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	465	0	-	0	505	341
Stage 1	-	-	-	-	336	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	4.15	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.245	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1081	-	-	-	527	701
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	861	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1075	-	-	-	515	693
Mov Cap-2 Maneuver	-	-	-	-	515	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	856	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1075	-	-	-	521
HCM Lane V/C Ratio	0.011	-	-	-	0.327
HCM Control Delay (s)	8.4	0	-	-	15.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Garry Drive Entrance 1	0	0	4.00	1	5.00	1	10.00	30.00	30.00
2	Garry Drive	90	0	7.00	2	8.50	2	20.00	30.00	30.00
3	Garry Drive	270	0	7.00	2	8.50	2	20.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Garry Drive Entrance 1	60.00	10.00	2	5.00	1	4.00	1
2	Garry Drive	60.00	5.00	1	10.00	2	7.00	2
3	Garry Drive	60.00	5.00	1	10.00	2	7.00	2

Operational Results

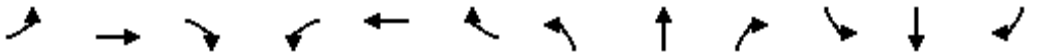
2031 PM Peak - 60 minutes

Flows and Capacity

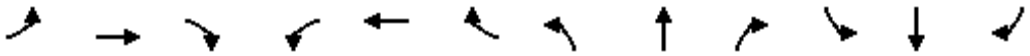
Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Garry Drive Entrance 1	None	187		15		1719	1202		0.1556	
2	Garry Drive	None	1359		178		24	2133		0.6371	
3	Garry Drive	None	662		1072		465	1301		0.5088	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Garry Drive Entrance 1	None	3.45		3.45	0.54		A		A
2	Garry Drive	None	5.39		5.39	6.78		A		A
3	Garry Drive	None	5.68		5.68	3.89		A		A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	470	144	553	754	319	244	439	534	227	450	361
Future Volume (vph)	208	470	144	553	754	319	244	439	534	227	450	361
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	60.0		30.0	90.0		55.0	60.0		30.0	60.0		75.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98			0.98			0.99			0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3038	3202	1432	3038	3202	1432	3038	3202	1432	3038	3202	1432
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3038	3202	1404	3038	3202	1404	3038	3202	1413	3038	3202	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132			321			343			233
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		379.0			226.3			790.4			606.3	
Travel Time (s)		22.7			13.6			47.4			36.4	
Confl. Peds. (#/hr)			5			5			5			5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	236	534	164	628	857	363	277	499	607	258	511	410
Shared Lane Traffic (%)												
Lane Group Flow (vph)	236	534	164	628	857	363	277	499	607	258	511	410
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.13	1.10	1.10	1.13	1.10	1.10	1.13	1.10	1.10	1.13	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	8.0	4.0	4.0	8.0	4.0	4.0	8.0	4.0	4.0	8.0	8.0	4.0
Trailing Detector (m)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Detector 1 Position(m)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Detector 1 Size(m)	6.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0	6.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			Free			4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												

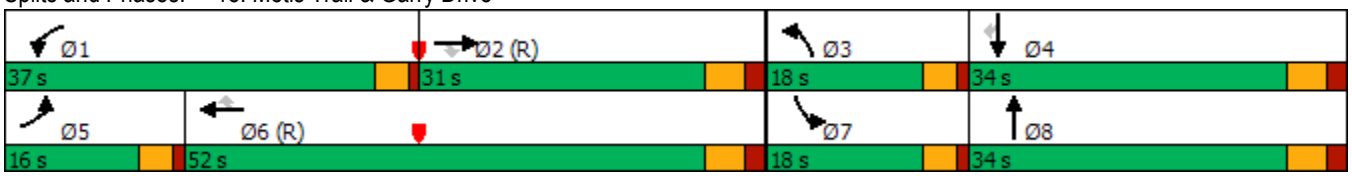


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	13.0	28.5	28.5	13.0	28.5	28.5	13.0	28.5		13.0	28.5	28.5
Total Split (s)	16.0	31.0	31.0	37.0	52.0	52.0	18.0	34.0		18.0	34.0	34.0
Total Split (%)	13.3%	25.8%	25.8%	30.8%	43.3%	43.3%	15.0%	28.3%		15.0%	28.3%	28.3%
Maximum Green (s)	12.0	25.5	25.5	33.0	46.5	46.5	14.0	28.5		14.0	28.5	28.5
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.5		4.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
Walk Time (s)		6.0	6.0		6.0	6.0		6.0			6.0	6.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0			17.0	17.0
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	12.5	33.2	33.2	29.1	49.7	49.7	14.1	25.1	120.0	13.7	24.6	24.6
Actuated g/C Ratio	0.10	0.28	0.28	0.24	0.41	0.41	0.12	0.21	1.00	0.11	0.20	0.20
v/c Ratio	0.74	0.60	0.34	0.85	0.65	0.47	0.78	0.75	0.43	0.75	0.78	0.87
Control Delay	67.2	43.1	12.6	55.2	31.8	6.6	66.8	51.6	1.0	61.3	33.8	33.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	43.1	12.6	55.2	31.8	6.6	66.8	51.6	1.0	61.3	33.8	33.2
LOS	E	D	B	E	C	A	E	D	A	E	C	C
Approach Delay		43.8			34.8			32.4			39.6	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	27.6	59.8	5.8	72.6	89.7	6.3	32.4	58.0	0.0	32.4	63.1	46.9
Queue Length 95th (m)	#44.7	80.7	23.8	88.0	107.0	26.1	#50.2	72.4	0.0	m42.4	m67.8	m99.5
Internal Link Dist (m)		355.0			202.3			766.4			582.3	
Turn Bay Length (m)	60.0		30.0	90.0		55.0	60.0		30.0	60.0		75.0
Base Capacity (vph)	323	884	483	835	1334	772	368	760	1413	362	760	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.60	0.34	0.75	0.64	0.47	0.75	0.66	0.43	0.71	0.67	0.80

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 36.8		Intersection LOS: D	
Intersection Capacity Utilization 74.1%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Metis Trail & Garry Drive



Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Garry Drive Entrance 2	0	0	4.50	1	5.00	1	10.00	30.00	30.00
2	Intersection 23 (East Leg)	90	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Garry Drive Entrance 2	180	0	4.00	1	5.00	1	10.00	30.00	30.00
4	Intersection 84 (West Leg)	270	0	4.50	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Garry Drive Entrance 2	40.00	5.00	1	5.00	1	4.50	1
2	Intersection 23 (East Leg)	40.00	5.00	1	5.00	1	4.00	1
3	Garry Drive Entrance 2	40.00	5.00	1	5.00	1	4.00	1
4	Intersection 84 (West Leg)	40.00	5.00	1	5.00	1	4.50	1

Operational Results

2031 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Garry Drive Entrance 2	None	153		46		207	1182		0.1294	
2	Intersection 23 (East Leg)	None	50		145		54	1128		0.0443	
3	Garry Drive Entrance 2	None	238		61		134	1174		0.2028	
4	Intersection 84 (West Leg)	None	36		217		82	1089		0.0331	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Garry Drive Entrance 2	None	3.40		3.40	0.44		A		A
2	Intersection 23 (East Leg)	None	3.25		3.25	0.14		A		A
3	Garry Drive Entrance 2	None	3.74		3.74	0.76		A		A
4	Intersection 84 (West Leg)	None	3.33		3.33	0.10		A		A

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	30	126	44	49	116
Future Vol, veh/h	25	30	126	44	49	116
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	34	143	50	56	132

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	422	178	0	0	198	0
Stage 1	173	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	588	865	-	-	1375	-
Stage 1	857	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	556	855	-	-	1367	-
Mov Cap-2 Maneuver	556	-	-	-	-	-
Stage 1	814	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	687	1367	-
HCM Lane V/C Ratio	-	-	0.091	0.041	-
HCM Control Delay (s)	-	-	10.8	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	15	27	56	47	9
Future Vol, veh/h	5	15	27	56	47	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	6	17	31	64	53	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	95	0	-	0	92	63
Stage 1	-	-	-	-	63	-
Stage 2	-	-	-	-	29	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1480	-	-	-	901	993
Stage 1	-	-	-	-	952	-
Stage 2	-	-	-	-	986	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1480	-	-	-	897	993
Mov Cap-2 Maneuver	-	-	-	-	897	-
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	986	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1480	-	-	-	911
HCM Lane V/C Ratio	0.004	-	-	-	0.07
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Intersection 47 (East Leg)	90	0	4.00	1	5.00	1	10.00	30.00	30.00
2	Garry Drive Entrance 1	180	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Intersection 47 (West Leg)	270	0	4.00	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Intersection 47 (East Leg)	40.00	5.00	1	5.00	1	4.00	1
2	Garry Drive Entrance 1	40.00	5.00	1	5.00	1	4.00	1
3	Intersection 47 (West Leg)	40.00	5.00	1	5.00	1	4.00	1

Operational Results

2031 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Intersection 47 (East Leg)	None	86		22		300	1195		0.0720	
2	Garry Drive Entrance 1	None	302		74		34	1167		0.2589	
3	Intersection 47 (West Leg)	None	136		186		190	1105		0.1231	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Intersection 47 (East Leg)	None	3.16		3.16	0.23		A		A
2	Garry Drive Entrance 1	None	4.05		4.05	1.05		A		A
3	Intersection 47 (West Leg)	None	3.62		3.62	0.42		A		A

Intersection	
Int Delay, s/veh	5.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	87	81	200	145	122	283
Future Vol, veh/h	87	81	200	145	122	283
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	5	5	5	5
Mvmt Flow	99	92	227	165	139	322

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	920	320	0	0	397	0
Stage 1	315	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.15	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.245	-
Pot Cap-1 Maneuver	301	721	-	-	1145	-
Stage 1	740	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	253	713	-	-	1139	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	542	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25	0	2.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	367	1139	-
HCM Lane V/C Ratio	-	-	0.52	0.122	-
HCM Control Delay (s)	-	-	25	8.6	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	2.9	0.4	-

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Circulating Collector (West Section)	0	0	4.00	1	5.00	1	10.00	30.00	30.00
2	Circulating Collector (West Section)	180	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Chinook Trail Entrance	270	0	4.00	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Circulating Collector (West Section)	40.00	5.00	1	5.00	1	4.00	1
2	Circulating Collector (West Section)	40.00	5.00	1	5.00	1	4.00	1
3	Chinook Trail Entrance	40.00	5.00	1	5.00	1	4.00	1

Operational Results

2031 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Circulating Collector (West Section)	None	126		93		187	1156		0.1090	
2	Circulating Collector (West Section)	None	158		53		166	1178		0.1341	
3	Chinook Trail Entrance	None	202		78		133	1164		0.1735	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Circulating Collector (West Section)	None	3.40		3.40	0.36		A		A
2	Circulating Collector (West Section)	None	3.43		3.43	0.46		A		A
3	Chinook Trail Entrance	None	3.64		3.64	0.62		A		A

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Walsh Drive Entrance	0	0	4.50	1	5.00	1	10.00	30.00	30.00
2	Circulating Collector (North Section)	90	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Circulating Collector (West Section)	180	0	4.00	1	5.00	1	10.00	30.00	30.00
4	Intersection 84 (West Leg)	270	0	4.50	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Walsh Drive Entrance	40.00	5.00	1	5.00	1	4.50	1
2	Circulating Collector (North Section)	40.00	5.00	1	5.00	1	4.00	1
3	Circulating Collector (West Section)	40.00	5.00	1	5.00	1	4.00	1
4	Intersection 84 (West Leg)	40.00	5.00	1	5.00	1	4.50	1

Operational Results

2031 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Walsh Drive Entrance	None	279		103		139	1151		0.2423	
2	Circulating Collector (North Section)	None	140		239		143	1076		0.1301	
3	Circulating Collector (West Section)	None	135		146		233	1127		0.1198	
4	Intersection 84 (West Leg)	None	84		158		123	1121		0.0749	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Walsh Drive Entrance	None	4.01		4.01	0.96		A		A
2	Circulating Collector (North Section)	None	3.75		3.75	0.45		A		A
3	Circulating Collector (West Section)	None	3.53		3.53	0.40		A		A
4	Intersection 84 (West Leg)	None	3.38		3.38	0.24		A		A

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Intersection 86 (North Leg)	0	0	4.50	1	5.00	1	10.00	30.00	30.00
2	Metis Trail Entrance	90	0	4.00	1	5.00	1	10.00	30.00	30.00
3	Circulating Collector (East Section)	180	0	4.00	1	5.00	1	10.00	30.00	30.00
4	Circulating Collector (Norht Section)	270	0	4.50	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Intersection 86 (North Leg)	40.00	5.00	1	5.00	1	4.50	1
2	Metis Trail Entrance	40.00	5.00	1	5.00	1	4.00	1
3	Circulating Collector (East Section)	40.00	5.00	1	5.00	1	4.00	1
4	Circulating Collector (Norht Section)	40.00	5.00	1	5.00	1	4.50	1

Operational Results

2031 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Intersection 86 (North Leg)	None	34		104		167	1151		0.0295	
2	Metis Trail Entrance	None	303		34		104	1188		0.2550	
3	Circulating Collector (East Section)	None	119		290		47	1048		0.1135	
4	Circulating Collector (Norht Section)	None	99		172		237	1113		0.0889	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Intersection 86 (North Leg)	None	3.14		3.14	0.09		A		A
2	Metis Trail Entrance	None	3.95		3.95	1.02		A		A
3	Circulating Collector (East Section)	None	3.78		3.78	0.39		A		A
4	Circulating Collector (Norht Section)	None	3.46		3.46	0.29		A		A

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Metis Trail	0	0	7.00	2	8.50	2	20.00	30.00	30.00
2	Metis Trail	180	0	7.00	2	8.50	2	20.00	30.00	30.00
3	Metis Trail Entrance	270	0	4.00	1	5.00	1	10.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Metis Trail	60.00	5.00	1	10.00	2	7.00	2
2	Metis Trail	60.00	5.00	1	10.00	2	7.00	2
3	Metis Trail Entrance	60.00	10.00	2	5.00	1	4.00	1

Operational Results

2031 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Metis Trail	None	1121		79		253	2222		0.5045	
2	Metis Trail	None	966		982		218	1385		0.6977	
3	Metis Trail Entrance	None	175		157		1790	1151		0.1520	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Metis Trail	None	3.43		3.43	3.43		A		A
2	Metis Trail	None	10.66		10.66	11.44		B		B
3	Metis Trail Entrance	None	3.59		3.59	0.53		A		A

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	0	10	178	1	35	10	145	126	26	217	20
Future Vol, veh/h	20	0	10	178	1	35	10	145	126	26	217	20
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	23	0	11	202	1	40	11	165	143	30	247	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	608	659	269	593	599	247	275	0	0	313	0	0
Stage 1	324	324	-	264	264	-	-	-	-	-	-	-
Stage 2	284	335	-	329	335	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	403	380	762	413	411	784	1271	-	-	1230	-	-
Stage 1	682	644	-	735	685	-	-	-	-	-	-	-
Stage 2	717	637	-	678	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	366	361	753	390	390	775	1264	-	-	1223	-	-
Mov Cap-2 Maneuver	366	361	-	390	390	-	-	-	-	-	-	-
Stage 1	670	621	-	723	673	-	-	-	-	-	-	-
Stage 2	668	626	-	645	615	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	24.3	0.3	0.8
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1264	-	-	442	424	1223	-	-
HCM Lane V/C Ratio	0.009	-	-	0.077	0.574	0.024	-	-
HCM Control Delay (s)	7.9	0	-	13.8	24.3	8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	3.5	0.1	-	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	134	17	262	192	22	152
Future Vol, veh/h	134	17	262	192	22	152
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	2	2
Mvmt Flow	152	19	298	218	25	173

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	176	0	986	172
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	819	-
Critical Hdwy	-	-	4.15	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.245	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1382	-	275	872
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	433	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1374	-	205	862
Mov Cap-2 Maneuver	-	-	-	-	205	-
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	430	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	613	-	-	1374	-
HCM Lane V/C Ratio	0.323	-	-	0.217	-
HCM Control Delay (s)	13.6	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.8	-

Operational Data

Main Geometry (m)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	Metis Trail	0	0	7.00	2	8.50	2	20.00	30.00	30.00
2	Walsh Drive	90	0	7.00	2	8.50	2	20.00	30.00	30.00
3	Metis Trail	180	0	7.00	2	8.50	2	20.00	30.00	30.00
4	Walsh Drive	270	0	7.00	2	8.50	2	20.00	30.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Metis Trail	60.00	10.00	2	8.50	2	7.00	2
2	Walsh Drive	60.00	10.00	2	8.50	2	7.00	2
3	Metis Trail	60.00	10.00	2	8.50	2	7.00	2
4	Walsh Drive	60.00	10.00	2	8.50	2	7.00	2

Operational Results

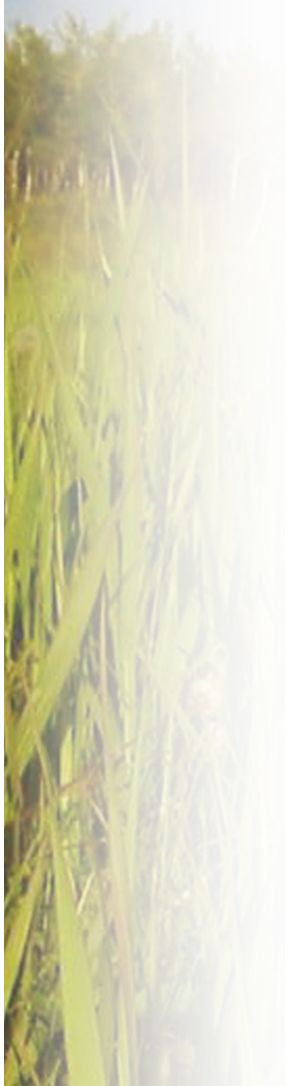
2031 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Metis Trail	None	998		436		888	2000		0.4989	
2	Walsh Drive	None	769		994		440	1626		0.4730	
3	Metis Trail	None	740		954		809	1653		0.4477	
4	Walsh Drive	None	286		1038		656	1596		0.1792	

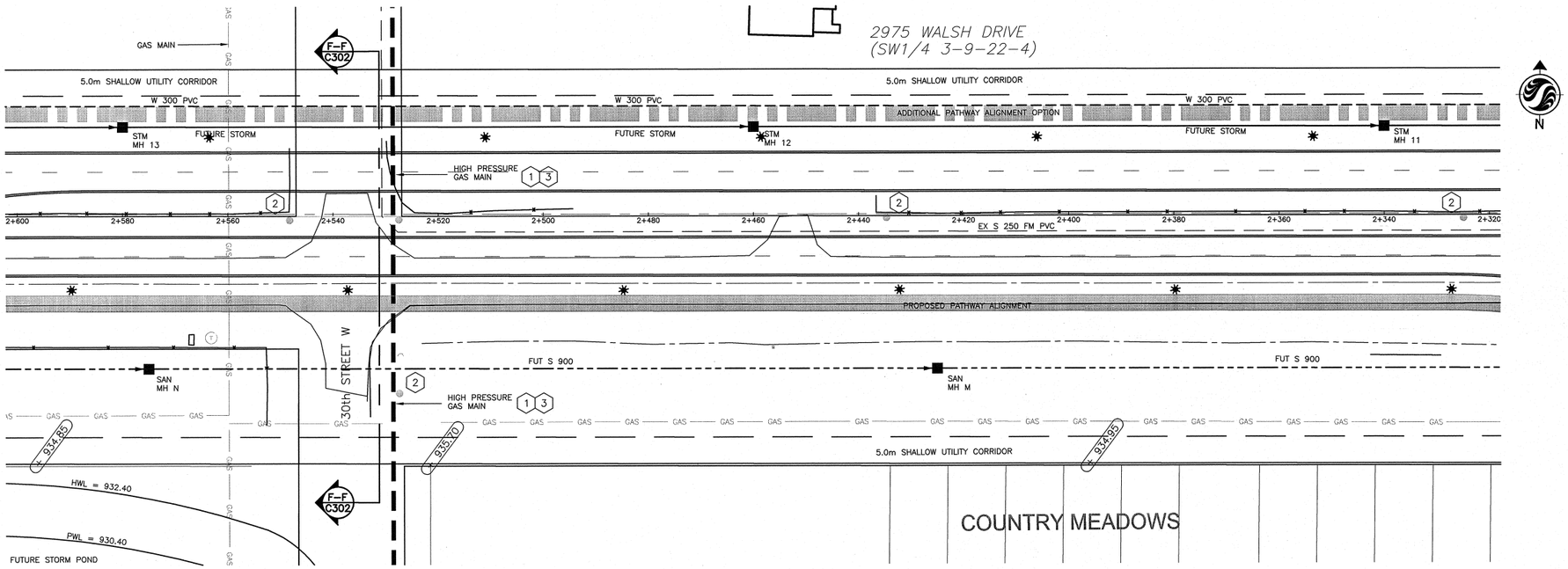
Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Metis Trail	None	4.74		4.74	4.26		A		A
2	Walsh Drive	None	6.81		6.81	4.87		A		A
3	Metis Trail	None	4.96		4.96	3.43		A		A
4	Walsh Drive	None	3.26		3.26	0.83		A		A

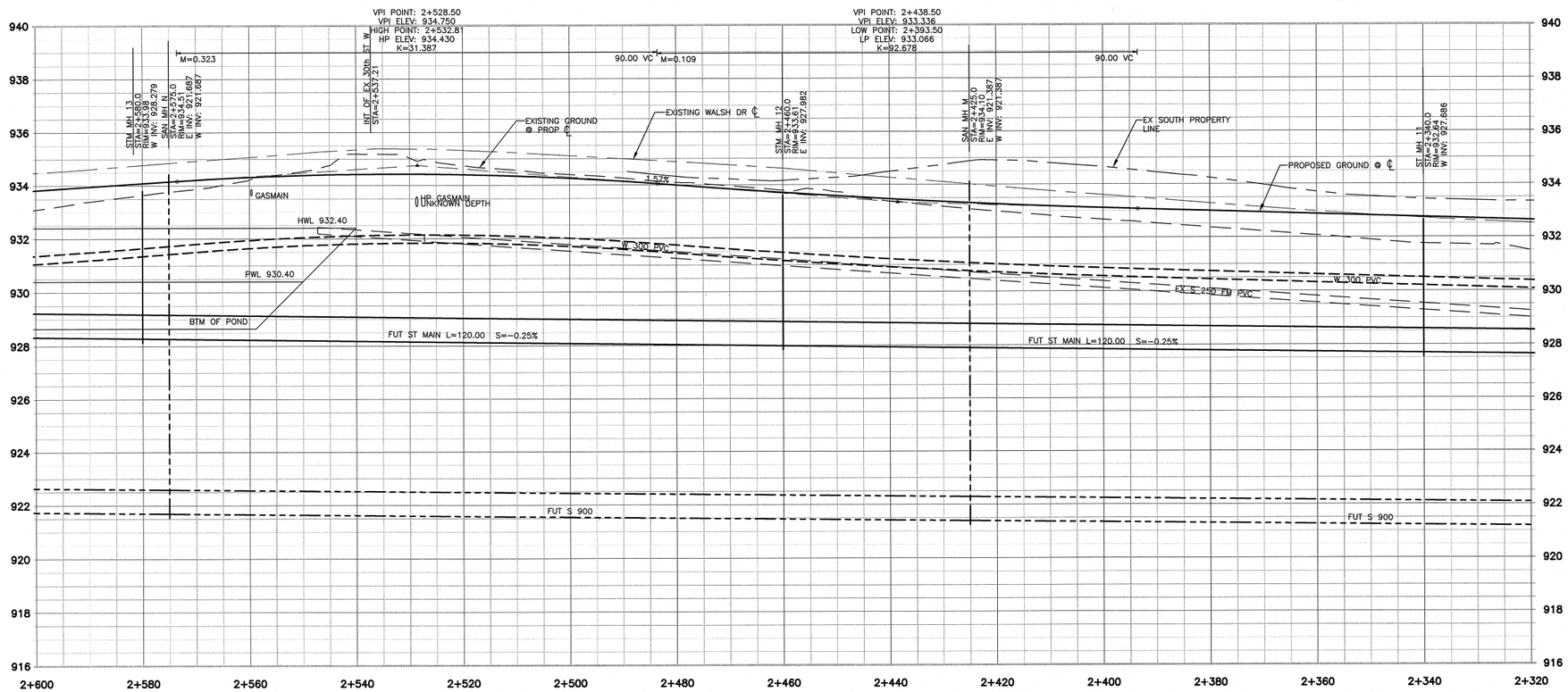


Appendix M

Walsh Drive Preliminary Design Report Drawings (November 2012)



WALSH DRIVE W



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Legend	Proposed	Existing
WATERMAIN		
SANITARY SEWER		
STORM SEWER		
SANITARY FORCEMAIN		
LNID		
MANHOLE TYPE 1	●	○
MANHOLE TYPE 3	■	□
PATHWAY		
PATHWAY (OPTIONAL)		
ATCO GAS		GAS
TELUS		TEL
UG POWER		UG
SHAW		SHW
HIGH PRESSURE ATCO PIPELINES		
POWER POLE		●
GUY POLE		☽
STREET LIGHT BASE	✱	
FINISHED GRADE ELEVATION	+ 934.00	

Notes

DESIGN CONSIDERATIONS:

1. HIGH PRESSURE GAS MAIN WILL NEED TO BE LOWERED TO MAINTAIN REQUIRED COVER
2. OVERHEAD POWER c/w POWER POLES AND GUY WIRES TO BE DECOMMISSIONED AND REMOVED BY OTHERS
3. HIGH-PRESSURE GAS MAIN SHOULD BE HYDROVAC'D PRIOR TO DETAILED DESIGN TO CONFIRM DEPTH AND NEED FOR RELOCATION

E				
D				
C	ISSUED FOR FINAL REPORT	AR	BS	12.12.05
B	ISSUED FOR 70% REVIEW	AR	BS	12.08.21
A	ISSUED FOR 30% REVIEW	AR	BS	12.06.11
Issued		By	Appd.	YY.MM.DD
		AR	BS	HP	12.04.15
Client Number -		Dwn.	Chkd.	Dsgn.	YY.MM.DD

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Date Dec 3, 2012
PERMIT NUMBER: P 258
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

PROFESSIONAL ENGINEER ALBERTA
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LYDON WAITE
Dec 3 2012

Client/Project

CITY OF LETHBRIDGE

WALSH DRIVE IMPROVEMENTS
PRELIMINARY ROADWAY DESIGN
LETHBRIDGE AB CANADA

Title

WALSH DRIVE PROFILE
STA 2+320 TO STA 2+600

Project No. 112945750

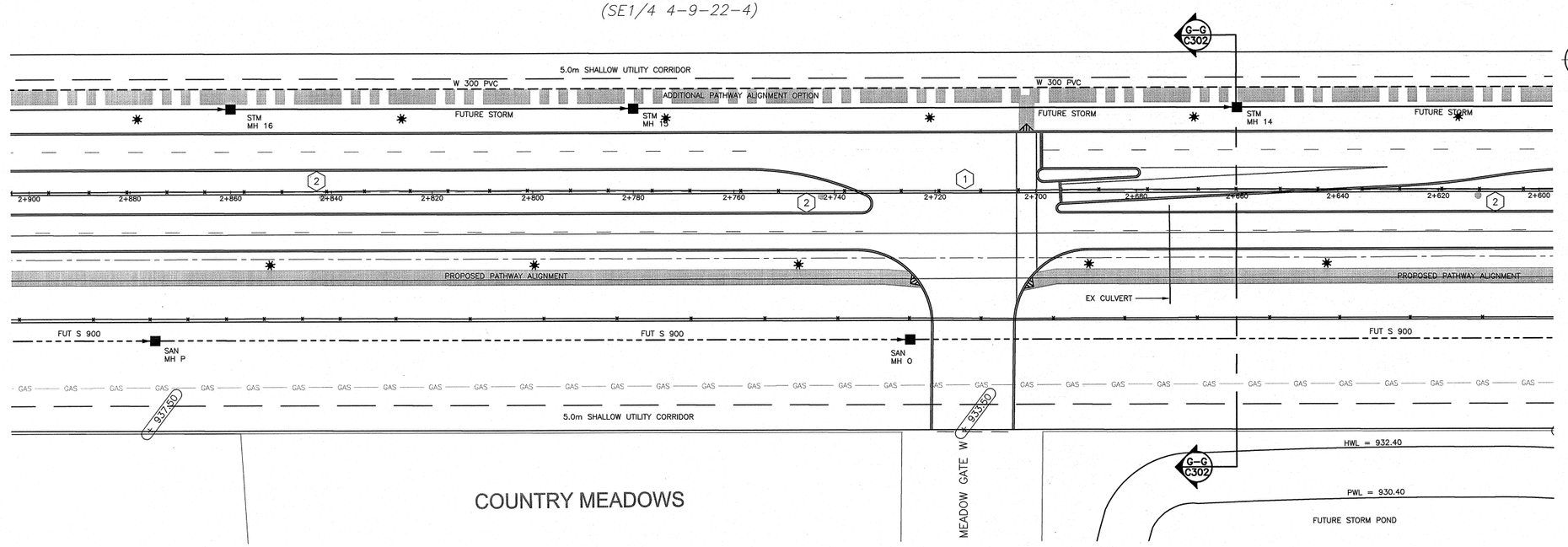
Scale 1:500H 0 5 15 25m
1:100V 0 1 3 5m

Drawing No. C206

Issue/Revision C /

ORIGINAL SHEET – ANSI D 22"x34"

3035 WALSH DRIVE
(SE1/4 4-9-22-4)



WALSH DRIVE W

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Legend	Proposed	Existing
WATERMAIN		
SANITARY SEWER		
STORM SEWER		
SANITARY FORCEMAIN		
LNID		
MANHOLE TYPE 1	●	○
MANHOLE TYPE 3	■	□
PATHWAY		
PATHWAY (OPTIONAL)		
ATCO GAS		
TELUS		TEL
UG POWER		UG
SHAW		SHW
BELL		BEL
POWER POLE		
GUY POLE		
STREET LIGHT BASE	✱	
FINISHED GRADE ELEVATION	+ 934.00	

Notes

DESIGN CONSIDERATIONS:

1. 4-WAY INTERSECTION FOR ACCESS TO WEST LETHBRIDGE EMPLOYMENT CENTRE. REFER TO REPORT FIG. 2.4 FOR OPTIONAL ROUNDABOUT AT THIS LOCATION
2. OVERHEAD POWER c/w POWER POLES AND GUY WIRES TO BE DECOMMISSIONED AND REMOVED BY OTHERS

E				
D				
C	ISSUED FOR FINAL REPORT	AR	BS	12.12.05
B	ISSUED FOR 70% REVIEW	AR	BS	12.08.21
A	ISSUED FOR 30% REVIEW	AR	BS	12.06.11
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		AR	BS	HP	12.04.15
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WALSH DRIVE IMPROVEMENTS
PRELIMINARY ROADWAY DESIGN
LETHBRIDGE AB CANADA

Title

WALSH DRIVE PROFILE
STA 2+600 TO STA 2+900

Project No. 112945750

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1:100V 0 1 3 5m

Drawing No. C207

Issue/Revision C /

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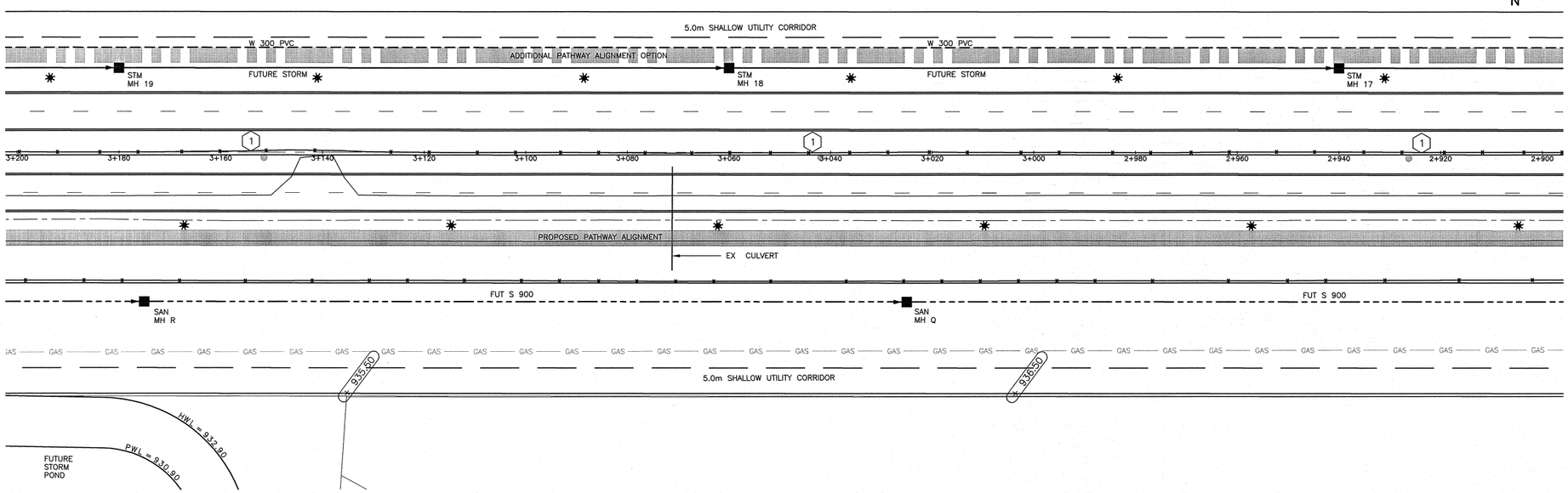
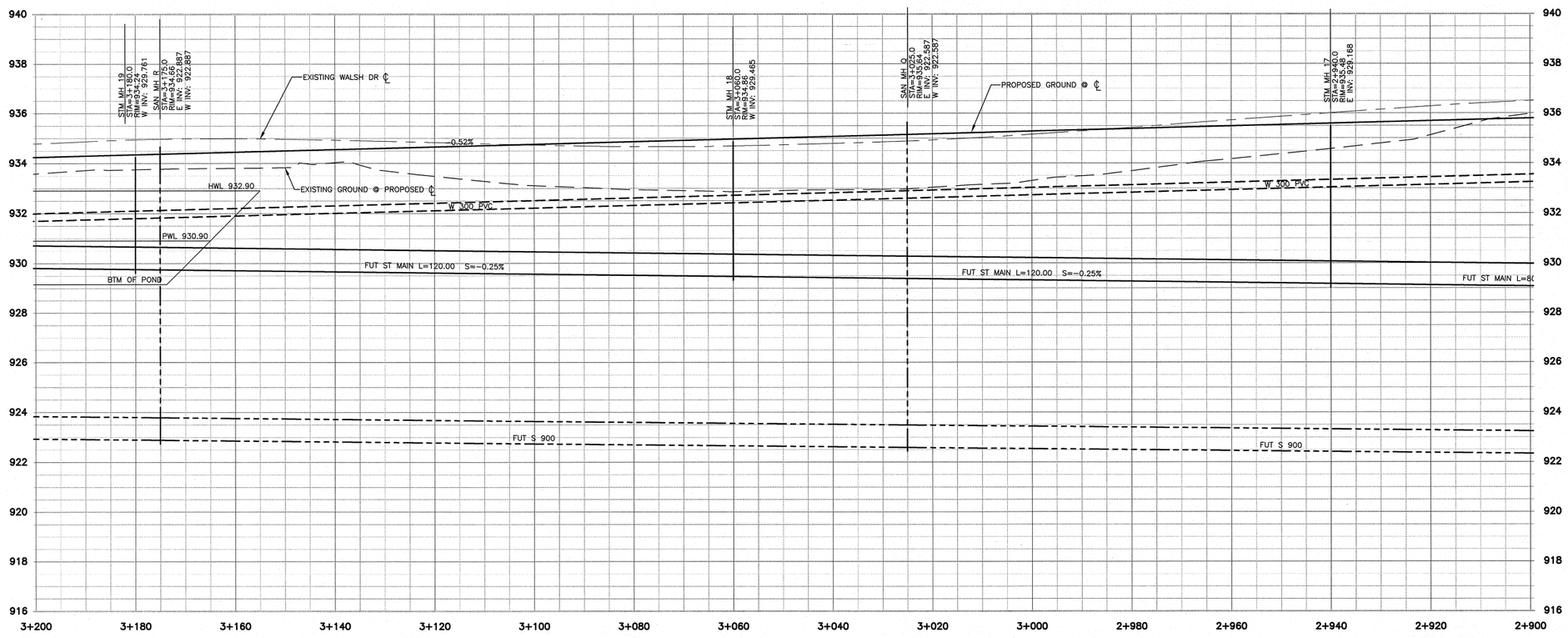
ORIGINAL SHEET – ANSI D 22"x34"





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Legend	Proposed	Existing
WATERMAIN		
SANITARY SEWER		
STORM SEWER		
SANITARY FORCEMAIN		
LNID		
MANHOLE TYPE 1	●	○
MANHOLE TYPE 3	■	□
PATHWAY		
PATHWAY (OPTIONAL)		
ATCO GAS		
TELUS		TEL
UG POWER		UG
SHAW		SHW
BELL		BEL
POWER POLE		
GUY POLE		
STREET LIGHT BASE	✱	
FINISHED GRADE ELEVATION	+ 934.00	

Notes

DESIGN CONSIDERATIONS:

1. OVERHEAD POWER c/w POWER POLES AND GUY WIRES TO BE DECOMMISSIONED AND REMOVED BY OTHERS

E				
D				
C	ISSUED FOR FINAL REPORT	AR	BS	12.12.05
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A	ISSUED FOR 30% REVIEW	AR	BS	12.06.11
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		AR	BS	HP	12.04.15
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WALSH DRIVE IMPROVEMENTS
PRELIMINARY ROADWAY DESIGN
LETHBRIDGE AB CANADA

Title

WALSH DRIVE PROFILE
STA 2+900 TO STA 3+200

Project No. 112945750

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1:100V 0 1 3 5m

Drawing No. C208

Issue/Revision C /

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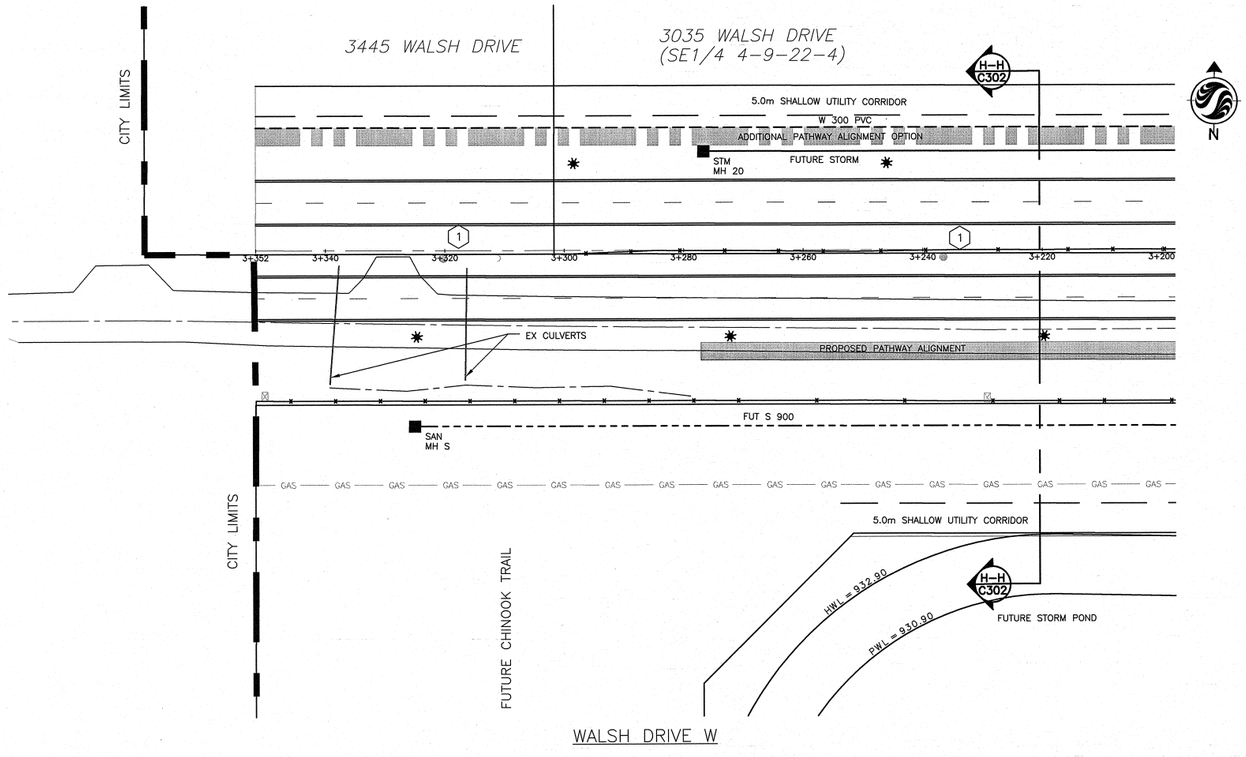
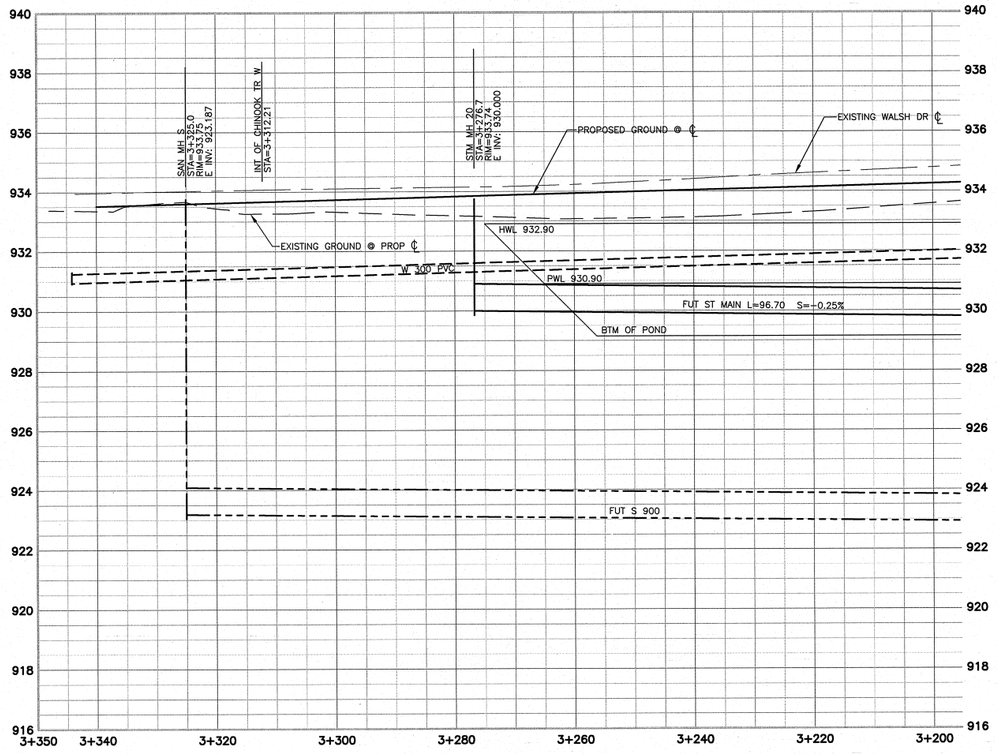


WALSH DRIVE W



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Legend	Proposed	Existing
WATERMAIN		
SANITARY SEWER		
STORM SEWER		
SANITARY FORCEMAIN		
LNID		
MANHOLE TYPE 1	●	○
MANHOLE TYPE 3	■	□
PATHWAY		
PATHWAY (OPTIONAL)		
ATCO GAS		
TELUS		TEL
UG POWER		UC
SHAW		SHW
BELL		BEL
POWER POLE		●
GUY POLE		☽
STREET LIGHT BASE	✱	

Notes

DESIGN CONSIDERATIONS:

1. OVERHEAD POWER c/w POWER POLES AND GUY WIRES TO BE DECOMMISSIONED AND REMOVED BY OTHERS

E				
D				
C	ISSUED FOR FINAL REPORT	AR	BS	12.12.05
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A	ISSUED FOR 30% REVIEW	AR	BS	12.06.11
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		AR	BS	HP	12.04.15
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CITY OF LETHBRIDGE

WALSH DRIVE IMPROVEMENTS
PRELIMINARY ROADWAY DESIGN
LETHBRIDGE AB CANADA

Title

WALSH DRIVE PROFILE
STA 3+200 TO STA 3+350

Project No. 112945750

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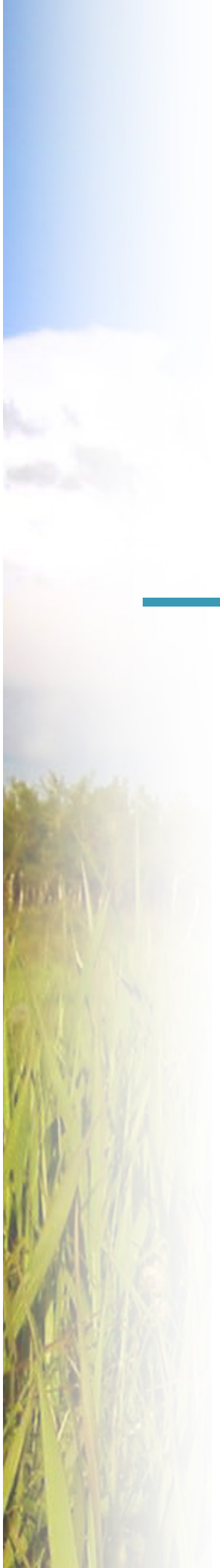
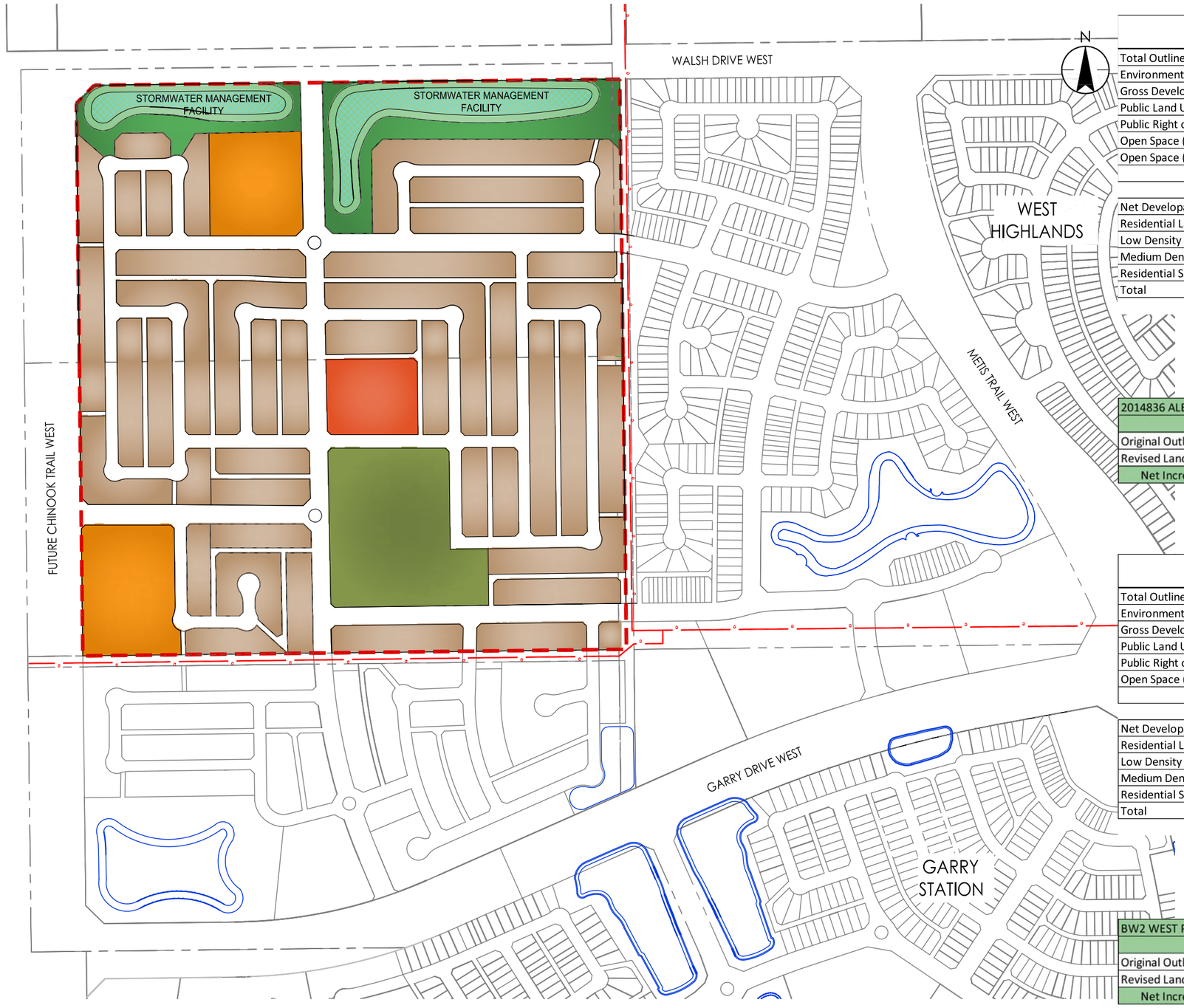
Drawing No. C209

Issue/Revision C /



Appendix N

Amendment Area Land Statistics by Owner



2014836 ALBERTA LTD.	Area (Ha)	Area (Ac)	% of GDA
Total Outline Area	27.89	68.92	
Environmental Reserve	0.00	0.00	
Gross Developable Area (GDA)	27.89	68.92	
Public Land Use			
Public Right of Ways	6.66	16.46	23.9%
Open Space (P-R)	2.56	6.33	9.2%
Open Space (Stormwater Facility)	3.70	9.14	13.3%
Public SubTotal	12.92	31.93	46.3%

				Population Estimates			
Net Developable Area (NDA)	14.97	37.00		Density	Density	Total	Area
Residential Land Use				(UPH)	(UPA)	Units	Population
Low Density Residential	13.19	32.59	47.3%	25	10	330	957
Medium Density Residential	1.78	4.39	6.4%	75	30	133	252
Residential Sub Total	14.97	36.98	53.6%			463	1209
Total	27.89	68.90	100.0%				

2014836 ALBERTA LTD. Population Estimates		
	Total Units	Area Population
Original Outline Plan	489	1193
Revised Landuse	463	1209
Net Increase(+) / Decrease(-)	-26	16

BW2 WEST	Area (Ha)	Area (Ac)	% of GDA
Total Outline Area	29.57	73.08	
Environmental Reserve	0.00	0.00	
Gross Developable Area (GDA)	29.57	73.08	
Public Land Use			
Public Right of Ways	8.05	19.89	27.2%
Open Space (P-B)	3.94	9.74	13.3%
Public SubTotal	11.99	29.63	40.5%

				Population Estimates			
Net Developable Area (NDA)	17.58	43.45		Density	Density	Total	Area
Residential Land Use				(UPH)	(UPA)	Units	Population
Low Density Residential	14.05	34.72	47.5%	25	10	351	1017
Medium Density Residential	3.53	8.73	11.9%	75	30	264	501
Residential Sub Total	17.58	43.45	59.5%			615	1518
Total	29.57	73.08	100.0%				

BW2 WEST Population Estimates		
	Total Units	Area Population
Original Outline Plan	507	1207
Revised Landuse	615	1518
Net Increase(+) / Decrease(-)	+ 108	+ 311

1:3000

Stantec

112948065

February 12, 2019

Legend

- Country Meadows Amendment Boundary
- High Pressure Gas
- Low Density Residential
- Medium Density Residential
- Swing Site
- Open Space (Credit)
- Open Space (Non-Credit)
- Future School Site
- Stormwater Management Facility (Hybrid Pond)

COUNTRY MEADOWS |FIGURE 7.2

Proposed Land Use By Owner

Outline Plan Amendment Area

PREPARED FOR: BW2 WEST & 2014836 ALBERTA LTD.

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