

FIRESIDE STAGE 2

Neighbourhood Plan

2014



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#1906-04

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	Purpose of the Plan and Policy Context.....	1
1.2	Ownership.....	1
2.0	SITE CONTEXT.....	3
2.1	Area and Site Location	3
2.2	Legal Description.....	3
2.3	Plan Area Description	4
3.0	SUPPORTING INFORMATION.....	7
3.1	Supporting Studies – Summary of Findings	7
3.1.1	Geotechnical Evaluation	7
3.1.2	Historical Resource Impact Assessment	8
3.1.3	Biophysical Resources	9
3.1.4	Environmental Site Assessment.....	11
3.1.5	Transportation Policies and Traffic Impact Assessment	12
4.0	THE FIRESIDE STAGE 2 NEIGHBOURHOOD PLAN.....	13
4.1	Community Name	16
4.2	Community Theme	16
4.3	Land Use.....	17
4.3.1	Residential Use.....	17
4.3.2	Commercial Use (as a mixed use)	17
4.3.4	Public Service Uses.....	18
4.4	Design Elements.....	20
4.4.1	Design Elements of the Residential Areas	20
4.4.2	Design Elements of the Commercial-Residential Mixed Use Site	20

4.4.3	The Neighbourhood Node	21
4.4.4	Road Design	21
4.4.5	North and South Boundary	23
4.4.6	Central Park.....	23
4.4.7	Pipeline ROW & Off-Leash Dog Park.....	24
4.4.8	Environmental Reserve	24
4.5	Transportation Routes and Networks.....	25
4.5.1	Permanent & Emergency Access Routes	25
4.6	Pedestrian Oriented Development	27
4.7	Crime Prevention through Environmental Design.....	31
4.8	Housing Diversity, Streetscape and Architectural Development	32
5.0	NEIGHBOURHOOD PLAN STATISTICS	33
6.0	DENSITY	35
7.0	UTILITY SERVICING	36
7.1	Water Main Distribution	36
7.2	Sanitary Servicing.....	36
7.3	Stormwater Management	36
8.0	PHASING	37
9.0	FIRESIDE WETLANDS	40
9.1	Wetland Compensation	40
9.2	Wetland & Riparian Area Restoration & Enhancement	41
10.0	MUNICIPAL ENVIRONMENTAL IMPACT STATEMENT (MEIS)	44
11.0	SUSTAINABILITY	48
11.1	Planning Principles of the Sustainability Matrix	48
11.2	The Cochrane Sustainability Plan.....	51

APPENDIX

APPENDIX A: Municipal Reserve Concept Plans	54
APPENDIX B: Fireside Street 21.0m Collector Cross Section	62
APPENDIX C: Water Act Approval	66

TABLES

Table 1: Fireside Stage 2 Neighbourhood Plan Statistics	34
Table 2: Overall Fireside Municipal Reserve Dedication.....	35
Table 3: Overall Fireside Density.....	35
Table 4: Overall Fireside Wetland and Riparian Area Balance	42

FIGURES

Figure 1: Fireside Location Plan	2
Figure 2: Development Considerations	6
Figure 3: Wetland 16 to be conserved.....	10
Figure 4: Fireside Stage 2 Community Layout	15
Figure 5: Proposed Land Use Amendments.....	19
Figure 6: Key Design Elements of Fireside Stage 2	22
Figure 7: Example of Parking Option	23
Figure 8: Transportation Network	26
Figure 9: Potential Future Bus Route	29
Figure 10: Open Space and Connectivity Plan	30
Figure 11: Conceptual Utility Plan.....	37
Figure 12: Phasing Plan	39
Figure 13: North Wetland & Setback Area	42
Figure 14: Fireside Habitat Plan	43

1.0 INTRODUCTION

1.1 *Purpose of the Plan and Policy Context*

The Fireside Stage 2 Neighbourhood Plan will provide direction for the planning and development for the remainder of lands within the Fireside Community. The Fireside Stage 1 Neighbourhood Plan was approved by Council in June 2010. Fireside Stage 1 included the eastern portion of the community, and Stage 2 will include the remaining western lands.

The FS2NP adheres to the approved *Westridge Area Structure Plan* (April 2009), the *Town of Cochrane Municipal Development Plan* (October 2008), and the *Cochrane Sustainability Plan* (May 2009).

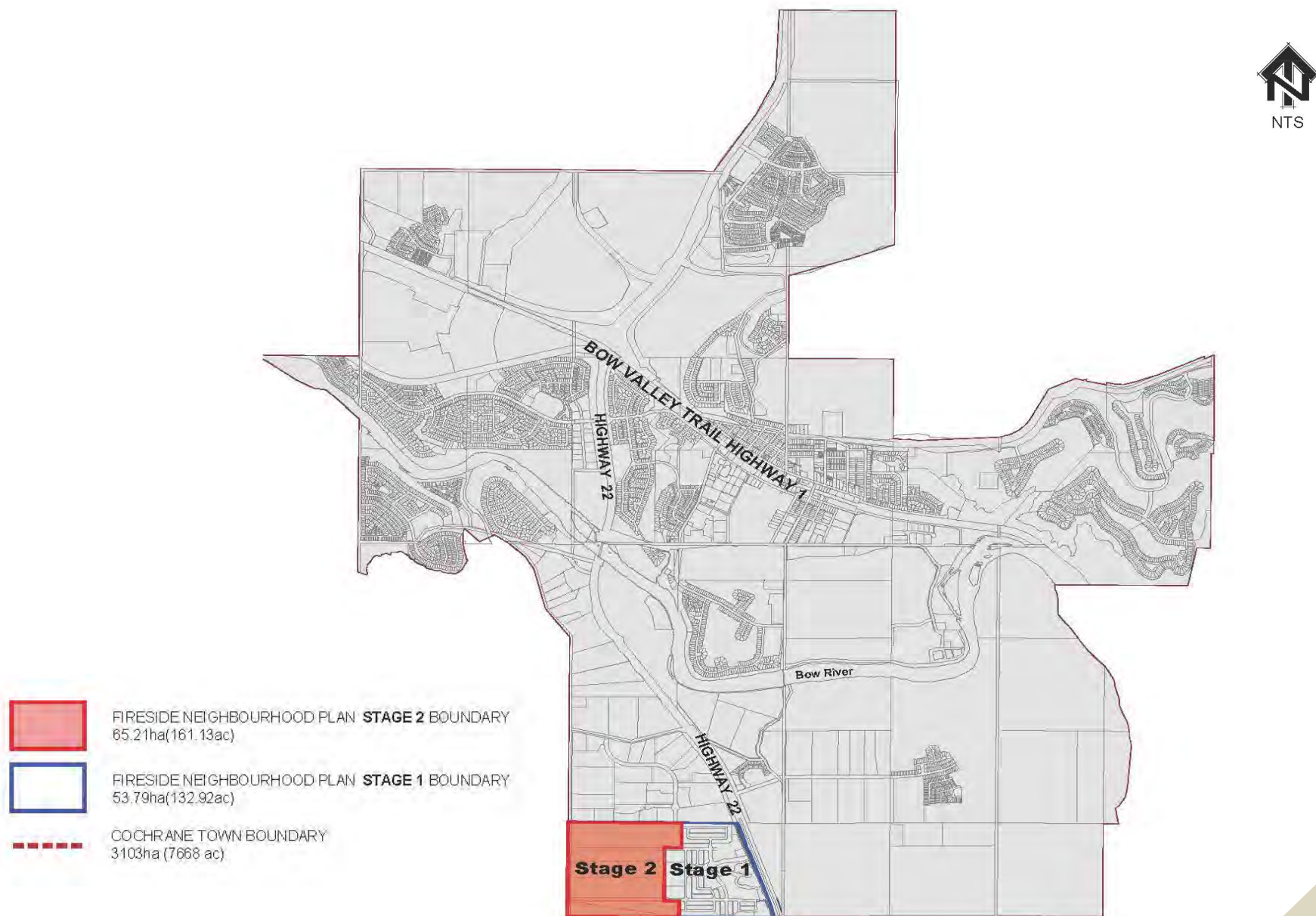
The policy context for a Neighbourhood Plan is provided under Section 14.3.2 Area Plan Policies of the *Town of Cochrane Municipal Development Plan* (MDP). Items (d) through (g) under this Section outline the base information required. The FS2NP follows and builds on this guide.

The Fireside Stage 1 Neighbourhood Plan provides direction for a community that offers a well thought-out transportation network, is pedestrian oriented, provides housing variety, and an innovative stormwater management solution. The Fireside Stage 2 Neighbourhood Plan will build on this foundation to complete the community.

1.2 *Ownership*

The FS2NP lands are currently under the ownership of two corporate entities being, Tirion Properties Ltd., and La Vita Land Inc.

Figure 1: Fireside Location Plan



2.0 SITE CONTEXT

2.1 Area and Site Location

The FS2NP area is located within the southwest sector of the Town of Cochrane, immediately west of the FS1NP, and comprises approximately 65.21 hectares (161.13 acres).

The FS2NP Lands are bound by the following:

- Rolling Range Estates is located to the north. This area has a land use designation of Residential - Urban Reserve (UR-R) and is made up of a former Rocky View County Country Residential Development that is now located within the Town boundary;
- The east boundary is adjacent to the developing community of Fireside Stage 1.
- The south and west boundary of the FS2NP coincides with the southwest boundary of the Town. Lands beyond this boundary fall under the jurisdiction of Rocky View County. The majority of the adjacent Rocky View County lands are agricultural use, primary ranching operations; and unopened road allowance owned by the Town runs along the south boundary and the majority of the west boundary of Fireside Stage 2.

2.2 Legal Description

The Lands of the FS2NP form a portion of the lands legally defined as follows:

- 1) Title Number: 131 204 254

PLAN 1311727

BLOCK 1

LOT 1

EXCEPTING THEREOUT ALL MINES AND MINERALS

AREA: 21.62 HECTARES (53.42 ACRES) MORE OR LESS

2) Title Number: 131 151 585 +1

PLAN 1311727

BLOCK 1

LOT 2

EXCEPTING THEREOUT ALL MINES AND MINERALS

AREA: 21.62 HECTARES (53.42 ACRES) MORE OR LESS

2) Title Number: 131 151 585 +2

PLAN 1311727

BLOCK 1

LOT 3

EXCEPTING THEREOUT ALL MINES AND MINERALS

AREA: 21.62 HECTARES (53.42 ACRES) MORE OR LESS

The FS1NP covers the full area of Title 991 339 899 at 49.29 hectares (121.80 acres), and a 3.04 hectare (7.51 acre) portion of Title 071 364 204. Together with the Town's 1.44 hectare (3.56 acre) undeveloped road allowance, that was included within the FS1NP, this forms the total 53.77 hectares (132.87 acres) of the FS1NP.

2.3 Plan Area Description

The *Westridge Area Structure Plan* (WR-ASP) contains 119.04 hectares (294.05 acres). Within the WR-ASP, the approved FS1NP provided the development direction for the easterly 53.79 hectares (132.92 acres) and the FS2NP provides the same for the westerly 65.21 hectares (161.13 acres).

The WR-ASP lands have historically been used for livestock grazing, and consist mainly of a gently rolling/hummocky terrain. The FS2NP lands contain an existing single family residence and some associated agricultural buildings.

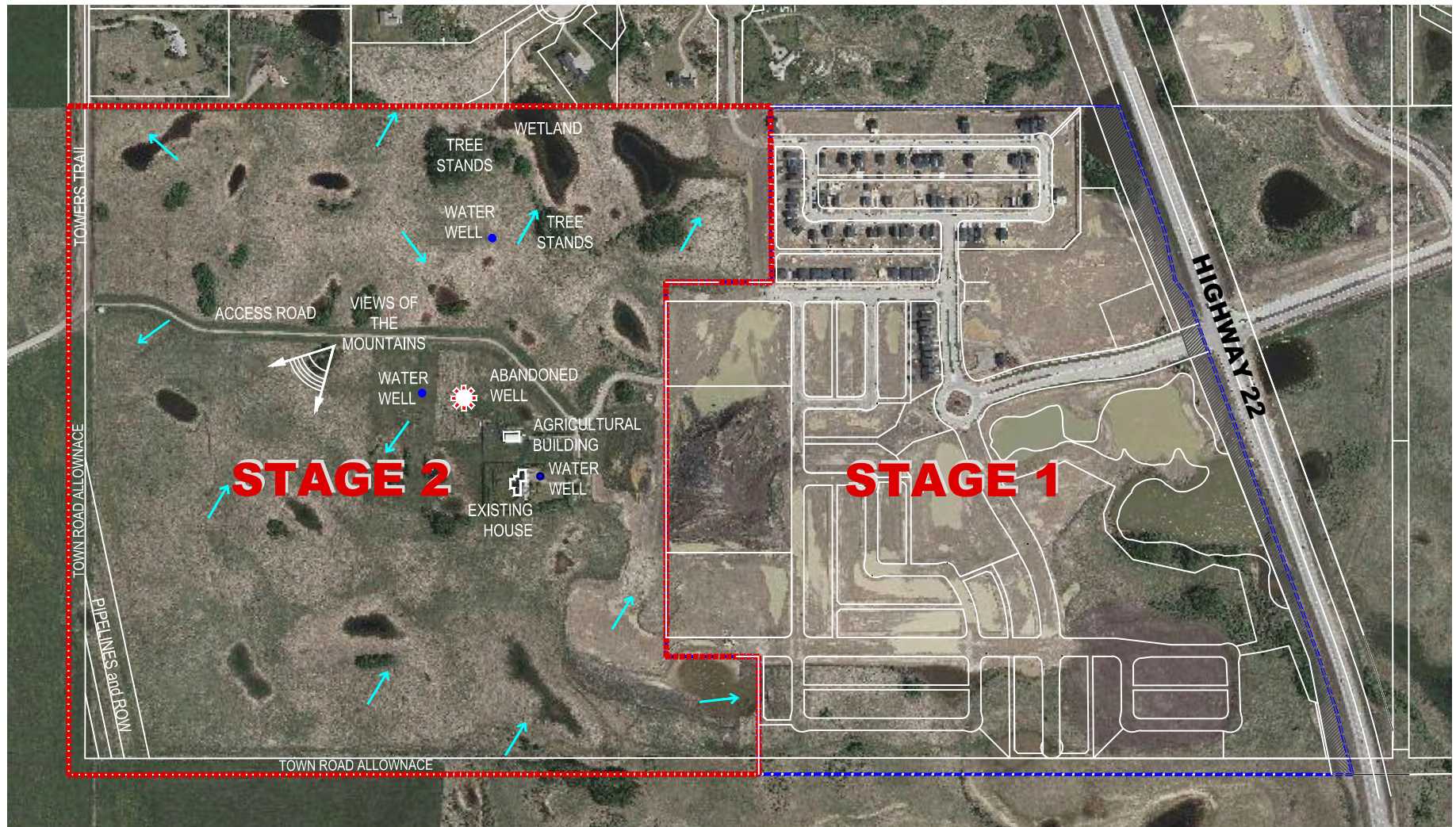
The WR-ASP lands contain multiple small wetland areas of various classifications. Of these, three sites were deemed to be of greater significance. The wetland compensation and mitigation plan were determined with the approval of the WR-ASP, which included retaining the three wetlands of greater significance, enhancing these wetlands and developing a naturalized stormwater management

facility utilizing on-site wetland vegetation. The other wetlands were compensated for, both financially and through on-site no-net-loss compensation. Financial compensation is provided to Ducks Unlimited through Alberta Environment. The compensation and mitigation plan were approved by Alberta Environment through a Water Act approval. A copy of the Water Act approval can be found in the Appendix.

One of the three conserved wetlands falls within the FS2NP and is located along the north boundary of the plan area. This site is a seasonally wet area and is incorporated into the FS2NP as environmental reserve. A significant surrounding habitat area, including existing tree stands, is also being protected as environmental reserve to help maintain natural drainage and the ecological value of the wetland.

Upland native grasslands form the surface cover over the majority of the WR-ASP and the FS2NP. Within this, there are scattered wooded areas located in small pockets throughout the WR-ASP area. These wooded areas are limited in their amount of large tree coverage and consist mainly of deciduous scrub and brush.

The WR-ASP's overall site is relatively flat in terms of total elevation change. The majority of the lands have a north easterly aspect as they generally slope from approximately 1215 metres (3986 feet) in the west and southerly portions of the WR-ASP area, down to approximately 1197 metres (3927 feet) in the easterly portion of the WR-ASP area. This is an elevation difference of approximately 18 meters (59 feet) over an approximate 1.60km (1.00 mile) south-west to east distance. The northeasterly quarter of the WR-ASP lands slope down from the north-west towards the east.



Legend

--- STAGE 2 NEIGHBOURHOOD BOUNDARY

→ DRAINAGE DIRECTION



Figure 2:
DEVELOPMENT CONSIDERATIONS

3.0 SUPPORTING INFORMATION

3.1 *Supporting Studies – Summary of Findings*

Several background studies were completed for the *West Ridge Area Structure Plan* (WR-ASP) and the *Fireside Stage 1 Neighbourhood Plan* (FS1NP). They provide the base physical evaluation of WR-ASP lands so that future development plans may be set to ensure that the noted constraints are incorporated into the planning design.

The following is a summary of the main findings each of the main reports related to the WR-ASP and FS2NP lands.

3.1.1 Geotechnical Evaluation

A Geotechnical Evaluation, dated February 2008, was prepared by McIntosh Lalani Engineering Ltd.¹ for the WR-ASP area. The Geotechnical Evaluation investigation references the intermittent encounter of high plastic clays. To follow up with this finding in the original study, McIntosh Lalani prepared a follow up letter dated September 2, 2008². This follow up letter states that high plastic clays were intermittently encountered in the form of lenses (a thin, strata layer) within the lacustrine clay layer in seven of the twenty one boreholes drilled throughout site.

The September 2, 2008² letter indicates developing residential subdivisions in areas with some high plastic clays can be undertaken, provided the correct methods are employed during the grading stage, and during house footing construction. The September 2, 2008² letter also states that these methods are accepted construction practices successfully applied within the Town of Cochrane in other existing developments containing similar areas of high plastic clay, provided:

- a comprehensive phased soil analysis is completed;
- specific recommendations relative to the detailed design and construction of the development are prepared and incorporated; and
- geotechnical field supervision in undertaken to ensure implementation the specific recommendations.

This work will be undertaken by the developer and the geotechnical engineer retained by the developer.

¹ McIntosh Lalani Engineering Ltd. Geotechnical Evaluation 282 Acre Parcel, Cochrane Alberta, February 2008

² McIntosh Lalani Engineering Ltd. West Ridge Area Structure Plan Geotechnical Evaluation Letter Sept. 2, 2008

The Geotechnical Evaluation also makes recommendations for construction within the WR-ASP to accommodate the sub-surface soil and groundwater conditions. Stand pipes have been installed in all boreholes to monitor the impact of future development on the groundwater levels. The final design of the facilities dealing with groundwater are to be completed, within the detailed engineering drawings for the project, prior to the construction phase. The September 2, 2008² letter indicated that methods to be employed during the grading operation, underground utility installation, and construction of the homes, will minimize the impact on shallow ground water if encountered.

The Geotechnical Evaluation does not identify any unstable slopes or any soil conditions that would prevent the development of the site provided appropriate engineering practices are undertaken during construction.

In summary, the Geotechnical Evaluation does not present any findings that would restrict the residential development of the WR-ASP lands. However, the Geotechnical Evaluation indicates development will require specific practises be employed to address certain clays within the soil, and requires the ongoing monitoring of onsite groundwater during development.

3.1.2 Historical Resource Impact Assessment

Historical Resource Management Ltd. completed a Historical Resource Impact Assessment³ (HRIA) dated May 21, 2008 for WR-ASP lands. Surface reconnaissance and subsurface testing were undertaken on the property, and no buried soils or historical resources were identified. Based on the conclusions of the HRIA, the WR-ASP lands were granted Historical Resources Act Clearance by Historic Resource Management, Alberta Culture and Community Spirit on September 26, 2008.

In summary, no further action with regard to historical resources within the WR-ASP is required. This is confirmed by the Historical Resources Act Clearance

³ Historical Resource Management Ltd. – Historical Resources Impact Assessment, Tirion Properties Final Report, Permit 08-104, May 21, 2008

3.1.3 Biophysical Resources

A Biophysical Overview⁴ (February 2008), and a detailed Wetland Assessment⁵ (September 2008), were completed by Sweetgrass Consultants Ltd. for the entire Westridge ASP area. To further understand Wetland 16 as identified in the Sweetgrass studies, a Wetland Mitigation Report⁶ was prepared by Stantec Consulting Ltd. in August 2013. Each of these reports is briefly discussed below, and submitted under separate cover.

3.1.3.1 Biophysical Overview and Wetland Assessment by Sweetgrass Consulting Ltd.

In the Biophysical Overview⁴ and Wetland Assessment⁵, Sweetgrass Consultants identified 45 wetlands on the entire WR-ASP area, covering a cumulative area of 23.42 acres. Three wetland areas were noted as more significant, two were located in FS1NP and one is located within the FS2NP.

The preserved wetlands in FS1NP were the only Class IV wetlands on the property.

The area within the FS2NP that was noted as more significant includes a Class III wetland (Wetland 16), and its associated upland riparian habitat which includes a small Class II wetland, and adjacent deciduous woodland and willow shrub land. This area will be conserved within the FS2NP.

Rare plants were also identified within a non-native grassland area, adjacent to wetland 45 (see Figure 11). These plants will be relocated to the conserved wetland 16 and riparian area along the FS2NP north boundary.

The details of the wetland compensation and preservation provided in the Fireside Community are found in Section 7.3.1.

⁴ Sweetgrass Consultants Ltd. - West Ridge Biophysical Overview, February 2008

⁵ Sweetgrass Consultants Ltd. – West Ridge Area Structure Plan Response to CEC Report to Council dated July 31, 2008 Comments on Developer’s Supporting Documents
Biophysical Overview and Wetlands

⁶ Stantec Consultants Ltd. – Wetland Mitigation Report, August 2013

3.1.3.2 Wetland Mitigation Report by Stantec Consulting Ltd.

A Wetland Mitigation Report was completed in August 2013 by Stantec Consulting Ltd. The purpose of the mitigation report was to undertake a pre-development functional assessment of Wetland 16 in three categories; hydrology, biology and social-economics.

Hydrology: it was determined that Wetland 16 is likely sustained by overland water drainage and not fed by groundwater sources. Therefore, continued overland water supply will be required to sustain the wetland.



Figure 3: Wetland 16 to be conserved

Biology: Three upland habitats surround Wetland 16; Native Grassland which perimeters the majority of the wetland, Deciduous Woodland that is present in two localized areas on the west and south side of the wetland, and Willow Shrubland that is present as a narrow band along the west and south side connecting the woodland areas.

Field reconnaissance verified that Wetland 16 is a Class III Seasonal Pond with wetland vegetation communities including low prairie, wet meadow and shallow marsh. The vegetation species found within the vegetation communities is tabled in the Wetland Mitigation Report.

The wetlands within the Fireside lands have been heavily degraded by habitat fragmentation and livestock grazing. The heavy grazing and intensive livestock trampling have increased the turbidity of the water and promoted the invasion of non-native plant species. This disturbance has created limited habitat potential for wildlife. The Sweetgrass Biophysical Overview identified four Sensitive Species (species that are not at risk of extinction or extirpation but may require special attention or protection to prevent them from becoming at risk) within the Westridge ASP lands. Three of these Sensitive Species were identified within the Wetland 16 complex.

Social-Economics: A low social-economic score was assigned to Wetland 16 in its current state, but it will show a considerable increase as the retention of the wetland will provide the residential community with a wide range of benefits as it becomes fully integrated into the community.

Detailed restoration and monitoring recommendations are made within the Wetland Mitigation Report. As part of the mitigation measures, a total buffer width of 15 metres is recommended around Wetland 16. This buffer shall include a 6 metre Environmental Reserve in accordance with the Municipal Government Act, as well as an additional 9 metres which can include Municipal Reserve and recreation space. The surrounding upland habitat adjacent to Wetland 16 may be retained as part of the FS2NP open space.

3.1.4 Environmental Site Assessment

A Phase One Environmental Site Assessment⁷ (ESA) dated November 28, 2007, was performed by Base Property Consultants Ltd. with a follow up letter dated September 2, 2008⁸.

The ESA noted that potential environmental impairment in the form of an abandoned oil and gas well may exist on lands within the FS2NP. The abandoned well has been confirmed as an orphaned well that was drilled but never operated.

Four water wells and a septic sewer system, which serve the existing residence, are found on the subject lands. When these services are no longer required they must be reclaimed in an appropriate manner. The ESA notes that soils can be left to remediate themselves over time, but as this can take multiple years, these soils will be removed during the remediation process.

Further environmental investigations will be required to identify steps for remediation. This additional environmental investigation is required prior to a subdivision application that includes the affected lands. Any required remediation will be done during construction to the satisfaction of the Town.

⁷ Base Property Consultants Ltd. – Phase One Environmental Site Assessment, November 28, 2007

⁸ Base Property Consultants Ltd. – Westridge Area Structure Plan – Response to Cochrane Environmental Committee Report to Council, September 2, 2008

3.1.5 Transportation Policies and Traffic Impact Assessment

The original Traffic Impact Assessment (TIA) was completed for the Westridge ASP in February 2008. Subsequent to that TIA, two update letters were prepared by Bunt & Associates, the first one dated June 2009, was to review the internal road network as part of the Fireside Stage 1 Neighbourhood Plan application process, and the second one was in July 2012 to review the impacts of a Gas Bar and potential Tim Horton's within the Direct Control Commercial- Residential Mixed-Use District.

To support the FS2NP a third update dated August 28, 2013⁹ has been prepared by Bunt & Associates and submitted under separate cover. This update reviewed the impacts of FS2NP on internal and external roads. The conclusion of this update found that the *long term post development* analysis indicates:

1. Dual left turns are required in both the eastbound and northbound directions at the Highway 22/Fireside Gate intersection, and
2. A traffic signal is warranted Fireside Gate and the all-turns intersection into the Commercial – Residential Mixed Use Site to the north. This signalization would be required in the long term with the current intensity assumptions for the Commercial – Residential Mixed Use Site. Should the site develop to a lesser intensity, the need for signalization at full build out should be revisited.

⁹ Bunt & Associates Transportation Planners and Engineers – Westridge of Cochrane Fireside Stage 2 Neighbourhood Plan, August 28 2013

4.0 THE FIRESIDE STAGE 2 NEIGHBOURHOOD PLAN

The West Ridge Area Structure Plan (WR-ASP) is the planning base for a mixed use community with residential development forming the predominant component. Fireside Stage 1 was the first Neighbourhood Plan within the WR-ASP, and Fireside Stage 2 will complete the community.

The Fireside Stage 2 Neighbourhood Plan (FS2NP) forms the western portion of the WR-ASP area and will continue the theme and higher density feel of the Fireside community.

The Fireside key design elements are the building blocks of a complete community and include:

- ❖ *A variety of housing options to meet a range of needs for residents;*
- ❖ *A mixed use development allowing for local services (this also provides some local employment opportunities);*
- ❖ *A central park with a fire pit for community gathering and active play areas;*
- ❖ *Centrally located school sites offering education and work opportunities within walking distance to residential units;*
- ❖ *An environmental reserve area that will conserve a large Class III and associated upland habitat including a Class II wetland, plus adjacent tree and shrub areas;*
- ❖ *On off-leash dog park connected to other linear open spaces and play parks;*
- ❖ *A modified grid road network to provide a variety of options for pedestrian and vehicular movement.*

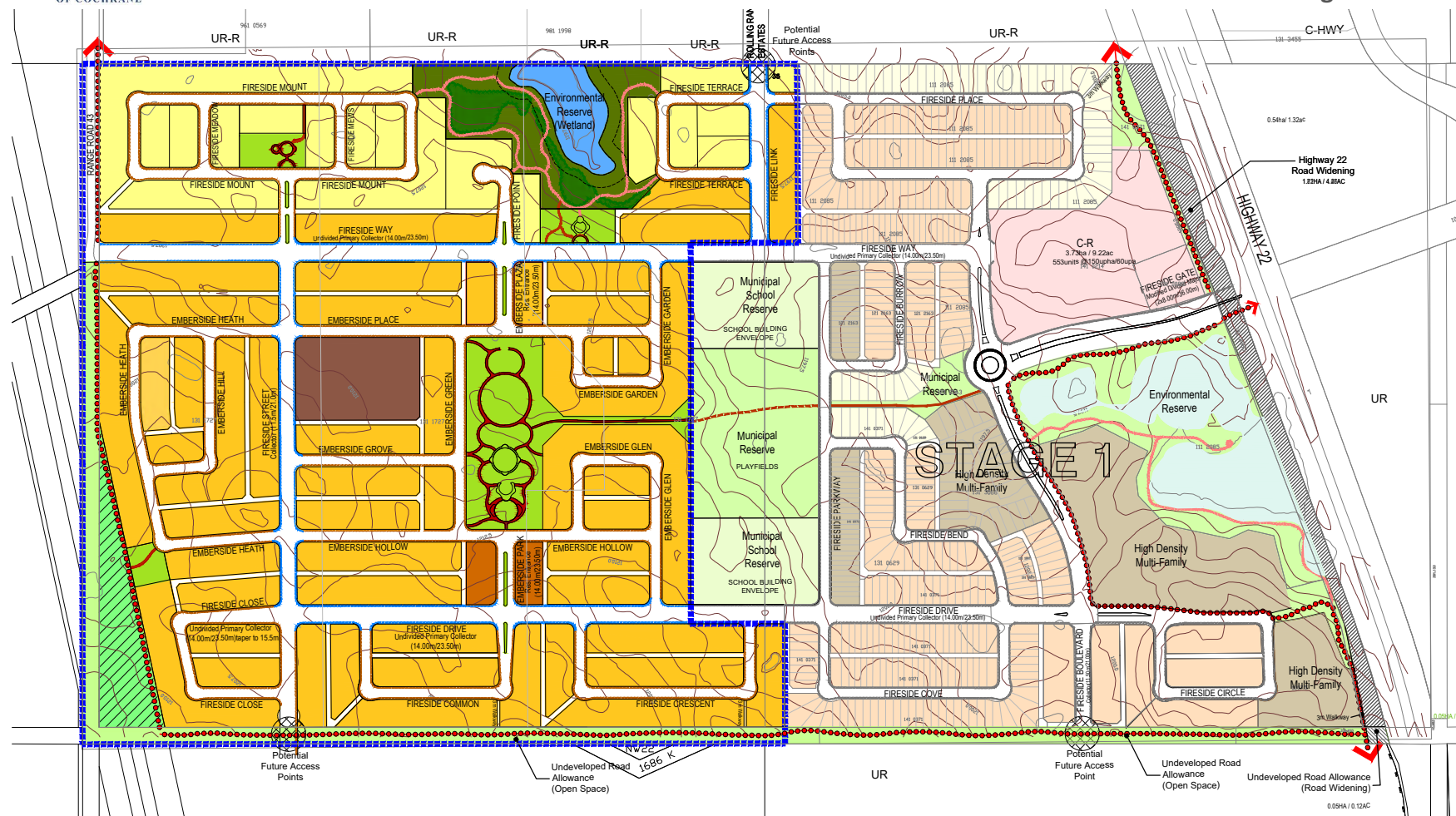
The Community Layout for Fireside Stage 2 is provided in Figure 4.

Adjacent to and bounding the south and west sides of the WR-ASP and the FS2NP boundary, are undeveloped road allowances owned by the Province and maintained by the Town of Cochrane. The south and west boundaries of these road allowances form the Town Boundary. The Town expressed their interest in creating a linear open space within their undeveloped road allowance, to be used as a linear greenspace and a buffer to the agricultural uses to the south during the preparation of the Fireside Stage 1 Neighbourhood Plan. Therefore a portion of the undeveloped road allowance was designated as a Public Service lot with FS1NP. The FS2NP will provide the remainder of the undeveloped road allowance for the same use. The developer of Fireside will construct the community's regional pathway within this right-of-way, as well as provide fencing in a form agreed upon with the adjacent landowner: a 5 foot no-climb fence on the south and west sides of the right-of-way, and a 4 foot chain-link fence with gates on the north and east sides of the right-of-way.

To utilize the open space encumbered by the gas line rights-of-way in the southwest portion of the community, and make this land an important and useful part of the community and open space network, this area is proposed to become an off-leash dog park. The location is ideal for an off-leash dog park because it is directly connected to the un-opened road allowance that will include the regional pathway providing good pedestrian and dog access to the park. In addition, should the Town expand its boundary west or south, additional portions of the utility right-of-way could be added to expand upon the dog park.

The Fireside community is an urban format development that falls adjacent to a country residential development to the north and rural agricultural uses on all other sides with the exception of Hwy 22. The FS2NP incorporates several elements designed to mitigate the effects of the urban development on the adjacent rural lands. The primary of these being:

- The placement of the larger lots in the neighbourhood along the north boundary of the community to provide transition from the larger country residential style parcels to smaller urban style parcels;
- The use of its open greenspaces. Open greenspaces make up a large portion of the WR-ASP boundary and through this manner the FS2NP utilizes the open greenspaces as a physical separation between the higher density urban community and the country residential and agricultural uses; and
- Construction of fencing along the un-opened road allowance along the south and west boundaries of Fireside. The style of fencing chosen will serve the needs of both the agricultural uses and urban residential uses: a 5 foot no-climb fence adjacent to the agricultural uses and a 4 foot chain link fence with gates adjacent to the urban residential homes.



Legend

- COCHRANE TOWN LIMITS
- STAGE 2 NEIGHBOURHOOD PLAN BOUNDARY

- SINGLE DETACHED DWELLING - LANELESS
- SINGLE, SEMI DETACHED OR TOWN HOUSE - LANED
- TOWN HOUSE - LANED
- HIGH DENSITY MULTI-DWELLING

- ENVIRONMENTAL RESERVE
- MUNICIPAL RESERVE
- UNOPENED ROAD ALLOWANCE
- REGIONAL UTILITY ROW

- 1.5m MONOLITHIC SIDEWALK

- 1.5m SEPARATE SIDEWALK

- 3.0m REGIONAL PATHWAY

- LOCAL PATHWAY

- POTENTIAL LOCAL PATHWAY CONNECTION

- NATURE TRAIL

NOTES:

- ALL ROADS ARE RESIDENTIAL STANDARD (9m/15.5m) UNLESS OTHERWISE NOTED.
- ALL LANES ARE 6.0m WIDE



Figure 4:
COMMUNITY LAYOUT

4.1 Community Name

The Fireside Stage 2 Neighbourhood Plan carries forward the name and theme of the Fireside Community. The name 'Fireside' and the design theme for Fireside are inspired by elements of our regional First Nations People. The name and theme are intended to complement the existing Western Heritage theme utilized in the Town of Cochrane.

4.2 Community Theme

The community theme which celebrates the fireside as a meeting and social gathering place for conversation and community is further enhanced in Fireside Stage 2. This theme will be illustrated through several outlets.

- Decorative landscaping will make use of natural materials such as stone or wood to reflect elements of the regional First Nations art and culture.
- The green landscaping throughout the community will be limited to indigenous plants and vegetation and conform to the Town of Cochrane landscaping requirements.
- A public fire pit will be located at the north end of the central park. The fire pit and surrounding landscaping shall utilize materials that are consistent with the community theme and require limited maintenance. The fire pit will provide a focal point near the mixed-use residential area. Residents can gather and meet each other while enjoying a year-round amenity.
- The existing colour palettes that the Fireside community utilizes are warm earth tones mixed with vibrant fire tones that are distinctive to Fireside. Stage 2 will continue this colour palette.



The existing Fireside Architectural controls will be carried forward in Fireside Stage 2.

4.3 Land Use

The community of Fireside is designed to include the key elements of a complete community. One component of a complete community is provision for a variety of land uses within the community.

Below are listed the proposed land uses for the FS2NP.

4.3.1 Residential Use

The predominant Land Use within the FS2NP is residential. Residential use covers the largest area of space, 37.95 hectares (91.82 acres) of FS2NP area.

Residential development in FS2NP includes higher density (multi-family dwellings) as well as lower density (single and semi-detached dwellings and street-oriented townhouses) residential uses. The majority of the residential blocks within the FS2NP will utilize the Town's R-2 land use district which is a progressive land use district that permits single detached, semi-detached and townhouse dwellings to coexist on the same block. This integration will create a vibrant character through unique streetscapes. R-1 land use will be utilized along the north boundary of FS2NP to transition from the urban neighbourhood density of Fireside to the acreage lots in Rolling Range Estates to the north.

Consistent with Fireside Stage 1, Stage 2 incorporates a range of dwelling options to accommodate choice based on lifestyle requirements. Residents in various stages of life – single, young family, mature family, and empty nesters, each with varying income levels, will have the opportunity to find suitable accommodation in the community of Fireside.

Fireside Stage 2 provides a 0.92 hectare (2.27 acres) R-2 Residential site at the center of the neighbourhood with access to two main open spaces to the north and south. This site provides opportunities to offer local services to residents and to be included in a neighbourhood node.

4.3.2 Public Service Uses

The complete Public Service component of the FS2NP accounts for the second largest use of land (second to the residential component) and covers 11.12 hectares (27.48 acres).

The open space system provided in the FS2NP is designed to provide a range of open space needs and an efficient network for connecting residents to key features of the community, while providing terminating vistas and accessible parks spaces. Further information on how the open space system aids pedestrian connectivity can be found in Section 4.6

Included within this open space component are:

Municipal Reserve:

- One large central park to house a community fire pit and active play areas,
- Three neighbourhood parks to provide smaller scale play areas,

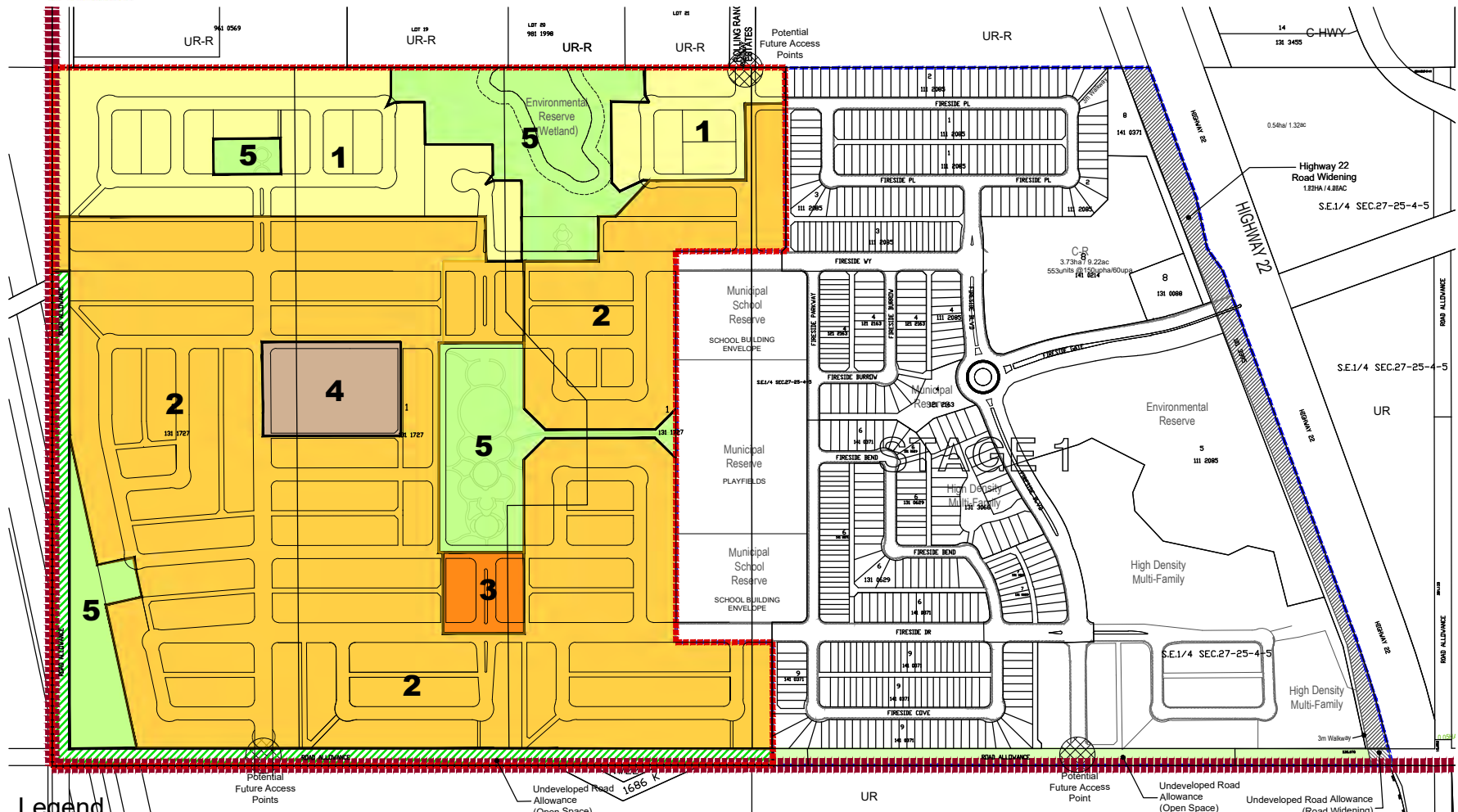
Environmental Reserve:

- A large environmental reserve is found in the north part of the FS2NP containing a Class IV and a Class II wetland, associated upland riparian areas as well as an existing tree stand.

Non-credit Open Space

- The Town's unopened road allowance along the south and west sides of the FS2NP area will be converted to a linear open space.
- The utility right-of-way located in the southwest portion of FS2NP will be utilized as an off-leash dog park.

The amount of credit Municipal Reserve dedicated with the FS2NP is less than the required 10% because a disproportionate amount of Municipal Reserve was dedicated within the FS1NP. The overall municipal reserve dedication for the entire community of Fireside will be 10.1% of net developable lands as required by the *Municipal Government Act* (MGA). See Table 2 in Section 5.0



FIRESIDE STAGE 2 LAND USE STATISTICS					Hectares	Acres
1	UR	TO	R-1		10.15	25.08
2	UR	TO	R-2		40.73	100.64
3	UR	TO	R-3		0.91	2.25
4	UR	TO	R-M		1.81	4.47
5	UR	TO	PS		8.75	21.62
	UR(Town land)	TO	PS		<u>2.86</u>	<u>7.07</u>
TOTAL					65.21	161.13

4.4 Design Elements

Design Elements are the elements of the FS2NP that are provided to create a better community. These elements may be built into the layout of the community to make it function more completely and more efficiently, or they may be subtle elements that provide opportunities for social interaction and the physical well-being of the residents. Regardless of their individual purpose, the design elements define the community and become the elements by which residents identify with.

4.4.1 Design Elements of the Residential Areas

Similar to the FS1NP, the FS2NP offers a variety of housing options including multi-family developments, townhouses, semi-detached dwellings, single family dwellings and secondary suites.

The majority of the FS2NP residential area is intended to utilize the Town of Cochrane's Residential Single and Two Dwelling District (R-2) which permits single detached housing, semi-detached housing and street-oriented townhouses to be built adjacent to one another on the same block. The R-2 land use district provides the opportunity to integrate the housing forms and to add variety to the streetscape. Accessory/garden suites are also available to increase the range of accommodations provided throughout the FS2NP. The vision is to use this integrated density to create an 'inner-city' urban style streetscape because residents may find single family housing located beside semi-detached or townhouses similar to what is seen in infill areas of larger municipalities. Every block could develop with a unique streetscape creating this 'inner city' style development within the community. In addition to the variety of housing forms, sidewalks on both sides of the streets, street trees and predominantly laned housing will add to the streetscape.

Larger lot single family dwellings will be provided along the north portion of the FS2NP, in Fireside Mount and Fireside Terrace, similar to the FS1NP to provide better transition to the acreage homes north of the plan area.

The majority of the residential blocks within the FS2NP have rear access through lanes. See Figure 4. Providing rear vehicular access to the residential units creates front streetscapes that are more pedestrian friendly because the rear lane eliminates the need for vehicles to cross the separated sidewalk for access to garages. Removing this crossing thereby eliminates

The FS2NP envisions a vibrant family friendly residential area that provides unique streetscapes through the integration of various housing forms.

the potential vehicle/pedestrian conflict resulting from cars exiting their driveways onto the collector roads. All of the residential units that front onto the collector road network in the FS2NP have rear lane access, with no direct access onto the collector roads.

The FS2NP includes one higher density multi-family site. This site is located in close proximity to the central park and neighbourhood node area. The higher density in this location will support local services that may exist in the area.

Decorative fencing will be provided at the entrance to Fireside from Tower's Trail to provide a sense of arrival into Fireside. The details and design of the fencing will be determined with the affected subdivision application.

4.4.2 The Neighbourhood Node

The Neighbourhood Node is located central to the FS2NP area. The node will contain the central park, which includes a play structure and public fire pit area as well as a local service in the form of a Daycare. The neighbourhood node offers the potential to become a destination point for residents meet and socialize. The public fire pit will be a year-round amenity that residents can enjoy, meet and socialize at.

4.4.3 Road Design

The FS2NP layout follows a modified grid design which reduces vehicular conflicts when compared to a traditional grid design. The difference between the two is that the modified grid provides some loops and crescents to minimize traffic short-cutting and eliminate unnecessary street intersections while a traditional grid has intersections at the end of each block.

The modified grid design of the community builds upon the Cochrane Sustainability Plan's 12th ***Pathway to the Future: There are diverse options for getting around.*** Not only does the modified grid design give vehicular traffic multiple routes to choose from, it also encourages walking and cycling in the community by providing short blocks and good sidewalk/pathway connectivity. Future residents may often find it more convenient to walk to their local destination rather than drive. Additional detail is provided under Section 4.5.

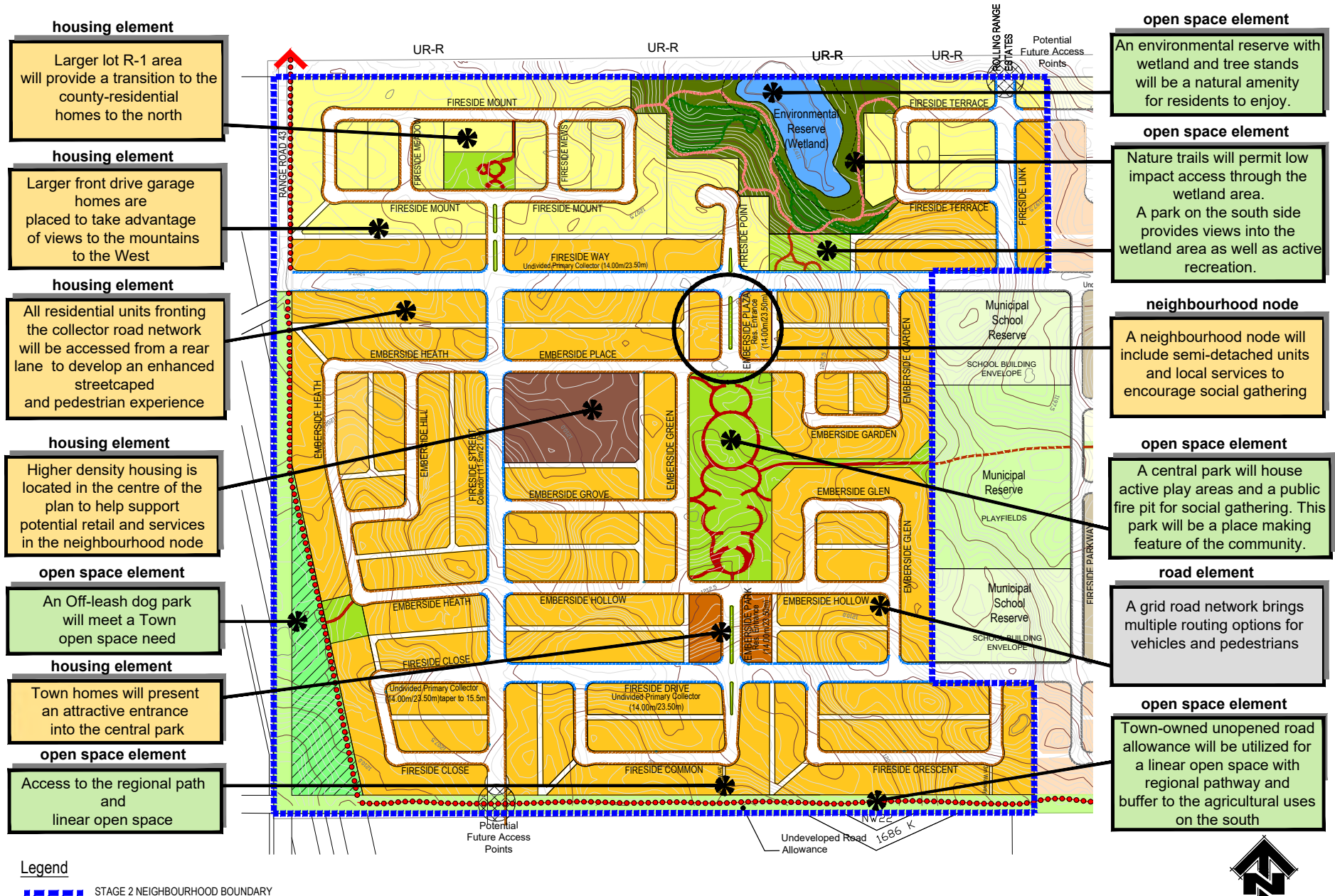


Figure 6:

KEY DESIGN ELEMENTS

4.4.5 North and South Boundary

To be consistent with the FS1NP, the developer will build a fence at the time of development to form the boundary between Fireside and the existing lands to the north and south. The fence on Fireside's north boundary will be a 6 foot wood screen fence, consistent with Fireside Stage 1. In addition, a rear yard tree planning program will be undertaken by the developer, for lots backing onto Rolling Range Estates, to provide additional screening.

The linear greenspace on the south side of the site, the current Town of Cochrane undeveloped road allowance, will include a 3.0m regional path as well as a 4 foot chain link fence with gates on the north side, and a 5 foot no-climb fence on the south side. A chain link fence with gates will ensure visibility and access into the linear greenspace to help uphold the CPTED principles of this area. This linear open space may be utilized as community recreation area connecting to the off-leash dog park, and provides a buffer to the agricultural use to the south. The 5 foot no-climb fence on the south side of the undeveloped road allowance will help ensure no trespassing or interference with the agricultural activities occurring to the south. Maintenance of the 5 foot no-climb fence will be the responsibility of the landowner to the south and west, and/or the Town of Cochrane as these are the two adjacent landowners to the fence. In addition, boundary signage will be provided by adjacent agricultural landowners stating "No Trespassing", and by the Town of Cochrane stating "Caution: Livestock at Large" to encourage residents of Fireside and the general public to remain within the limits of the greenspace.

Residential units on the north side of the FS2NP will be larger Single Family Units to provide a transition to the existing acreage homes. This type of residential unit will be ensured through an R-1 land use district designation.

4.4.6 Central Park

The central park space in the FS2NP is located near the centre of the FS2NP and will provide active play areas and a public fire pit for the community. The park is within walking distance to most residences. The fire pit is envisioned as a low maintenance pit and seating area that residents can enjoy year round.



4.4.7 Pipeline ROW & Off-Leash Dog Park

The land in the southwest portion of Fireside Stage 2 includes a utility ROW and makes up 3.65 acres of open space area. To meet a Town open space need as identified in the Recreation & Open Space Master Plan, this area is proposed to be used as an off-leash dog park. The site is well connected to the other open space areas within Fireside through the regional pathway that will be constructed in the Town's un-opened road allowance. Signage identifying the area as an off-leash dog park will be installed prior to the submission of the adjacent phases of subdivision. Should a need for parking to serve the dog park be identified, a location within the undeveloped road allowance would be suitable to fulfill this need.

Discussion has occurred with the pipeline operators to ensure compatibility of the proposed off-leash dog park. It was noted that any development, including home construction, within 30m of the pipeline ROW requires notification to the National Energy Board (NEB).

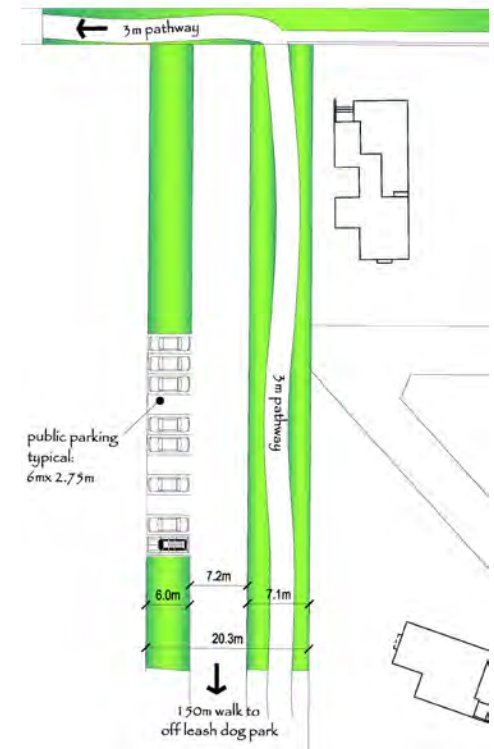
4.4.8 Environmental Reserve

One of the Town of Cochrane's Planning Principles is Environmental Stewardship. A step towards environmentally responsible development and Environmental Stewardship is provided through the retention of the high class wetlands in Fireside.

The FS2NP will protect a Class III wetland along the north boundary of the plan area, inside of a 3.45 hectare (8.52 acre) environmental reserve area. The environmental reserve will conserve the wetland, upland riparian area as well as a large tree stand. These natural features will enhance the open space system in Fireside. Once developed, the overall community of Fireside will include three natural wetlands and their associated riparian areas to complement the rest of the active & passive open space system.

Similar to the large wetland complex in the FS1NP, walking paths and places to relax and enjoy the outdoor environment will be part of the wetland enhancement design in the FS2NP. This will provide residents with passive recreation opportunities. Residents will be able to walk, run or cycle through the area, or just sit and enjoy the environmental reserve. Through the retention and enhancement of this existing wetland, Fireside is ***"building upon the strengths of our natural heritage"*** which is advocated through ***"Pathway to the Future: 13"*** in the Cochrane Sustainability Plan.

Figure 7: Example of Parking Option For Off-Leash Dog Park



4.5 Transportation Routes and Networks

The community of Fireside utilizes a modified grid pattern street layout. Section 4.4.4 highlights the benefits of a modified grid street layout over a traditional grid street layout.

The modified grid design provides vehicular traffic with multiple routes to choose from. It also provides short blocks and good sidewalk/pathway connectivity to encourage walking and cycling in the community as alternate forms of transportation to vehicles. Short blocks increase the connectivity of the street layout because there become multiple options for connecting to various different areas of the community. For the same reasons, short blocks increase the pedestrian connectivity as well. Future residents will often find it more convenient to walk to their local destination rather than drive. The internal street network is highlighted in Figure 8. The potential future transit route is identified in Figure 9.

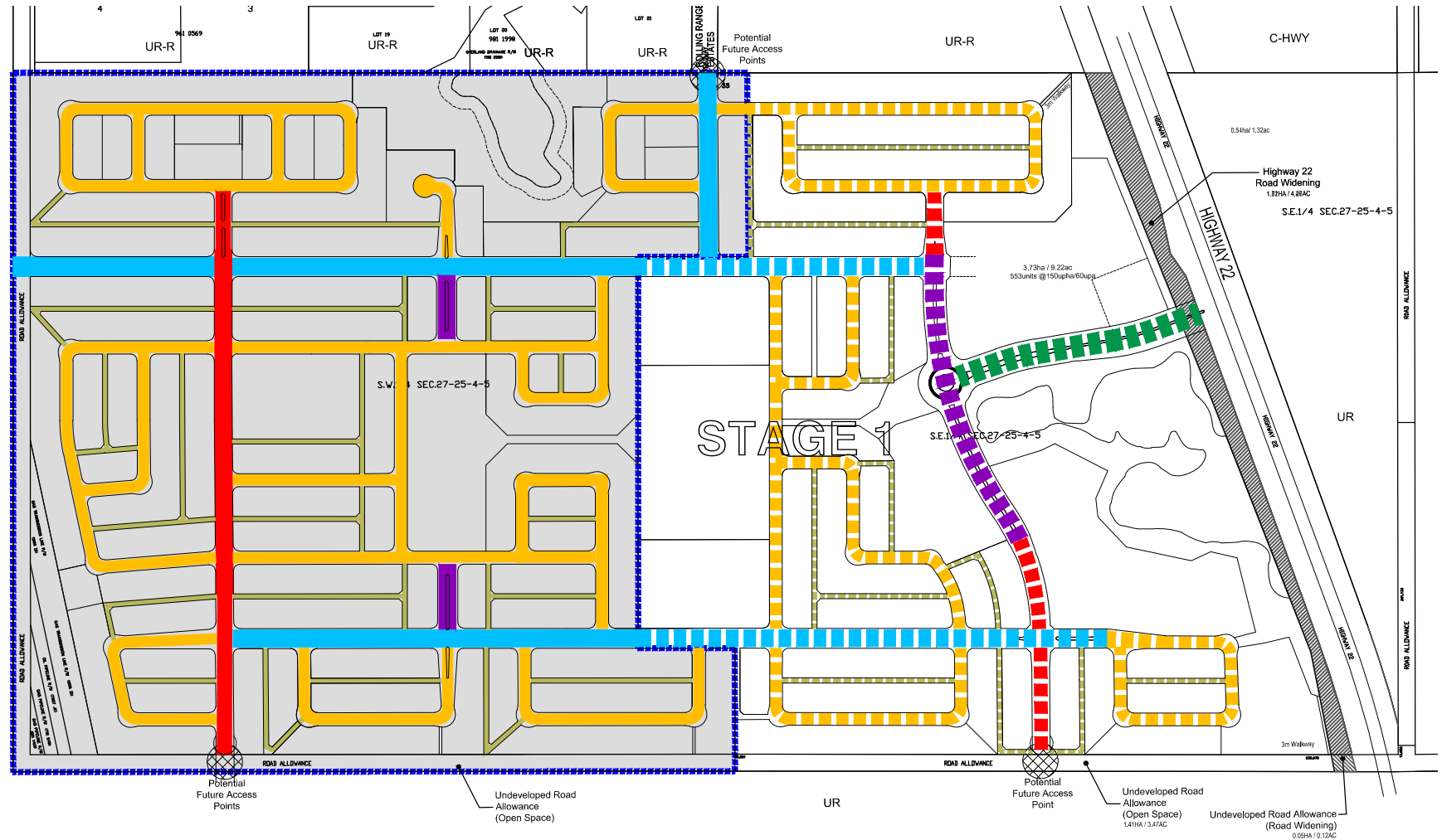
Sidewalks are placed on both sides of all of the streets within the community. The sidewalk network is complimented by a pathway system that will draw residents into the community's greenspaces. The pedestrian connectivity (network) is discussed in Section 4.6 and illustrated in Figure 10.

The potential future transit route is identified in Figure 9. This route is anticipated to operate in a counter clockwise direction to allow bus stops to be located on the same side of the street as the commercial-residential mixed use site and the school site(s).

All proposed roads rights of way are illustrated on Figure 8. All cross-sections will comply with Town of Cochrane standards unless otherwise noted. Should an alternate right of way be proposed, a cross section must be provided at the time of subdivision.

4.5.1 Permanent & Emergency Access Routes

The National Fire Protections Association require that areas with greater than 600 residential units provide two permanent accesses and one emergency access. The ultimate build-out of Fireside is anticipated to have 1382 units. Fireside is accessed from Highway 22 via Fireside Gate, which is a 4 lane major road with a dividing median. A second permanent access will be constructed to Towers Trail via Fireside Way. Once the community either reaches 600 occupied residential units, or at a date pre-agreed to between the developer and Town Administration, Fireside Way to Towers Trail will be designed and constructed to adhere to Town of Cochrane standards for a public roadway. Consideration will be given for an interim surface treatment until the ultimate road is constructed, should the access be required prior to adjacent phase development. The second public access is to be open and available to traffic exiting and entering the community.



Legend



STAGE 1 DIVIDED MAJOR



STAGE 1 PRIMARY COLLECTOR



STAGE 1 COLLECTOR



STAGE 1 RESIDENTIAL ROAD



STAGE 1 LANES



STAGE 2 NEIGHBOURHOOD PLAN BOUNDARY



RESIDENTIAL ENTRANCE



UNDIVIDED PRIMARY COLLECTOR



COLLECTOR



RESIDENTIAL STREET



LANES



Figure 8:
TRANSPORTATION NETWORK

The emergency access to and from the community is currently provided through a permanent, emergency-only road connection to the Rolling Range Estates development to the north. This will remain as an emergency-only access until re-development of Rolling Range Estates, or if the intersection of Highway 22 and Rolling Range Drive closes, in consultation with the Rolling Range Estates community.

TIA updates letters will be provided with each FS2NP subdivision application. The scope of these update letters are intended to assess and verify traffic volumes and will therefore focus on (a) undertaking counts at key locations to verify traffic volumes, and (b) undertake counts to verify occupied dwelling units and therefore trip generation rates for use in the assessment of approved but unoccupied units. The outcome of the letter will be to state whether or not upgrades, on-site or off-site, are required as a result of each stage or phase of development, based on the TIA letters. A baseline of Fireside traffic utilizing Tower's Trail will be established with the first Stage 2 subdivision application, and any Fireside traffic volume increases will be identified with each subsequent subdivision application. Tower's Trail has the ability to serve multiple communities on Cochrane's west side, and consideration should be made by the Town to add this road to the Town's list for regional road upgrades.

The TIA update letters accompanying the FS2NP subdivision applications will also indicate when the detailed signage and pavement markings are required to enhance the operation of the modified 2-lane traffic circle at Fireside Gate and Fireside Boulevard. The updates will reflect the condition at the time of the studies, and the terms of reference will be substantiated and confirmed with the Town.

4.6 *Pedestrian Oriented Development*

The FS2NP is a modified grid design providing short blocks, p-loops and well-connected pathways, walkways and sidewalks to offer the pedestrian easy access to the neighbourhood node and greenspaces for recreation and gathering. Figure 10 illustrates the pedestrian connectivity of the FS2NP and the pathways and sidewalks in place to facilitate comfort and convenience in the pedestrian environment.

The Town of Cochrane, in part, uses the City of Calgary Design Guidelines to determine road standards and cross section designs. As a standard design guideline, sidewalks are required on both sides of all residential and collector roads. Collector roads will have separated sidewalks, whereas residential roads will have monolithic sidewalks. Separated sidewalks purposefully maintain a more comfortable distance between the pedestrian and the motor vehicle. A separated sidewalk places the pedestrian several metres from the curb whereas a monolithic sidewalk is built directly adjacent to the curb. This separation results in greater pedestrian protection and allowing for a more relaxing walking experience as well as a more attractive streetscape.

Monolithic sidewalks will be constructed on both sides of all residential streets within the FS2NP area. These sidewalk widths will align with the wider sidewalks found in Town of Cochrane's new residential road standard.

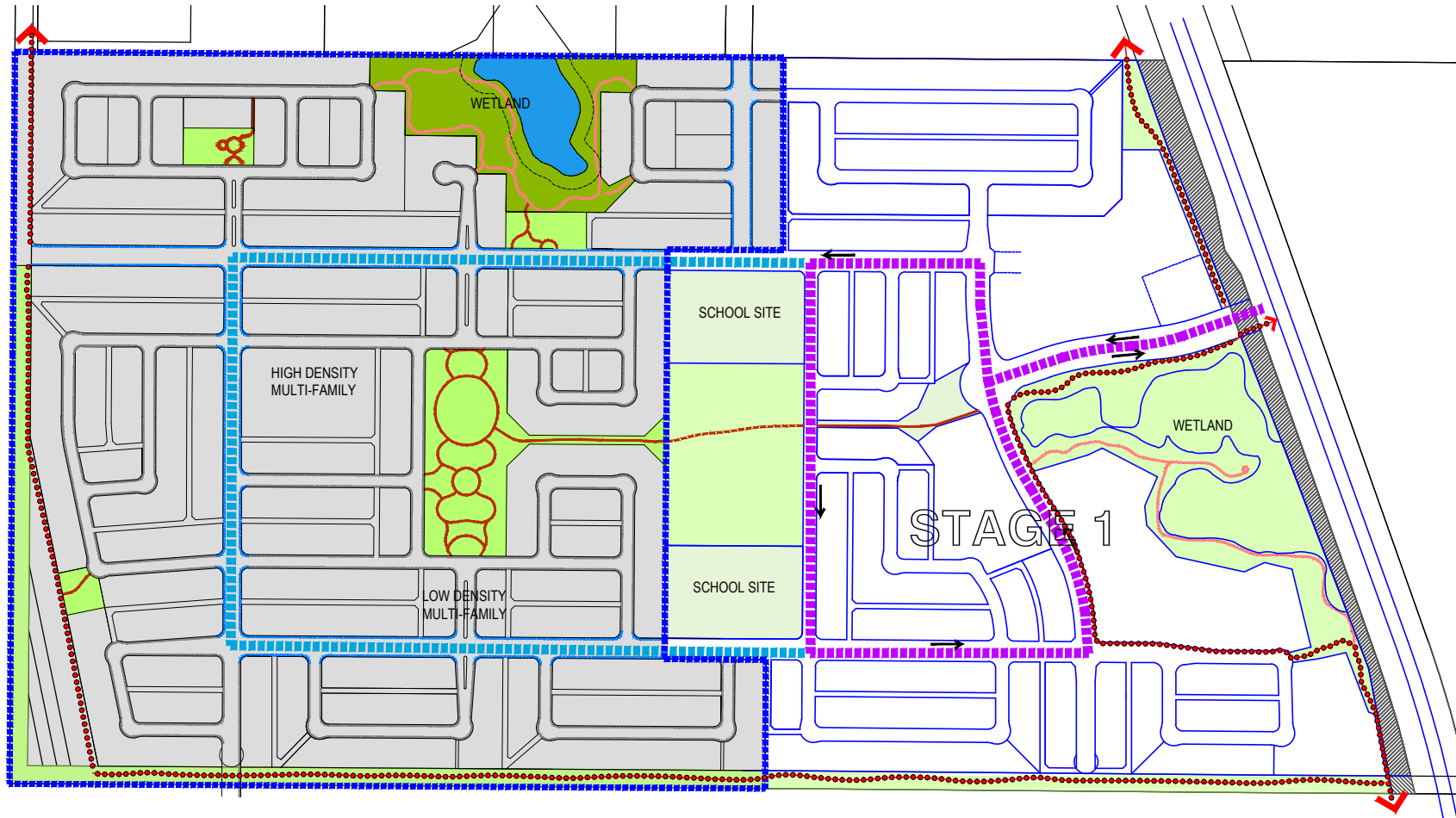
The pathway and sidewalk system bring pedestrians and cyclists directly to the commercial nodes and greenspaces located throughout the community. This ease of accessibility to the commercial area and neighbourhood node will allow them to flourish and become 'destination nodes' that will in turn foster the social development of the community. The types of pathways provided will vary throughout the community, and will align with the Cochrane Open Space Master Plan.

A range of 1.5m - 3.0m wide pathways, which will be asphalt surfaced in some locations and natural trail materials in others, provides multiple connections throughout the community. Where the local path exists within parks or the environmental reserve area, it will have a natural trail material surface to minimize environmental impacts. In locations where the local path provides a connection from a sidewalk through a walkway between houses, the surface will be asphalt to provide ease of maintenance. The local pathway connections are provided in key locations to reduce walking distances to the school site, and provide short-cuts where pedestrians would logically want them.

A potential local pathway connection has been identified through the playfields within the future school site. This is noted as potential as the alignment and feasibility must be discussed with the school board at the playfield design stage.

The FS2NP continues to incorporate the Town of Cochrane's undeveloped road allowance along the south and west boundaries, turning the right-of-way into a linear greenspace. The undeveloped road allowance runs along the south and west sides of the WR-ASP boundary and the Town of Cochrane boundary. The land will remain under the Town of Cochrane ownership. This linear greenspace will include the community's 3.0m regional pathway to further enhance the recreation and connectivity experience of Fireside. This linear open space will be utilized as a recreation area allowing residents to enjoy walking, jogging or biking.

The combination of the FS2NP's sidewalks, pathways, and linear greenspace connecting to multiple destination nodes, make Fireside a very walkable community. Whether pedestrians are walking to the school site, the feature park, through the naturalized stormwater management facility or to the local services, there will be multiple routes to get them there.

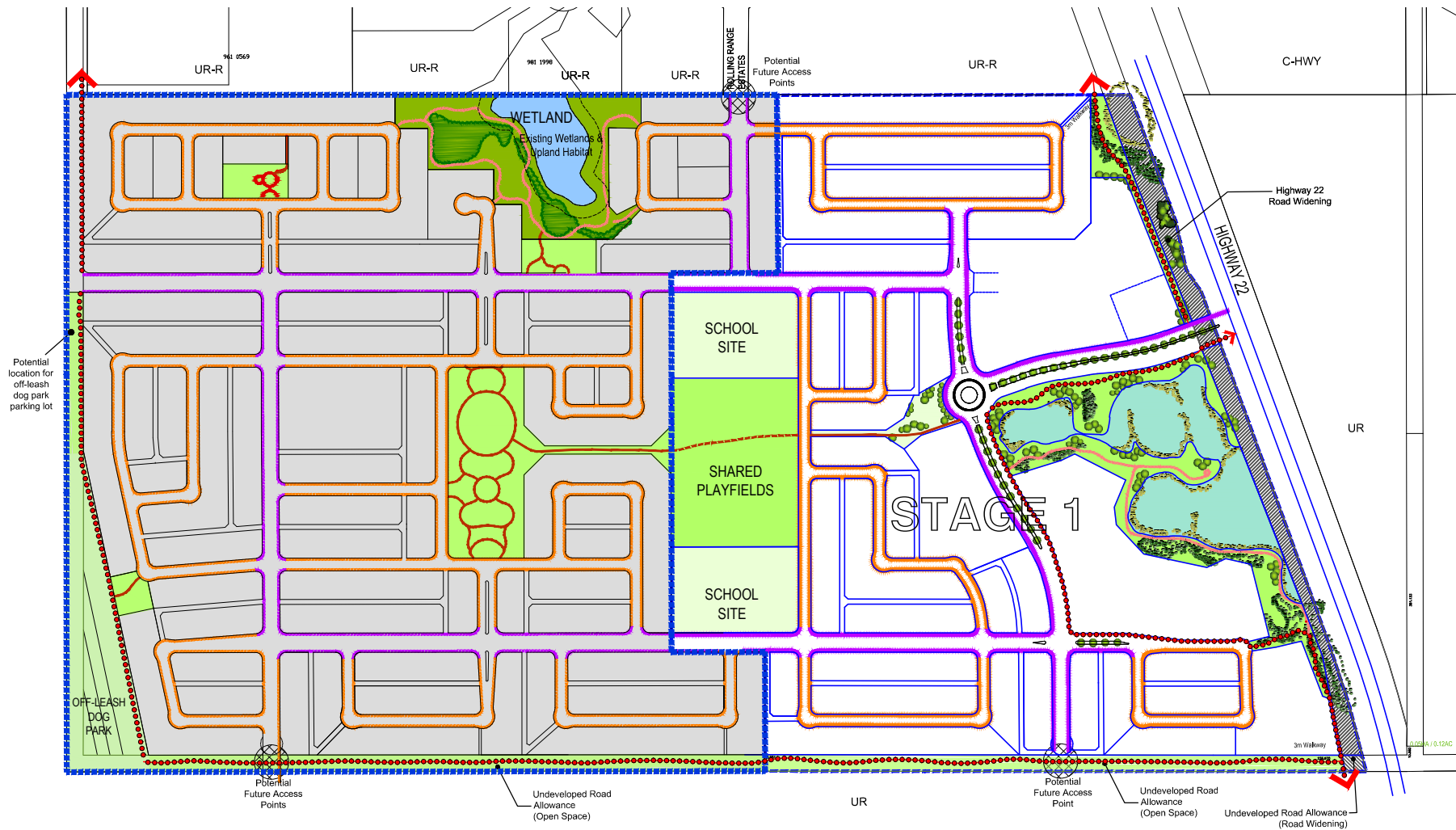


Legend

- STAGE 2 NEIGHBOURHOOD BOUNDARY
- POTENTIAL SCHOOL BUS ROUTE AS IDENTIFIED IN STAGE 1
- POTENTIAL FUTURE PUBLIC TRANSIT ROUTE



Figure 9:
POTENTIAL FUTURE BUS ROUTES



Legend

- | | | | |
|---|------------------------------------|--|-------------------|
| ---- | STAGE 2 NEIGHBOURHOOD BOUNDARY | ---- | SEPARATE SIDEWALK |
| ---- | REGIONAL PATHWAY | ---- | MONO SIDEWALK |
| ---- | LOCAL PATHWAY | ---- | NATURE TRAIL |
| ---- | POTENTIAL LOCAL PATHWAY CONNECTION | | |



Figure 10:
OPEN SPACE AND CONNECTIVITY PLAN

4.7 Crime Prevention through Environmental Design

Crime prevention through environmental design (CPTED) occurs where the built environment is designed in such a way as to reduce the predication of criminal activities and reduce the fear of crime occurring. The community of Fireside is conscious of safety through design and this is incorporated throughout the community.

The FS2NP central park has a single loaded road fronting the north, west and south side. Houses back onto the park on the east side, placing eyes directly onto the park. This openness allows for constant visibility into the site by residents from either adjacent sidewalks and/or homes and from vehicles passing by. The central park can also be accessed from the east via an open space linkage between the school playfields and the central park. This creates an alternate access point for both open spaces to help avoid entrapment.

The naturalized environmental reserve (ER) site is treed and could create feelings of isolation. This risk has been reduced by placing a municipal reserve (MR) area directly to the south of the ER area. The MR is open to the collector road on the south side, which will create visibility into the ER from the road. The MR will also attract more residents to the two open spaces; therefore greatly reduce the potential feelings of isolation that could occur within the ER area.

Chain link fencing with gates will be provided between private residential lots and the unopened road allowance along the south and southwest portions of the Plan area. This will permit visibility and access into this linear open space to avoid feelings of entrapment or isolation.

The social development of a community also provides an important element in crime prevention. The multiple nodes for community gathering, such as the parks and open spaces, the school sites and the public fire pit will foster the social development of the community. As the social development of the community grows, and residents get to know their neighbours, the overall sense of safety in the community will grow and residents will more likely report a crime or intervene to help.

The incorporation of short blocks within the street layout provides multiple route options for pedestrians, adding an additional element of safety as a pedestrian is less likely to find themselves in a situation with limited escape routes.

4.8 Housing Diversity, Streetscape and Architectural Development

The FS2NP will continue the diverse housing opportunities and streetscapes found in the FS1NP. Multiple housing options such as single family homes with attached garages, single family homes with detached garages, accessory and garden suites, semi-detached homes, duplexes, townhouses, and stacked multi-family condominiums are available in the community of Fireside.

Fireside utilizes land use designations as an important tool to help build diversity into its streetscapes. The land use designation that provides the greatest flexibility in the existing Town of Cochrane Land Use Bylaw is the R-2, Residential Single and Two-Dwelling District. This land use, as previously mentioned in Section 4.1.1, allows single detached houses, semi-detached houses and street oriented townhouses to co-exist within the same block, and under the same land use. This provides the opportunity for the developer and builders to provide the type of housing that residents want and to place it where desired. The R-2 land use district integrates diverse housing options resulting in interesting and unique streetscapes.

The future architectural controls for the FS2NP area are the same as what was approved for the FS1NP. Through the architectural controls, the First Nations theme is reflected throughout the entire community. This theme is enhanced through the colour palette which includes a contrast between warm earthy tones with vibrant 'fire' tones including shades of red, orange, yellow and amber. The natural stone and wood finishing materials (or materials designed to emulate these natural materials) on the houses add design details to further support the community theme.

Variations in the streetscape will occur through different housing forms existing side-by-side, varying front setbacks, a variety of lot widths and different housing heights all adhering to Fireside's architectural guidelines (which shall be submitted prior to development).

5.0 NEIGHBOURHOOD PLAN STATISTICS

Statistical detail of the FS2NP land uses and projected number of units for each land use category can be found in Table 1.

The percentages of each use presented in Table 1 are based on the Gross Developable Area. The Gross Developable Area is calculated by removing 'regional' land uses. The land uses removed from the Gross Developable Area calculations in the FS2NP statistics are the environmental reserve areas, and the Town of Cochrane undeveloped road allowance that is being included within the FS2NP as a linear greenspace amenity. Therefore the Gross Developable Area for the FS1NP is 57.56 hectares (142.22 acres).

Residential land use accounts for

65.9% of the Gross Developable Area. The residential land uses proposed are Residential Single Detached Dwelling District (R-1), Residential Single and Two-Dwelling District (R-2), Residential Multi-Unit Dwellings District (R-3), and High Density Multi-Dwelling District (R-M).

It is challenging to predict the number of dwelling units that will be provided within the R-2 District. The intent of this district is to allow for flexibility in housing choice by allowing for single detached, semi-detached and townhouses all within the same district, on the same residential block. The flexibility that is built into this land use district allows the market to guide how this area will develop and create interesting and unique streetscapes. The potential exists for the future residents of Fireside choose which form of housing they prefer, single detached dwelling, semi-detached dwelling or townhouse unit on any block within this residential area. Therefore, in calculating the anticipated units and densities required in Table 1, some assumptions had to be made. The 'anticipated' portions of the R-2 calculations assume that 50% of the future residents will choose a single family home, and 25% will choose a semi-detached dwelling, and 25% townhouse units. These anticipated percentages of unit counts are the maximum the developer would seek, therefore this same unit count is assumed to be the maximum number of units. This unit count is also represented in Table 1.

The other residential land uses are straight forward and utilize the maximum and minimum lot sizes or unit counts allowed under their respective land use district guidelines.

The remainder of the FS2NP consists of municipal reserve, 5.8%; and roadways and lanes, 28.3%. Municipal Reserve is less than the 10% because 15.4% of MR was provided in FS1NP. See Table 2 for overall MR statistics.

Table 1: Fireside Stage 2 Neighbourhood Plan Statistics

FIRESIDE STAGE 2 OUTLINE PLAN STATISTICS					Number of units	% of GDA
	frontage (m)	Hectares (+/-)	Acres (+/-)			
Total Land Area		65.21	161.13			
<i>Environmental Reserve</i>		3.38	8.35			
<i>Town of Cochrane - unopened Road Allowance</i>		2.31	5.71			
<i>Regional Public Utility ROW</i>		1.96	4.83			
Gross Developable Area (GDA)		57.56	142.22			100%
GENERAL LAND USES						
Residential		37.95	93.77			65.9%
Residential Single Detached Dwelling District (R-1)						
Ant./Max.Number of lots based on 9m lot width	2096	7.85	19.40		232	
Residential Single and Two -Dwelling District or Townhouse (R-2)						
Ant./Max Number of lots based on 50% singles (9m), 25% semi's (9m), 25% towns (5.5m)	7873	28.08	69.39		1043	
Low Density Mult-Dwelling District (R-3)						
Ant./Max.Number of lots based on 5.5m lot width	152	0.52	1.28		27	
High Density Mult-Dwelling District (R-M)						
Ant./Max. number of units based on 18 upa		1.5	3.71		66	
Municipal Reserve		3.34	8.25			5.8%
Roadways and Lanes		16.27	40.19			28.3%
Total number of units					1368	
Density						
	Anticipated				23.8 upha	9.6 upa

Table 2: Overall Fireside Municipal Reserve Dedication

Stage	Gross Developable Area		Total MR Owning		Total MR Provided		%
	<i>(ha)</i>	<i>(ac)</i>	<i>(ha)</i>	<i>(ac)</i>	<i>(ha)</i>	<i>(ac)</i>	
FS1NP	44.21	109.24	4.42	10.92	6.84	16.90	15.47%
FS2NP	57.56	141.88	5.76	14.19	3.34	8.25	5.80%
Total	101.77	251.12	10.18	25.11	10.18	25.15	10.00%

6.0 DENSITY

The anticipated density for the FS2NP is 23.8 units per hectare (9.6 units per acre). This density aligns with the target density of 19.8 to 24.7 units per hectare (8 to 10 units per acre) required in the WR-ASP and the minimum 19.8 units per hectare in the 2008 MDP.

The overall anticipated density of Fireside is 22.8 units per hectare (9.2 units per acre), see Table 3.

Table 3: Overall Fireside Density

Stage	Total Gross Developable Area		Units	Density	
	<i>(ha)</i>	<i>(ac)</i>		<i>(uph)</i>	<i>(upa)</i>
FS1NP	44.21	109.24	956	21.62	8.75
FS2NP	57.56	141.88	1368	23.77	9.64
Total	101.77	251.12	2324	22.84	9.25

7.0 UTILITY SERVICING

7.1 *Water Main Distribution*

The water distribution system for FS2NP will be supplied by extending existing water mains west into the development lands. The elevations of the Stage 2 lands are such that no booster station is required to service the remaining lands. The existing pressure zone within the Fireside community is 1170m to 1210m. All finished grade elevations on the lots will be specified below 1210m. The water distribution system will be designed according to City of Calgary Servicing Standards and Alberta Environment Standards and Guidelines.

7.2 *Sanitary Servicing*

Sanitary servicing of FS2NP will be provided by extending existing sanitary sewers west into the development lands. The existing sanitary mains in Fireside have capacity for this development. Gravity trunk sewers will extend west in the collector roadways and lateral sewers will branch off the trunks to service the local areas of the plan. The sanitary servicing will be designed according to City of Calgary Servicing Standards and Alberta Environment Standards and Guidelines.

7.3 *Stormwater Management*

Stormwater management for FS2NP will follow the Fireside Stage 1 - Cochrane Staged Master Drainage Plan prepared by LGN Consulting Engineering Ltd. (June 2010) and approved by the Town June 11 2010. This report provides the design basis for the overall drainage concept for Fireside and states the storm system and storm pond is sized to service an additional 120 ha of land to the southwest.

The storm water from the FS2NP will be managed with the existing storm pond that was constructed in Stage 1. The storm water being treated by this pond will be conveyed to the pond by the storm sewer (minor) and overland drainage (major) systems. This pond will treat the storm water to Alberta Environment Standards and will discharge the water at the approved release rate of 11.0 L/s/ha into the existing storm system that ultimately discharges the drainage into the Bow River. There is a wetland located along the north property line that will be conserved by directing some LID buffered surface drainage to the wetland to maintain a near natural hydrology as specified in the Staged Master Drainage Plan. The LID buffered drainage is the drainage coming off of the back of lots that will be directed through vegetated strips or swales, at a minimum 2% slope where possible, that allow the runoff to be filtered before it can enter the wetland. The specifics of the LID measures will be determined during the detailed engineering and landscaping design of the phase including the Environmental Reserve. This wetland will act as a large trap low and any excess flow will be directed into the minor system and drain through the existing storm pond. The design will be in accordance to the City of Calgary Servicing Standards and Alberta Environment Standards and guidelines.

Under pre-development conditions approximately 4.8ha of land north of Fireside drains into the wetland being preserved; post grading, this will increase to approximately 5.2ha. The Staged Master Drainage Plan did not account for any flows from the land north of Fireside however flows from undeveloped/acreage developments are normally in the range of 5 L/s/ha compared to post development conditions of 70 L/s/ha. The piping design and pond design in Fireside accounted for the ER surrounding the wetland discharging into the storm system at 70 L/s/ha which will more than account for the expected drainage from the 5.2 ha from Rolling Range Estates in the post development conditions.

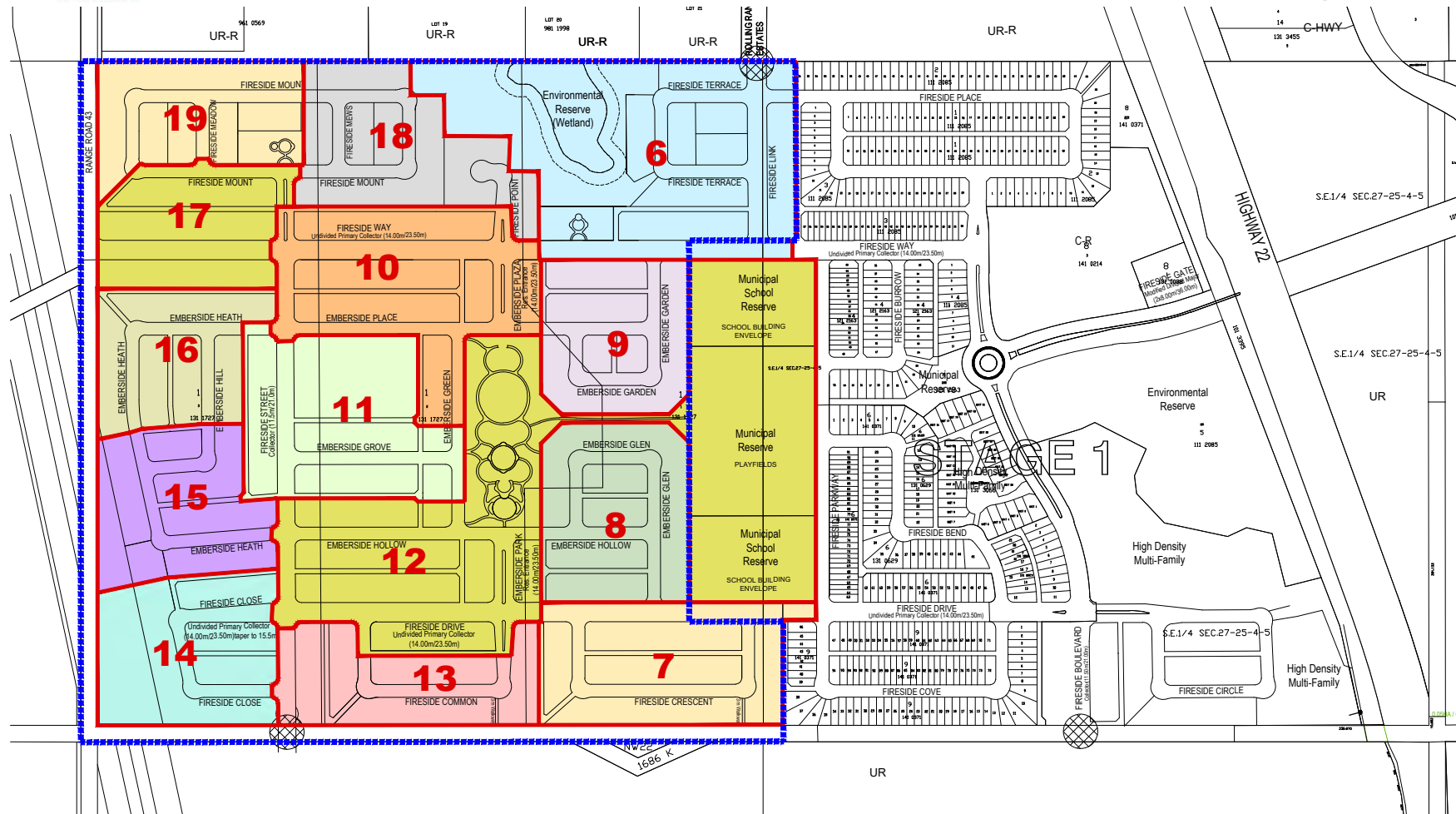
8.0 PHASING

Fireside Stage 2 will be developed in a phased manner. Figure 12 identifies the anticipated phase boundaries for FS2NP.

It is important to note that offsite development may occur with a particular Phase development to put utilities in place. This means that the engineering Phase boundary may not exactly coincide with the planning Phase boundary.



CONCEPTUAL UTILITY PLAN



Legend

■■■■■■■■ STAGE 2 NEIGHBOURHOOD PLAN BOUNDARY

■■■■■■■■ PHASING BOUNDARY



Figure 12:
PHASING

9.0 FIRESIDE WETLANDS

9.1 *Wetland Compensation*

The WR-ASP identifies a no-net-loss approach to wetland retention and provides a balanced approach to managing and conserving natural wetlands and their associated riparian lands within the context of urban development as per the Town of Cochrane Wetland Policy.

Sweetgrass Consultants Ltd. identified 43 wetlands within the gross developable WR-ASP area covering a cumulative area of 9.48ha (23.42 acres). The three most significant wetlands, as identified in the wetland inventory, within the WR-ASP area will be retained and new wetlands and appropriate adjacent upland habitat areas have been designed and constructed so as to compensate on a 1:1 area basis for wetlands that will not be retained. Much of the natural riparian areas surrounding the wetlands have been largely degraded through decades of cattle grazing. Reconstruction of these areas through wetland landscaping and transplanting of wetland materials is included in the wetland compensation considerations. A total of 6.44ha (15.91ac) of wetland and riparian area compensation was included in the FS1NP, with an additional 3.45ha (8.52ac) provided in Fireside Stage 2.



The environmental reserve (ER) area in the north portion of the FS2NP includes a Class III wetland, a small Class II wetland and their associated upland riparian area. This ER area is 3.45ha (8.52ac) in size, which is slightly greater than the 3.04ha (7.51ac) that was required to be dedicated with this stage to ensure the total 9.48 ha (23.42 ac) was provided to ensure the no-net loss of wetland area.

9.2 Wetland & Riparian Area Restoration & Enhancement

As part of Fireside's goal to balance urban development with environmental stewardship, Fireside became one of the first communities in Alberta to receive acknowledgement and compensation credit from Alberta Environment for the enhancement & creation of wetlands and riparian areas. As part of Fireside's no net loss of wetlands and associated riparian areas initiative, wetland materials (plants and soils) from wetlands deemed for removal are being transplanted to the wetland & riparian areas that are being conserved. This transplanting of native materials will help ensure the success of created wetland & riparian areas.



Sartwell's Sedge



Fireweed



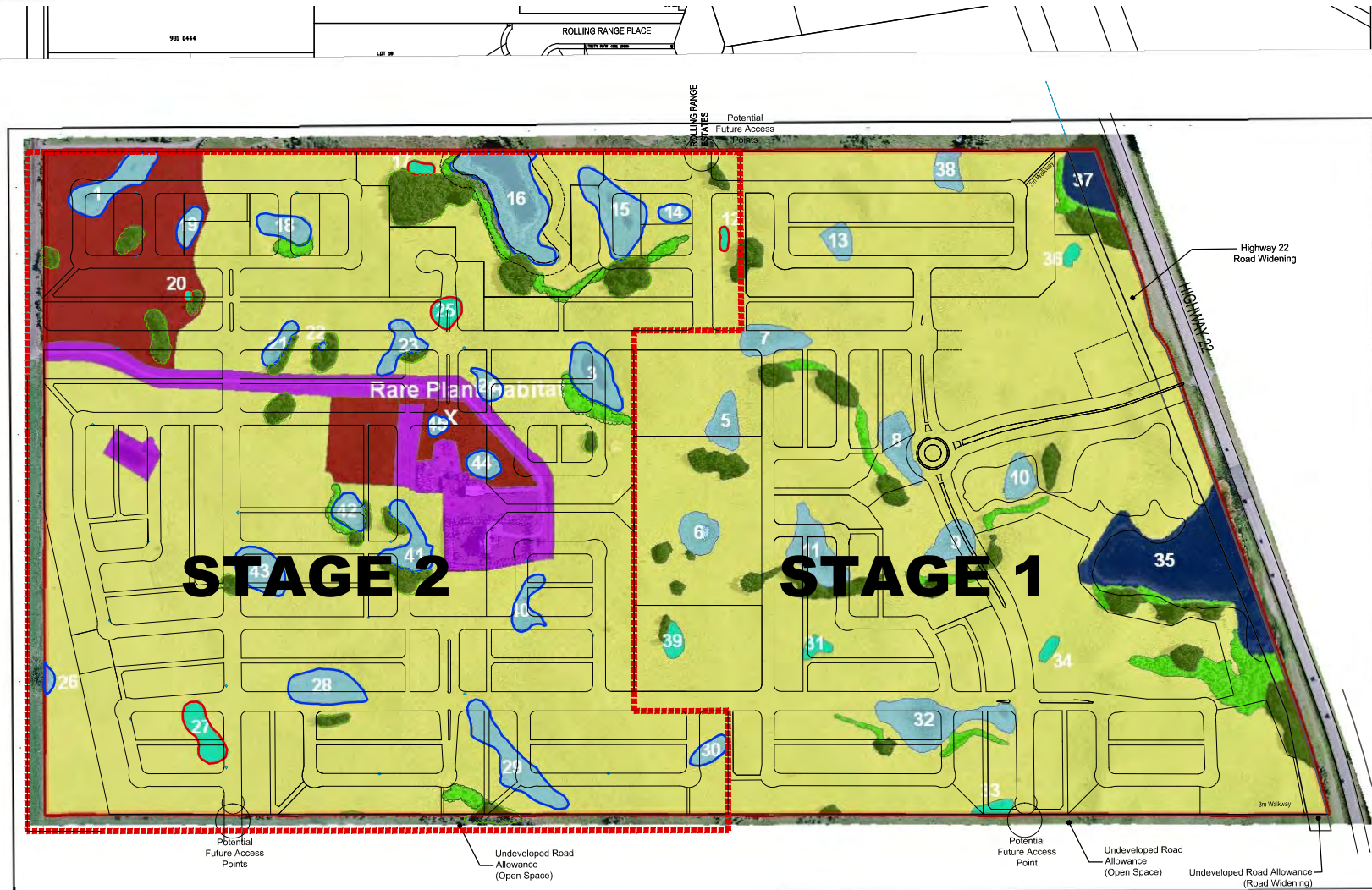
Duckweed

Table 4: Overall Fireside Wetland and Riparian Area Balance

Overall Fireside Wetland & Riparian Area Balance		
	ha	ac
43 Existing Cumulative Wetlands as per BIA	9.48	23.43
Fireside Stage 1		
North area retained	0.53	1.31
South area retained	<u>5.91</u>	<u>14.60</u>
Fireside Stage 2		
North area retained	3.45	8.52
Total Retained/Enhanced Wetland & Riparian Area	9.89	24.43
Net Gain of Wetland & Riparian Area	0.41	1.01

Figure 13: North Wetland & Setback Area





Legend

----- STAGE 2 NEIGHBOURHOOD PLAN BOUNDARY

 Native Grassland	 Deciduous Woodland	 Class IV Wetland	 Class III Wetland
 Non-Native Grassland	 Willow Shrubland	 Class II Wetland	 Disturbed



Figure 14:
HABITATS

10.0 MUNICIPAL ENVIRONMENTAL IMPACT STATEMENT (MEIS)

In accordance with Section 6.3.2 of the *Town of Cochrane Municipal Development Plan* a review of each of the factors contributing to the Municipal Environmental Impact Statement has been completed and outlined below. Further information can be found in the Geotechnical Evaluation by McIntosh Lalani Engineering Ltd.¹, the Historical Resources Impact Assessment by Historical Resource Management Ltd.³, the Westridge Biophysical Overview by Sweetgrass Consultants Ltd.⁴, and the Phase 1 Environmental Site Assessment by Base Property Consultants Ltd.⁶

a. Fish and Wildlife:

The findings of the Biophysical Overview state that the wildlife species found in the WR-ASP are generally widespread and common in southern Alberta, and the WR-ASP area is not an important wildlife corridor. The Sweetgrass Consultants Ltd. report indicates that the retention and enhancement of the Class IV wetlands will enhance habitat productivity for waterfowl and other wetland wildlife. All stormwater treatment and management facilities have been designed to provincial standards to ensure proper water treatment prior to entering into the Bow River thereby retaining appropriate water quality in the Bow River for fish and wildlife.

b. Vegetation:

The Biophysical Overview found that no federally or provincially listed species at risk were recorded within the WR-ASP and that habitat potential for these species is low. One provincially rare plant, blunt-leaved yellow cress, was found in a disturbed corral area in the central part of the WR-ASP. This rare plant will be relocated into the open space-wetland area as part of the FS2NP development.

c. Ecologically Significant Lands:

The only ecologically significant lands within the WR-ASP are the Class IV wetlands, as identified in the Biophysical Overview by Sweetgrass Consultants Ltd.⁴, which will be retained and enhanced. The wetlands include habitats for a variety of breeding and transient birds. Details on the wetland retention and enhancement can be found under Section 7.3.1.

d. Surface and Bedrock Geology:

The Geotechnical Evaluation performed by McIntosh Lalani states that the general subsurface stratigraphy of the WR-ASP consists of surface organic topsoil overlaying a veneer of silt and lacustrine clay deposits on top of glacial till soils which extend beyond the depth of drilling. Further details of the Geotechnical Evaluation can be found under Section 3.1.1.

e. Soils and Terrain:

A review of the Geotechnical Evaluation and the Phase 1 ESA found that organic topsoil consisting of clay, sand and rock, was encountered throughout the WR-ASP ranging in thickness from 75mm to 655mm. The WR-ASP contains land that is rolling and hummocky, with potholes dotted across the site.

f. Slopes:

There are no unstable slopes on the property. The lands are rolling and generally slope from the southwest to the northeast corners of the Fireside community.

g. Geotechnical Investigation:

A Geotechnical Investigation was prepared by McIntosh Lalani Engineering Ltd. and was submitted to the Town of Cochrane under separate cover during the WR-ASP application process. See Section 3.1.1 for further information.

h. Flood Potential and Proposals for Mitigation:

There are no floodway or flood fringe lands within the FS2NP.

i. Stormwater Study:

As noted above, further information can be found in the stormwater management concept for the FS2NP has been identified in the *Westridge Revised Master Drainage Plan* by LGN Consulting Engineering Ltd. (May 2009).

j. Water Quantity and Quality:

The stormwater management facilities proposed in the development have been designed to provincial standards to ensure release rates and water quality standards are met. Further information can be found in the *Westridge Revised Master Drainage Plan* by LGN Consulting Engineering Ltd. (May 2009).

k. Air Quality:

The FS1NP is predominantly a residential neighbourhood with an abundance of open space and wetlands. The design of the community is such that pedestrian and bicycle transportation are encouraged as an alternative to internal use of motor vehicles. Although any development that results in the removal of existing vegetation will have some impact on existing air quality, the long term effects when considering the replacement of many of the existing vegetation by developer landscaped areas and private landowner plantings, the development is not expected to result in any appreciable reduction in the current air quality.

l. Visual Resources:

The rolling terrain of the land and the existing wetlands are visually appealing. The proposed development realizes the opportunity to retain the existing uplands adjacent to the wetlands to enhance the existing Class IV wetlands. Views of the mountains can be seen from the northwest portion of the plan, as well as other areas.

m. Land and Resource Use:

Urban development, by nature, is an intensive form of development and will disturb most of the lands on which it is placed. The Fireside development looks to mitigate and minimize its use of the lands and on site natural resource by the following:

- Preservation of the Class IV wetlands as recommended in the Wetland Assessment⁵ prepared by Sweetgrass Consulting Ltd.,
- Relocation wetland materials from the less significant wetlands, where feasible, to help achieve a no net loss of wetland and upland riparian areas,
- Expansion of the large Class IV wetland is further accomplished through the integration of the stormwater management facility into the existing wetland.

The naturally occurring, on site water volumes are retained as a result of the measures taken and listed above. The irreplaceable environmental value of the wetland filtration system is not only preserved, but is enhanced.

The FS2NP proposes higher density urban development. Higher density developments provide residential accommodation to a greater amount of residents while utilizing less land. Through this means, the FS2NP is an environmentally responsible, high density community. Further details on the density provided in the FS2NP can be found under Section 6.0.

n. Cultural and Heritage Resources:

A Historical Resource Impact Assessment (HRIA) was prepared by Historical Resource Management Ltd. for the entire WS-ASP. The assessment indicated that no new archaeological sites were recorded, and no previously recorded sites were located on the lands. Based on the findings of the HRIA, clearance for the WS-ASP was given by Historical Resource Management, Alberta Culture and Community Spirit in a letter dated September 26, 2008.

o. Construction and Demolition Waste Management:

A construction and demolition waste management plan will be provided with each Subdivision application and Development Permit application to ensure proper procedures are followed at the time of construction.

11.0 SUSTAINABILITY

11.1 Planning Principles of the Sustainability Matrix

A Sustainability Matrix, as required by the MDP for new developments, was provided in detail for the WR-ASP. A copy of this letter is included as Appendix B. A brief summary of how the FS2NP continues to meet the five Planning Principles of the Sustainability Matrix is outlined below.

Principle 1: Responsible Growth Management

“Responsible growth management demands that the Town make every effort to meet the needs of a growing population, in an ecologically-aware and efficient manner, using limited natural, human, built, and financial resources”.

The FS2NP meets the Town’s Responsible Growth Management goals of accommodating a growing population in an efficient manner, by providing a new community with relatively high density, which is easily accessed by existing infrastructure.

The needs of a growing population are met by the community of Fireside through its provision of commercial development, institutional use provided through the inclusion of the two school sites, and areas for social interaction including parks and playfields. A variety of housing options will be available in FS2NP through a mix of townhouse development, semidetached, and single family dwellings, to accommodate the different life stages of future residents.

One of Fireside’s amenities is the naturalized stormwater management facility which will be integrated into the existing wetland. This integration will protect and enhance the natural ecology of the area by retaining the existing wetland and the adjacent vegetation in the associated upland area.

Principle 2: Social & Cultural Well Being

“Social well-being and a high quality of life is a reflection of living in a community that creates a safe, healthy, and comfortable environment in which to live, work and play.”

The FS2NP provides residents with a variety of residential housing forms and multiple opportunities for social interaction. Details of how the FS2NP achieves this is provided in Section 4.0

The layout of the FS2NP incorporates several elements of a pedestrian oriented development, as described further in Section 4.6. By accommodating pedestrian use, and providing areas for social interaction, including a neighbourhood node with a community fire pit, parks and open spaces, the safety of the community is increased through the active presence of its residents. This addresses one of the Crime Prevention Through Environmental Design (CPTED) principles. Further details of how the FS2NP addresses CPTED can be found in Section 4.8.

The parks and greenspaces provide recreational opportunity for residents. In addition, multiple pathways and walkways provide a variety of connection alternatives throughout the community, as expanded on in Section 4.6.

The FS2NP identifies a potential future transit route that minimizes impact on the community while providing direct access to the commercial-residential mixed use site, the neighbourhood node and the school site. Figure 9 illustrates this transit route.

Principle 3: Environmental Stewardship

“Environmental stewardship highlights the Town’s commitment to careful and responsible management of our natural resources and ecological assets”

The community of Fireside has conserved and is currently working to enhance the two permanent wetlands adjacent to Hwy 22, and the existing vegetation on the upland slopes adjacent to these. A naturalized stormwater facility has been integrated with the southernmost wetland to ensure its viability in the long term. By utilizing this existing wetland as part of the stormwater management solution for Fireside, portions of the naturally occurring drainage course will also be preserved. This is an adaptation of the natural drainage course to accommodate urban stormwater and demonstrates responsible management of this natural resource.

The stormwater facilities will filter the stormwater run-off before it enters pipes directing it from the community to the Bow River. The ultimate stormwater management wetland complex enhancement, in addition to the Stage 2 wetland & riparian area enhancement, will result in no-net loss of wetlands and riparian areas from the entire WS-ASP. The enhancement plan will be utilized to ensure a healthy future for the existing permanent wetlands, and the details of the project will provide an educational and open space amenity for the community. See Sections 4.4.7 and 7.3 for further details of the stormwater management facility and Section 7.3.1 for a discussion on wetland compensation.

By using pathway display boards throughout the naturalized stormwater management facility, the developer will inform residents as to how the stormwater management facilities are integrated with the existing wetlands, to provide an innovative solution to stormwater management and wetland enhancement, and help retain and protect the natural environment. The developer will not only design and build these naturalized facilities, but will help educate residents of the community as to how their community is ecologically responsible in its stormwater management.

Principle 4: Economic Vitality

“Economic vitality provides the foundation for a healthy, diverse, active, prosperous, and resilient economy.”

The overall community of Fireside will provide an attractive, complete residential community that will increase the Town’s population base which will support local business and encourage industries and new employers to base themselves in Cochrane. Fireside is a complete community because it will provide commercial uses, including retail, business and personal services, educational uses through the two school sites, and recreational uses in its parks and open spaces.

The location of the commercial site within FS1NP is such that it will be visible from Hwy 22, which will increase the market from which it will draw and thereby increase the vitality of the site.

The high residential density proposed throughout Fireside, along with the diverse variety of accommodations suitable to a range of income levels, will aid in the sustainability of the proposed commercial element of this community, and its resiliency in varying market conditions.

The walkability of the Fireside community will encourage an active community, which will draw residents to the commercial nodes as a destination point, further enhancing the prosperity of the sites.

Principle 5: Community Engagement

“Community engagement builds trust, ensures accountability, and improves the quality of decision making as the public plays a valuable role in formulation plans and developing services.”

The developer of the FS2NP will host two open houses to inform residents and adjacent land owners of the FS2NP prior to the plan being presented to Council. In addition, several meetings were held with adjacent landowners to help identify the needs and concerns of the existing neighbours to Fireside.

11.2 The Cochrane Sustainability Plan

The *Cochrane Sustainability Plan* (CSP) was developed by various Cochrane Action Groups made up of residents from the Town and then adopted by the Town Council in May 2009. The CSP provides thirteen (13) “Pathways to the Future” that can be used to guide development to ensure sustainability for Cochrane’s future. The discussion below outlines how FS1NP meets these Pathways to the Future.

The community of Fireside encourages social interaction through the design of the community. This social interaction is supported by creating a highly walkable community with multiple destination nodes for gathering. Whether it is at the future schools’ site(s), within the local commercial areas, or in the community greenspaces, residents will have the opportunity to get to know their neighbours. As residents come to know each other, they will begin to feel greater connection to their community and in turn their community involvement will increase. Increased community involvement could be achieved through local volunteering or providing support through participation in community events. The CSP ***Pathway to the Future 1: We are a socially responsible and empowered community*** and ***Pathway to the Future 8: We are a caring community that lives and celebrates together*** are supported by providing a community where social interaction is highly encouraged through design.

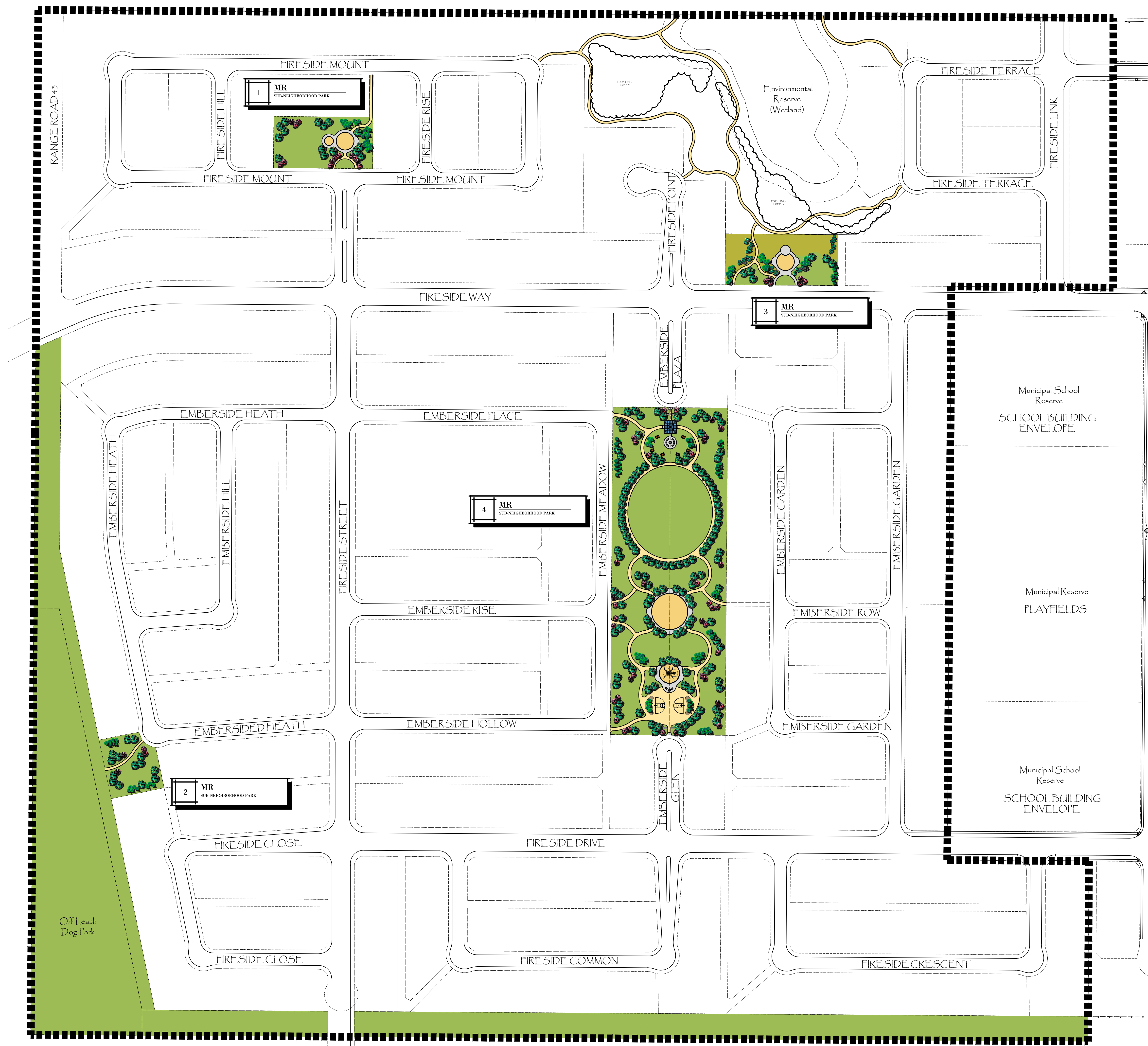
The innovative design providing the enhancement of the natural wetlands to operate as a stormwater management facility is a key element of the Fireside community, and also addresses some of the Pathways to the Future within the CSP. The design of the stormwater management facility includes utilizing the existing wetlands to provide natural filtration and treatment of the stormwater prior to it ultimately entering the Bow River. This natural pre-treatment of the stormwater results in less utility infrastructure required to be built for cleansing and treating of the water, and therefore reduces the impact on the environment as extensive land form modification is avoided. The enhancement of the FS2NP wetland will also protect the existing vegetation and create a naturalized habitat for wetland species. The final result will be the protection of natural wetland areas including vegetation and wildlife habitats, less demand on underground infrastructure, and the enhancement of the existing wetlands for residents to enjoy throughout the community. This innovative method of stormwater management puts Fireside on the path toward the **CSP goal of being “Responsible Citizens of the Planet”**, and meets the ***Pathway to the Future 2: We treat water as a precious resource***, ***Pathway to the Future 3: We use energy responsibly and innovatively***, and ***Pathway to the Future 4: We contribute to the solution on climate change***. More information on the stormwater management and wetland retention can be found in Section 8.

The overall community of Fireside is an efficiently planned community and provides multiple amenities for future residents. With two potential school sites, Fireside will be a community that provides jobs, education, and sporting activities within easy walking distance to the majority of the residences within the community. The extensive sidewalk and pathway system is well-connected and integrated throughout the community providing residents with multiple options to get around or just enjoy a leisurely walk. The centrally placed school sites, local commercial, and community greenspaces are located short walking distances from all dwelling units. These elements and features of Fireside support many of the CSP's Pathways to the Future including the ***Pathway to the Future 5: We consume the bounty of our local economy, Pathway to the Future 6: our local economy is healthy and diverse, Pathway to the Future 7: Everyone has an opportunity to pursue their potential in Cochrane, Pathway to the Future 10: There is enough room for everything a community should have, Pathway to the Future 11: Wherever you are in Cochrane, you're close and connected, and Pathway to the Future 12: There are diverse options for getting around.*** More information on the design elements of the community can be found in Section 4.4.

By providing a large variety of housing options, Fireside meets the Cochrane Sustainability Plan's ***Pathway to the Future 9: Everyone has a roof over their head.*** Front drive garage single family dwellings, laned single family dwellings, semi-detached dwellings, townhouse units, higher density multi-family units, commercial-residential mixed use areas and affordable housing will all be developed in the community of Fireside. More information on the range of housing available can be found in Section 4.4

The Fireside community theme takes inspiration from cultural influences of the Plains First Nations People. Architectural controls, building materials, and community colour themes will reflect the warm earth tones and vibrant fire tones that are inspired by the culture of the Plains First Nations People. The protection and enhancement of the natural wetlands is also a design element that supports our natural and cultural heritage. Protection and respect for the environment was an important aspect of life to our Indigenous Peoples. Through these elements Fireside meets the Sustainability Plan's ***Pathway to the Future 13: We build Cochrane on the strength of our natural and cultural heritage.***

APPENDIX A: Municipal Reserve Concept Plans



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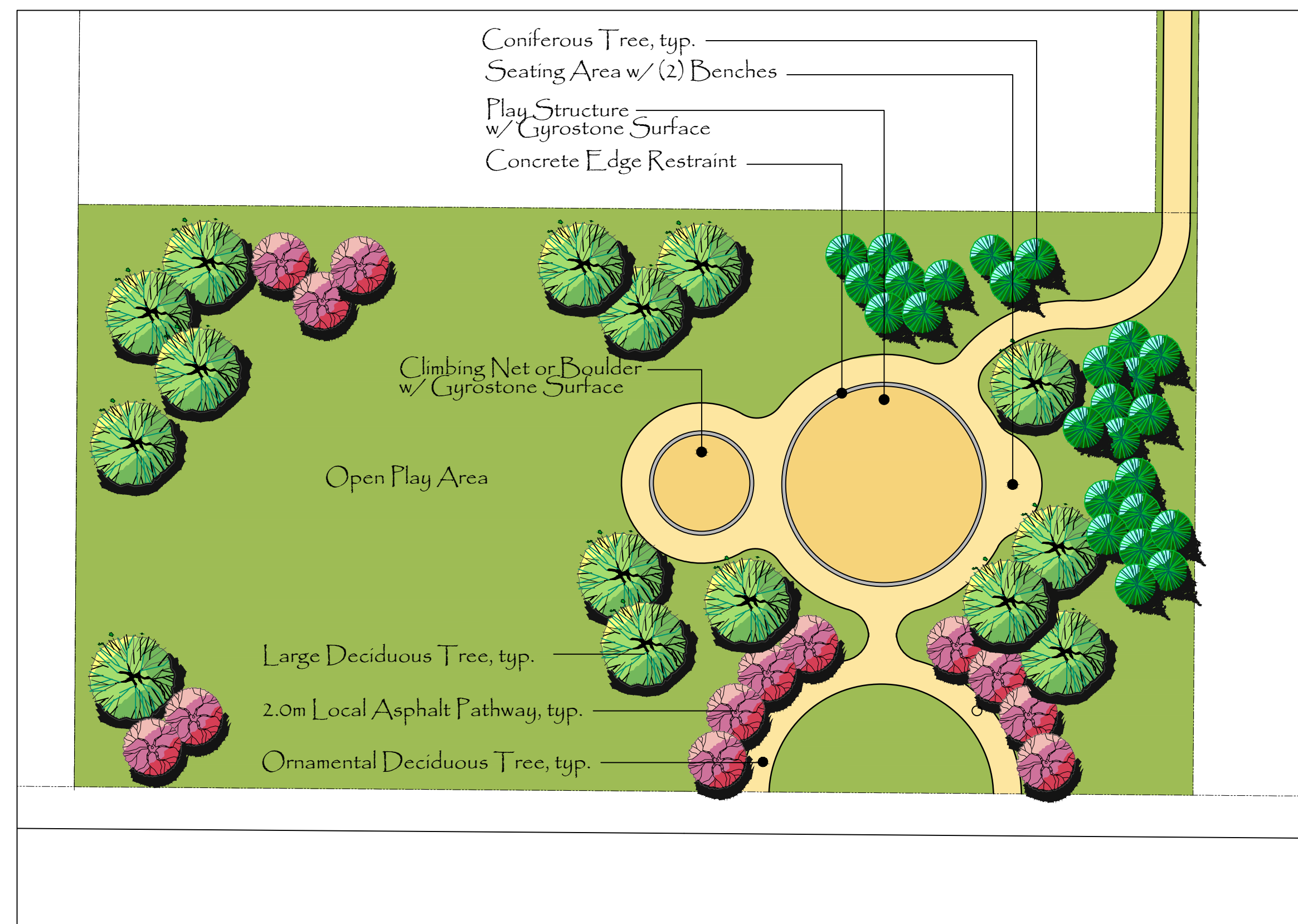


FIRESIDE STAGE 2 LANDSCAPE CONCEPTS TOWN OF COCHRANE, ALBERTA

LA VITA LAND INC.
MAY 2013



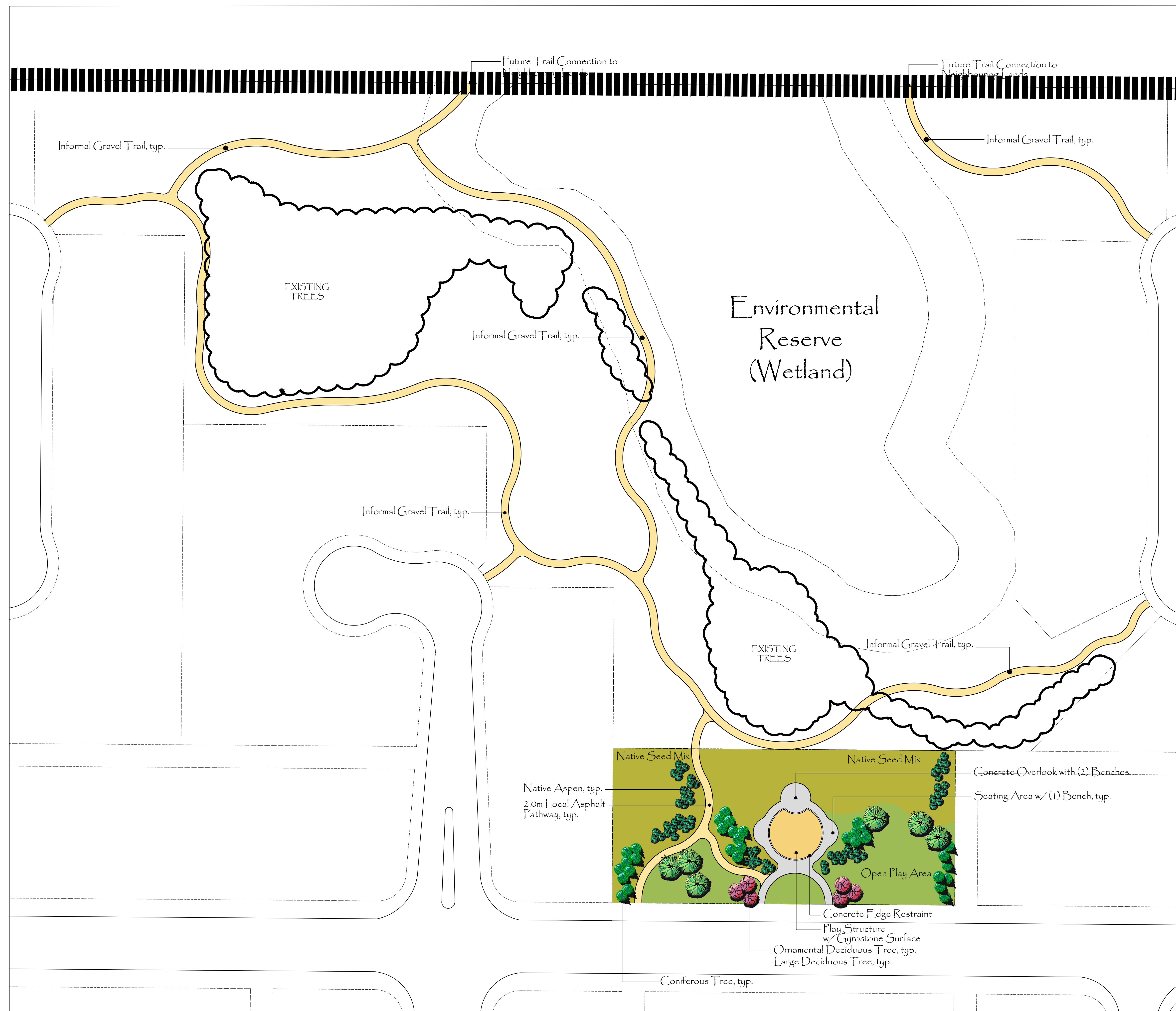
KEY
PLAN



1 MR 1:300



2 MR 1:300

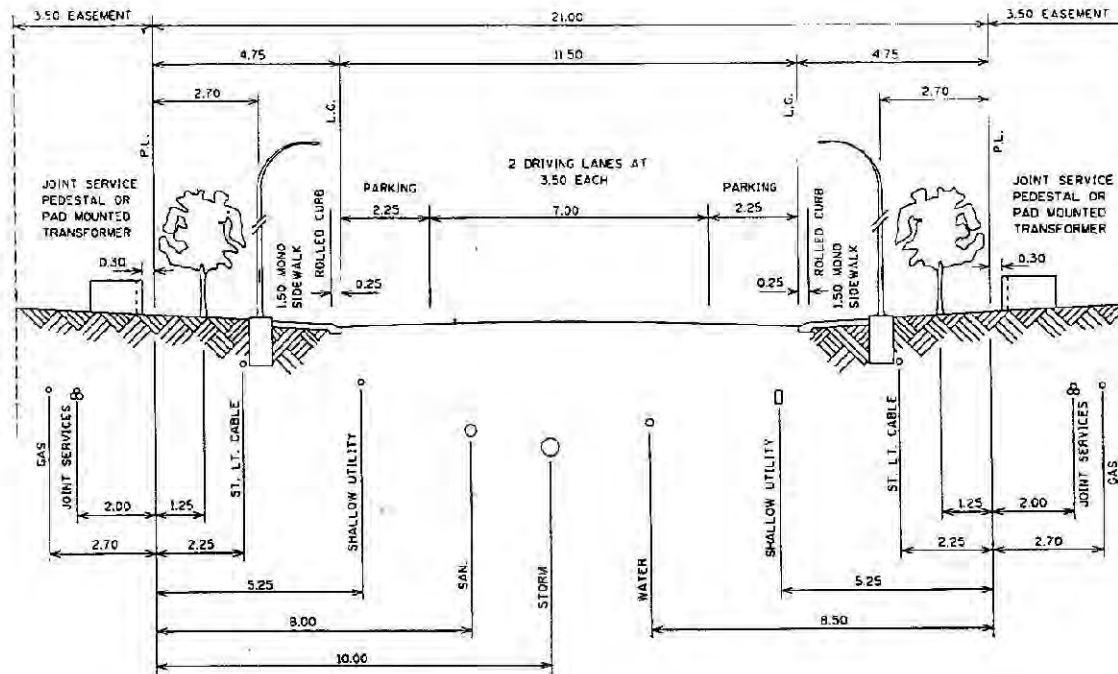


3 MR AND ER 1:500





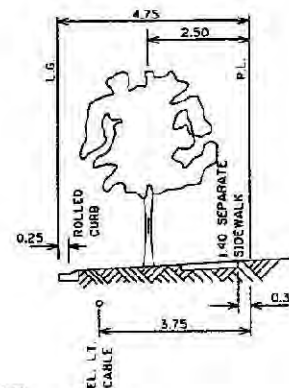
APPENDIX B: Fireside Street 21.0m Collector Cross Section



- NOTE:
- HYDRANTS ON 2.00 LINE.
 - HYDRANT VALVES ON 7.50 LINE.
 - SERVICE VALVES ON 1.25 LINE.
 - TREES ON 1.25 LINE.
 - PRE-INSTALLED SERVICE CONNECTIONS TO BE INSTALLED 3.50m INSIDE P.L. OR 5.00m INSIDE THE P.L. WHEN CROSSING GAS AND ONE OTHER SHALLOW UTILITY.
 - HYDRANT & SERVICE VALVES SHALL MAINTAIN A MIN. 2.50 SEPARATION TO THE CENTRE LINE OF POWER POLES & STREET LIGHTING POLES.
 - HYDRANT & SERVICE VALVES SHALL MAINTAIN A MIN. 3.00 SEPARATION TO THE EDGE OF TRANSFORMER, PULL BOX / JUNCTION TERMINALS & OTHER SURFACE STRUCTURES.
 - ADDITIONAL SEPARATION MAY BE REQUIRED BETWEEN STORM & SANITARY SEWERS IF EXCESSIVE VERTICAL DIFFERENCE OCCURS.
 - SERVICE VALVES FOR HYDRANTS LOCATED ON THE OPPOSITE SIDE OF ROAD FROM THE WATER LINE TO BE PLACED 9.5m FROM P.L. (11.0m FROM WATER LINE).

ALTERNATIVE WITH SEPARATE SIDEWALK

- SERVICE VALVES ON 2.50m LINE.



- ENVIRONMENTAL CAPACITY 5,000 VEHICLES PER DAY

APPENDIX C: Water Act Approval

**APPROVAL
PROVINCE OF ALBERTA
WATER ACT, R.S.A. 2000, c. W-3, as amended**

APPROVAL NO.: 00289506-00-00

FILE NO.: 00289506

WATERBODY: Wetlands

ACTIVITY LOCATION: SE 27-25-4-W5M; SW 27-25-4-W5M

EFFECTIVE DATE: August 8, 2011

EXPIRY DATE: August 7, 2021

APPROVAL HOLDER: La Vita Land Inc.

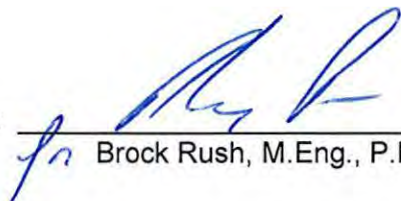
Pursuant to the Water Act, R.S.A. 2000, c. W-3, as amended, an Approval is issued to the Approval Holder for the following activity:

disturbing/altering a total of 6.3 ha of wetlands; and

constructing wetland enhancements;

subject to the attached terms and conditions.

Designated Director under the Act:


Brock Rush, M.Eng., P.Eng.

Date Signed: August 8, 2011

DEFINITIONS

- 1.0 All definitions from the Act and the Regulations apply except where expressly defined in this Approval.
- 1.1 In all parts of this Approval:
- (a) "Act" means the Water Act, RSA 2000, c. W-3, as amended;
 - (b) "Director" means an employee of the Government of Alberta designated as a Director under the Act;
 - (c) "Maintenance" means the routine repair, upkeep and preservation of the activity authorized under this approval; and
 - (d) "Regulations" means the regulations, as amended, enacted under the authority of the Act.

GENERAL

- 2.0 The Approval Holder shall immediately report to the Director by telephone, any contravention of the terms and conditions of this Approval at (780) 422-4505.
- 2.1 The terms and conditions of this Approval are severable. If any term or condition of this Approval is held invalid, the application of such term or condition to other circumstances and the remainder of this Approval shall not be affected thereby.
- 2.2 The Approval Holder shall retain a copy of:
- (a) this Approval; and
 - (b) the reports referred to in Section 3.2
- at the site of the activity at all times while conducting the activity.

PARTICULARS

- 3.0 This Approval is appurtenant to the undertaking as described as the wetland enhancements and disturbance located at SE 27-25-4-W5M and SW 27-25-4-W5M as shown in Report Nos. 00289506– R001, 00289506– R002 and 00289506– R003.
- 3.1 The disturbance and enhancement activities authorized under this Approval shall be completed by August 7, 2016.

- 3.2 The Approval Holder shall undertake the activity in accordance with the following reports:

TITLE	AENV NUMBER
Fireside Wetland Impact Assessment Prepared by C. Wershler, P.Biol., Sweetgrass Consultants Ltd. Dated March, 2011.	00289506- R001
Wetland Conservation Plan Rationale. Prepared by <i>Riparia</i> Ltd. Dated March, 2011.	00289506- R002
Letter & Eight Appendices addressed to: Robert Simieritsch, Re: Fireside Cochrane. From Bernie Amell, Riparia Ltd. Dated 15 June, 2011	00289506- R003

- 3.3 The Approval Holder shall not undertake the activity in any manner or use any material that causes or may cause an adverse effect on the aquatic environment, human health or public safety.
- 3.4 The Approval Holder shall not release water affected by the activity to any water body unless the quality of water is equal to or better than the quality of water in the receiving water body.
- 3.5 In order to avoid impacts during nesting season, the Approval Holder shall not conduct any activities in the wetland between April 1 and July 15, unless the area has been assessed by a Qualified Wildlife Biologist and there are no nests or avian young present.
- 3.6 The Approval Holder shall minimize the removal or disturbance of existing vegetation at the site of the activity.

SILTATION AND EROSION CONTROL

- 4.0 The Approval Holder shall minimize:
- (a) siltation; and
 - (b) erosion
- of the water body as a result of the activity.

WETLAND MITIGATION

- 5.0 The Approval Holder shall conduct mitigation as stipulated in the Report Nos. 00289506-R001, 00289506-R002, and 00289506-R003 or as otherwise authorized in writing by the Director.

- 5.1 The Approval Holder shall develop and implement an access management plan to control and minimize the impact of human access on restored and enhanced habitat within and adjacent to wetlands in the Fireside development.
- 5.2 The Approval Holder shall develop and implement a weed management plan for restored and enhanced habitats in the Fireside development.
- 5.3 The Approval Holder shall submit "as-built" plan(s) of the constructed mitigation to the Director within 6 months following completion of the construction of the mitigation.
- 5.4 The Director reserves the right to amend this Approval to:
 - (a) amend any term or condition of the Approval;
 - (b) add a term or condition to the Approval; or
 - (c) delete a term or condition from the Approval,regarding further mitigation or compensation for the loss of wetland where, in the Director's opinion, the mitigation has not been successful.

WETLAND COMPENSATION

- 6.0 The Approval Holder shall provide compensation for the loss of wetland as stipulated in the "Wetland Loss Compensation – Fireside" agreement/letter, dated June 22, 2011, such that the Approval Holder shall pay financial compensation in the amount of \$168,000 to Ducks Unlimited Canada.
- 6.1 On or before December 31, 2011, the Approval Holder shall provide to the Director written confirmation from Ducks Unlimited Canada, that the compensation has been received.

MONITORING AND REPORTING

- 7.0 On or before December 31, 2011, the Approval Holder shall submit a Monitoring Program Proposal to the Director.
- 7.1 The Monitoring Program Proposal shall include, at a minimum, the following information:
 - (a) measurable wetland objectives for the constructed mitigation, the rationale for the objectives and proposed timelines to meet these objectives;
 - (b) a list of parameters to be monitored and the monitoring frequency for each;
 - (c) a rationale for the proposed Monitoring Program;
 - (d) identification of the boundaries for the Monitoring Program;

- (e) a plan showing the location of sampling and monitoring points;
 - (f) length of monitoring period (minimum five years);
 - (g) a description of the monitoring, sampling and analytical procedures; and
 - (h) any other information requested in writing by the Director.
- 7.2 If the Monitoring Program Proposal is found deficient by the Director, the Approval Holder shall correct all of the deficiencies:
- (a) as specified in writing by the Director; and
 - (b) within the time specified in writing by the Director.
- 7.3 The Approval Holder shall implement the Monitoring Program Proposal as authorized in writing by the Director.
- 7.4 The Approval Holder shall compile an Annual Monitoring Program Summary Report for each calendar year.
- 7.5 The Annual Monitoring Program Summary Report shall include, at a minimum, the following information:
- (a) the results of the monitoring and sampling as required in the Monitoring Program Proposal;
 - (b) interpretation of all data collected since the last reporting period, including an assessment of any trends;
 - (c) an assessment of the progress toward the wetland objectives and timelines to meet these objectives;
 - (d) any proposed modifications to the Monitoring Program Proposal, including rationale for the modifications; and
 - (e) any other information requested in writing by the Director.
- 7.6 The Approval Holder shall submit an Annual Monitoring Program Summary Report to the Director:
- (a) on or before February 28th of each year following the calendar year in which the information on which the report is based was collected; or
 - (b) within a time period specified in writing by the Director.

7.7 The Director reserves the right to:

- (a) amend any term or condition of the Approval;
- (b) add a term or condition to the Approval; or
- (c) delete a term or condition from the Approval

based on the results of the Annual Monitoring Program Summary Report conducted by the Approval Holder.

CERTIFICATE OF COMPLETION

8.0 Within 90 days following completion of the activity, the Approval Holder shall submit to the Director, a Certificate of Completion.

8.1 The Certificate of Completion shall include:

- (a) a statement that the activity has been completed in accordance with the Approval; and
- (b) any other information requested in writing by the Director.

Date Signed: August 8, 2011

A handwritten signature in blue ink, appearing to read 'B. Rush', is written over a horizontal line.

Designated Director under the Act
Brock Rush, M.Eng., P.Eng.,



FIRE SIDE

of COCHRANE