

Garden HEIGHTS

Neighbourhood Area Structure Plan

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1.0 INTRODUCTION

1.1 VISION

The vision for Garden Heights is an unique community that incorporates the expansive natural capital within an environmentally responsible development. Garden Heights is directly linked to the McKenzie natural area; one large node of the Waskasoo park system. This sustainable neighbourhood provides a mix of housing types and efficient land use while encouraging greener building practices thereby protecting and preserving the areas ecological features.

1.2 GOALS

The goals for Garden Heights are as follows:

- Preservation of the McKenzie ravine and enhancing non-motorized access to Waskasoo park system through improved connections to McKenzie Trails, Clearview North and future development to the north;
- Encourage greener building practices;
- Support environmentally sustainable principles, best management practices and standards, ecological conservation, and management of the city's ecological footprint;
- Protect and maintain wildlife corridor, vegetation, trees and ravine area;
- Comply with relevant City planning and policy documents;
- Provide a mix of housing types through efficient land use catering to a broad range of needs and interests;
- Build a strong sense of community by providing opportunities and places for children to play and for residents to interact in both natural and built environments;
- Provide an accessible transportation network that links to trails, neighbourhoods and parks; and
- Protect Gaetz Lakes Sanctuary.

1.3 PURPOSE

The purpose of the *Garden Heights Neighbourhood Area Structure Plan* is to provide a long range plan that forms the basis for future zoning, subdivision and development decisions.

1.4 LOCATION

Garden Heights Neighbourhood Area Structure Plan is located in the northeast quadrant of the city of Red Deer. Refer to Map 1: Plan Area. The legal description is part of the SE and SW ¼ 27-38-27-4. The plan is bounded by McKenzie Trails escarpment to the west and a treed ravine to the north and east. 67th Street arterial is the southern boundary which separates Garden Heights from the Clearview North neighbourhood. Trees surround three sides of the plan area. The boundary follows the tree line on the north side of the trees.

The plan area is 65.77 hectares (162.5 acres).

1.5 NEIGHBOURHOOD IDENTITY

At the time of plan development, this area was being used as farmland with a portion being used for the successful community garden plot program. The name Garden Heights stems from the history of garden plots in the area and the location of the neighbourhood at the top of river and ravine escarpments. All streets will be named using words that begin with "G".

2.0 POLICY FRAMEWORK

Municipal Development Plan-ADOPTED MAY 8, 2008

The MDP identifies the ravine area as open space and the area south of the ravine and north of 67th Street as residential. Specific areas of the MDP that apply to Garden Heights neighbourhood are as follows:

Guiding Principles

- *Ensure the efficient use of land for urban purposes by encouraging integration of uses, increased densities and innovative designs*
- *Sustain the natural environment and protect natural systems by paying attention to site resources (hydrology, terrain, geology, biodiversity of vegetation and wildlife) while providing a climate for community and economic growth*
- *Ensure an adequate supply of residential, industrial and commercial areas to serve the growing needs of the city*
- *Build vibrant, attractive and safe neighbourhoods that provide for a range of housing choices, access to services, local employment, recreation, and open space.*
- *Provide a diversity of connected parks and open spaces that facilitate both active and passive community activities*
- *Utilize sustainable development and operational practices that promote energy efficiency, water conservation and the reduction of solid waste and other environmental initiatives*
- *Ensure safe, adequate, sustainable and reliable utility systems, including smart infrastructure and wired neighbourhoods to meet on-going community needs, while supporting environmentally sound alternatives.*

Policies

5.7 Contiguous Growth

The City should ensure new development is contiguous to the existing built-up area.

7.7 Innovative Neighbourhood Design

The City shall encourage innovative neighbourhood designs that respond to environmental, economic, demographic and market conditions; and align with goals, objectives and policies in the Plan.

9.2 Environmental Reserve Dedication of Lands Unsuitable for Development

Through the subdivision process, The City shall require that lands considered unsuitable for development (e.g. due to steep slopes or being subject to flooding or consisting of a natural drainage course or wetland) are dedicated as environmental reserve in accordance with the provisions of the Municipal Government Act.

9.3 Environmental Reserve Dedication of Lands Adjacent to Water Bodies and Water Courses

When lands adjacent to water bodies or water courses are subdivided, a strip of land shall be dedicated as environmental reserve to provide a buffer and provide public access. The width of the required dedication shall be established by the Subdivision Authority.

9.4 Use of Environmental Reserve

Lands dedicated as environmental reserve shall remain in their natural state and/or be used as part of the public park and trail system. Major municipal infrastructure may cross environmental reserve lands in the least intrusive manner possible by minimizing the impact of the crossing and taking into consideration sensitive environmental features in the vicinity of the crossing.

9.12 Environmental Sustainability Initiatives and Trends

The City should investigate and incorporate environmental sustainability initiatives and trends such as eco-friendly retrofit building programs to help ensure long-term land use and sustainable development in Red Deer.

10.1 Neighbourhood Planning Guidelines and Standards

The City shall continue to use the Neighbourhood Planning Guidelines and Standards, as amended from time to time, to provide detailed guidance on the creation of sustainable neighbourhoods.

10.2 Residential Density for New Neighbourhoods

The residential density for new neighbourhoods shall be a minimum of 14.8 dwelling units per net developable hectare. The maximum density shall be established in the Major Area Structure Plan, having regard to the capacity of major municipal infrastructure serving the neighbourhood.

10.3 Housing Mix

The City shall continue to require a mix of housing types and forms in all residential neighbourhoods. The Neighbourhood Planning Guidelines and Standards shall provide direction on the mix of housing within new neighbourhoods. This mix shall identify targets for each major type of housing and ways to avoid excessive concentration of any single type of housing.

14.3 Trails and Pathways

Trails and pathways shall be designed and constructed in accordance with the direction provided through the Trails Master Plan, as amended from time to time.

14.4 Open Space Connections

As new areas are planned and developed, The City shall ensure the design of the parks and open space system provides:

- linkages to the major open space, including along the Red Deer River and its tributaries,
- linear corridors and pedestrian connections within and between neighbourhoods; and
- consideration of continuous wildlife corridors and key wildlife habitat as identified in the Natural Area/Ecospace Classification Prioritization System referred to in Policy 9.1.

14.5 Variety of Types of Parks

The City shall ensure that a wide variety of park types are incorporated into the design of new areas, based on opportunities and the wants and needs of the community.

14.8 Gathering Spaces

In conjunction with streetscapes and other public realm areas, parks and open space shall be designed to be easily accessible to pedestrians and create opportunities for area residents to gather and interact wherever possible.

14.9 Amount of Reserve Dedication

The City shall require 10 percent of the total parcel being subdivided less any land dedicated as environmental reserve to be dedicated as Reserve (municipal reserve, school reserve and/or municipal and school reserve) in accordance with the provisions of the Municipal Government Act. The City shall encourage dedication of Reserve above 10 percent where the additional dedication supports the provision of recreation sites and preservation of natural areas that do not meet the definition of environmental reserve.

15.6 Inclusive Community-Social Interaction

The City shall promote and favour building forms, site layouts and neighbourhood designs that facilitate a high degree of social interaction possibilities among residents. This includes establishing formal and informal gathering spaces through such concepts as pedestrian friendly streetscapes and through amenities such as community gardens.

16.4 Coordination of Community Connections

The City shall coordinate the provision of road, transit and pathway connections, between and through communities, through the local area planning process.

19.4 Relation to Other Statutory Plans

All statutory plans adopted by The City shall be consistent with the Municipal Development Plan.

19.6 Public Engagement

As part of the process of managing physical growth and changes in the community, The City shall facilitate public input on matters of general or specific planning interest, wherever possible.

East Hill Major Area Structure Plan(MASP)-AMENDED DECEMBER 19, 2005

The plan was originally adopted in 1989 and amended in 1992, 2001 and 2005. This area has always been shown as residential. Access to the plan area is identified off of 67th Street and aligns with the entrance to Clearview North. There is only one access off of 67th Street in to the plan area.

A circular collector roadway is shown for the plan area. Alternative collector roadway alignments can be proposed to the satisfaction of Administration.

The ravine and seasonal stream is identified as a RS- Ravine and Seasonal Stream preservation area that potentially serves as a water source to McKenzie Trails recreational area and has storm water servicing potential.

A neighbourhood park and trail linkage is proposed in this area in the East Hill MASP. A minimum of 10% of the developable area is required to be dedicated as municipal reserve for neighbourhood parks, parkettes and linear parks, containing neighbourhood and nature trails. This is a non-typical quarter section therefore the amenity requirements are to be mutually agreed upon by the



Excerpt from Figure 5: Development Concept in the East Hill MASP showing location, land use, and conceptual road layout for Garden Heights.

Recreation, Parks & Culture Department and the developer. For Garden Heights the proposed neighbourhood park has been adapted to increase the environmental reserve (ER) boundaries.

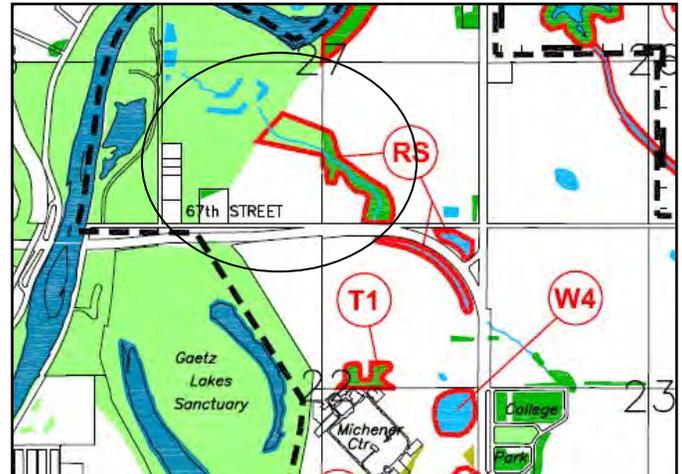
The ravine connecting a drainage channel south of 67th Street with the McKenzie Trail area in SE1/4 section 27-38-27-W4 is identified as potential ER dedication.

The steep slopes along the Red Deer River escarpment are identified as potential ER dedication.

The *East Hill Major Area Structure Plan* allows for a maximum density of 17.3 dwelling units per developable hectare.

The East Hill MASP also designates two storm ponds for this area to restrict direct storm water discharge into the creeks and river in order to limit potential damage associated with increased rates of runoff from urban developments.

A suspended gas well with a 100 metre setback is shown in the eastern corner of the plan area within the existing acreage site. This well has been abandoned since the adoption of the MASP. A 10 m by 15 m working area with 5 m radius setback is now required.



Excerpt from Figure 3 Tree and Wetland Natural Habitat Areas in the East Hill MASP showing the RS Preservation Focus for Garden Heights.

Land Use Bylaw 3357/2006

The majority of the plan area is zoned AI-Future Urban Development. A portion of the treed area and ravine reaching from McKenzie Trails is zoned PI-Parks and Recreation. The remaining portion of the treed ravine, from where the trail crosses the ravine (quarter section line), is zoned AI-Future Urban Development. The escarpment area is identified on the land use constraint map. Refer to Map 3: Existing Use.

Red Deer Trails Master Plan

The area is part of the Waskasoo Trail network which is the backbone of the entire Red Deer trail network. A 3 metre wide paved trail dissects the plan boundary along the quarter section line. A trail loop starts at 67th Street and leads into the treed ravine area toward McKenzie Trails, follows along the river and loops up the hill along 67th Street.

Neighbourhood Planning Guidelines and Standards

The Garden Heights NASP was approved under the June 19, 2008 *Neighbourhood Planning Guidelines and Standards*. The purpose of the *Neighbourhood Planning Guidelines and Standards* is to provide guidelines and required standards for the planning and design of neighbourhoods including parks and public facilities/amenities within The City of Red Deer.

The developable area of Garden Heights (24.28 hectares) is approximately one third of a typical quarter section due to the large portion of environmental reserve (39.11 hectares) contained within the plan boundary. Based on the guidelines and standards definition, Garden Heights is a non-typical quarter section which means a “a quarter section with significant natural and/or cultural features

identified for preservation which may make it difficult to incorporate all required amenities into the open space plan.”

Using judgment based on the specific situation, the plan conforms to the majority of the guidelines and standards. As an example a Place of Worship site has not been accounted for in the plan due to the size of the neighbourhood. Other special considerations are identified throughout the document.

3.0 SITE CHARACTERISTICS

3.1 HISTORY

The history of the area, as researched and provided by the Red Deer and District Archives, is as follows:

The Garden Heights Subdivision is located in the old Balmoral rural district. The first permanent settlers were a large number of Metis families who began arriving from the Headingly and White Horse Plains districts of Manitoba in 1882. They settled on a series of farms stretching from the mouth of Waskasoo Creek to the mouth of the Blindman River, south of the Red Deer River.

These settlers were very resilient and resourceful. They established one of the first sawmills and brought in the first threshing machine. They ran a ferry and later built the first bridge across the Red Deer River, even though they had no formal training in bridge building. The McKenzie Trail area in the Waskasoo Park system is named in honour of the leaders of this remarkable group of settlers.

Unfortunately, many of these Metis families made their claims and started their farms before the government surveys were completed. They later found out that they were living on land which had been sold to the Saskatchewan Land and Homestead Company by the Federal Government. Numerous attempts to gain title to their land proved frustrating and ultimately futile. Eventually, almost all of these Metis families left the district in disgust.

Section 27 was one of the sections which had been sold by the government to the Saskatchewan Land and Homestead Company. The S.E. quarter was later sold to John Jost Gaetz, who had originally homesteaded the land where the Gaetz Lakes Sanctuary and Michener Centre are now located. This quarter was acquired in 1918 by Andrew McRoberts.

It was later purchased during the Second World War by the McFarlane Brothers, who operated one of the most famous dairy farms in Central Alberta. The McFarlanes started living in the large old historical house on the quarter in 1945. They also named their operation Arrochar Farm after their ancestral home in Scotland. The portion of 67th Street, from the Red Deer River to what is now 30th Avenue, became known as Arrochar Road.

The Nicholson family purchased the SW quarter of Section 27 from the Saskatchewan Land and Homestead Company in 1923. While they periodically rented the property out, they also built up a dairy operation on the property. Their daughter Doris married Gordon Towers, a long time Member of Parliament for Red Deer and eventually Alberta's Lieutenant Governor. The Nicholson farm was later taken over by the youngest member of the family, Ruby, and her husband Don Johnson.

Central Alberta has always been known ecologically as the parklands because of the park-like appearance of the natural vegetation. Red Deer also developed a very strong park and horticultural tradition with the first element of the Waskasoo Park system being started in 1909 with the creation of Gaetz Park, the Red Deer Horticultural Society being formed in 1911 and Gaetz Lakes Sanctuary area being formally designated as a Dominion Bird Sanctuary in 1924.

For many years, the official motto of the City of Red Deer was “The Garden City”. In 1984, the City launched the community garden plot program and eventually these garden plots were located next to 67th Street. This program was the inspiration for naming the subdivision “Garden Heights”.

Michael Dawe, June 30th, 2008

3.2 CURRENT LAND USE

The developable area of the plan is gently undulating agricultural land. This is surrounded by treed areas, river escarpment and ravine that are part of the park system and trail network. The area is well used as an access point to the McKenzie Trail system. Vehicles park on the gravel service road adjacent to 67th Street and access the trail.

An air photo and topographic map (Map 2 and 5) of the plan area show the surrounding current land uses and contours of the area. The plan area is at a significantly higher elevation than 67th Street. The 67th Street road right of way is steep along the southwest boundary. Trees have been planted in this area by the Citizens Action Group on the Environment (CAGE) to prevent erosion of the slope. As you move east along the southern boundary along 67th Street the slope decreases to almost level with 67th Street. A row of power lines runs along the southern boundary within the plan.

There are 179 community garden plots, approximately 3.9 hectares (9.7 acres), adjacent to the service road that runs parallel to 67th Street. The garden plots are being relocated to several other locations in the city.

The gravel service road provides access to the two country residential acreages. There is a separate 2.43 ha (6 acre) parcel in the south west corner of the plan area that is privately owned and occupied. The quarter section east of the trail is also privately owned. Two unoccupied homes and a large barn are situated where the treed ravine intersects 67th Street.

There is an abandoned well site along the trees in the eastern corner of the plan area within the existing acreage site.

South across 67th Street is a mix of residential type housing and a mixed use commercial/town centre site as part of the Clearview North neighbourhood.

Along the west is the river escarpment that overlooks a 7 lot acreage development and McKenzie Trails.

3.3 LAND OWNERSHIP

At the time of plan adoption, the plan area is comprised of three separate parcels owned by different parties. Please refer to Map 3: Existing Use.

- SE1/4 Sec 27-38-27-W4 is a parcel jointly owned by Melcor Developments and private individuals 12.17 hectares (30 acres) is within the plan boundary.
- 64.7 hectares (160 acres) +/- balance of the SW1/4 Sec 27-38-27-W4 is owned by The City of Red Deer. 51.13 hectares (126 acres) is within the plan boundary.
- 2.4 hectares (6 acres) +/- of SW 1/4 Sec 27-38-27-W4 is owner occupied by private individuals.

All three parties were consulted during the NASP process and support the plan.

4.0 SUSTAINABILITY

Sustainable development, according to the *Municipal Development Plan*, is development that meets the needs of today without compromising the ability of future generations to meet their own needs. There has been a conscious effort to incorporate sustainable initiatives in the Garden Heights neighbourhood. The goal of Garden Heights is to promote pedestrian activity and public health, improve air quality, reduce pollution, increase energy efficiencies, encourage renewable energy sources, and conserve water resources for the benefit of all citizens.

LEED (Leadership in Energy and Environmental Design) certification provides independent, third-party verification that a development's location and design meet accepted high levels of environmentally responsible, sustainable development. LEED certification is a well known rating system for industrial and commercial building design in Alberta. The draft *LEED Neighbourhood Design* (LEED ND) rating system, which is currently in its pilot period, integrates the principles of smart growth, urbanism and green building and forms the basis for several of the initiatives contained in the plan. LEED ND is expected to launch in 2009 and become the national rating system for neighbourhood design in the United States.

The following initiatives, based on recommendations from the draft LEED ND and *City of Red Deer Smart Growth Principles*, have been implemented above and beyond those standards that contribute to sustainability as required in the *Neighbourhood Planning Guidelines and Standards*:

- Limit the impacts on the ravine by incorporating stormwater management best practices to infiltrate, re-use, or evapotranspire the average annual rainfall from the plan area.
- Road and utility systems were designed to minimize impact on the ravine and natural areas.
- There is over 1.8 km of new trail being developed within the plan boundary to encourage multi-modal transportation.
- 100% of dwelling units are within 5 km of a commercial service area using an existing biking/multi-use trail.
- The roundabout reduces vehicle idling.
- A full cutoff street light fixture which prevents light projection above the horizon will be installed. This will reduce ambient lighting from the proposed development to reduce development impact on nocturnal environments.
- A potential community garden plot area is shown to promote local food production to minimize the environmental impacts from transporting food long distances and increase direct access to fresh foods.
- Within the plan area the playgrounds and active open space facilities are of at least 0.4 ha and within 800m walking distance from 100% of the dwelling units entrances.
- Within plan area 100% of all dwelling units are located within 400 m walking distance of a multi-use trail of at least 5 km in length.
- Within plan area 100% of all dwelling units and non-residential building entrances in the project are located within 400 m walking distance of a park with active recreational facilities.
- Single family lots on City developed land will participate in the residential tree lot program and will be provided with one or two trees, depending on location, per residential lot.
- Multifamily (R3) residential site is encouraged to be LEED or third party certified as energy efficient.
- Multifamily (R3) residential site is encouraged to provide bicycle parking spaces or bicycle storage capacity, within 250 m of a building entrance, of no less than 15% of the parking space capacity provided for the site. As an example, if there are 100 parking spaces then must provide 15 bicycle parking or storage spaces

- Over 50% of the dwelling units are within 1 km walking distance of planned school site in the Clearview North neighbourhood via a controlled intersection to encourage walking to school.
- The City's detailed parks and open spaces plan will be reviewed by Environmental Services and Recreation, Parks and Culture Department to determine if there are water conservation strategies that could be achieved in the public parks with naturescaping rather than the standard lawn.
- Incorporation of a green development site as a pilot project to encourage a sustainable development that incorporates eco-friendly, energy efficient technologies in the construction and site design of the development.
- Development of a greener building program specific to all single family and semi-detached homes built in the City's portion of Garden Heights neighbourhood to encourage construction of energy efficient homes. Other land owners will explore programs in developing their portions of the plan.

5.0 LAND USE ALLOCATION

5.1 DEVELOPMENT CONCEPT

Based on site characteristics and City of Red Deer planning documents, a development concept has been prepared as presented in Map 4. The development concept has been overlaid on an aerial photo in Map 5 which also shows the relation to surrounding development.

The Garden Heights NASP is comprised of 65.77 hectares (162.5 acres) which is the gross plan area. The net developable area is the gross plan area, less the area dedicated for environmental reserve (ER) and the major utility right of way located in the berm. The net developable area is 24.46 hectares (60.4 acres) which will be used for calculating density.

The following assumptions, based on the *Neighbourhood Planning Guidelines and Standards*, were made in the creation of Table 1: Land Use Allocation:

- 1) For density calculations each secondary suite counts as half a detached dwelling unit. There are 6 secondary suites which count as 3 dwelling units.
- 2) R1 single family lots for detached dwellings are assumed to be on average 464 m² with frontages of 13.25 metres and lot depths of 35 metres.
- 3) R1A semi-detached lots are assumed to be on average 595 m² with frontages of 16 to 19 metres (min. of 7.6 metres per unit) and lot depths of 35 metres. One lot counts as two dwelling units.
- 4) R1 and R1A mixed residential lots are assumed at 375 m² with an average lot width of 10.7 m by 35 m deep.
- 5) R2 medium density residential is assumed at 35 dwelling units per hectare.
- 6) Green development site in Scenario A & B is estimated at 35 dwelling units per hectare. Depending on the green development proposal this could vary. Scenario C is estimated with a mix of single family (R1) and medium density (R2) residential.
- 7) R3 multi-family residential is assumed at 85 dwelling units per hectare.

TABLE I: LAND USE ALLOCATION TABLE

Land Use Category	Area (ha)	% of Plan Area	Dwelling Units
Gross Plan Area	65.77	-	-
Environmental Reserve	39.11	-	-
Major Utility Right of Way in Berm (PUL)	2.2	-	-
Developable Plan Area	24.46	100	-
Residential			
<i>Scenario A (Base)-Total Residential with Assisted Living Site Developed</i>			463
Single Family Residential (R1)	5.22	21	113
Mixed Residential (R1 and R1A)	1.05	4	28
Semi-detached Residential (R1A)	.97	4	33
Medium Density Residential (R2)	2.91	12	102
Multi-Family Residential (R3)	0.89	4	76
Green Development (R2)	3.12	13	109
Secondary Suites (s)	Incl. in R1	Incl. in R1	3
<i>Scenario B-Assisted Living Site as Mixed Use Residential</i>			466
Additional Mixed Residential (R1 and R1A)	0.14	-	3
<i>Scenario C- Green Development Developed as Alternate Land Use</i>			417
Single Family Residential (R1)	1.46	-	31
Medium Density Residential (R2)	.89	-	31
Social Use			
Assisted Living/Day Care/Temp. Care Site	0.14	1	-
Open Space			
Municipal Reserve (MR)	3.85	15.7	-
Public Utility Lot (PUL) (excluding berm 2.2)	1.37	6	-
Environmental Reserve (ER)	39.11	-	-
Transportation			
Roadways	4.07	17	-
Lanes	.97	4	-

TABLE 2: LAND USE ALLOCATION BY OWNER

Owner/Land Use (hectares) (Base Scenario)	City of Red Deer	Melcor & Partners	Private Individuals	Total Plan Area
Gross Developable Area	51.13	12.17	2.47	65.77
Environmental Reserve (ER)	33.18	4.49	1.44	39.11
Major Utility ROW in Berm	2.20	-	-	2.20
Net Developable Area (Gross Dev.-ER-Utility)	15.57	7.68	1.03	24.46
Municipal Reserve (MR)	2.54	1.09	.22	3.85
% of MR (MR/Net Dev.*100)	16.1	14.19	21.36	15.74
Public Utility Lot (PUL)	1.37	0	0	1.37
Total Residential	8.79	4.77	.6	14.16
Assisted Living/Day Care/ Temporary Care Site	.14	0	0	.14

5.2 DENSITY AND HOUSING MIX

The developable area of Garden Heights is intended for residential development with the exception of the assisted living, day care or temporary care site. There is a variety of housing types from low to high density appealing to various income levels and demographic groups.

The plan proposes an efficient use of land with an estimated residential density between 17.2 and 18.9 dwelling units per hectare of developable plan area. A density range is provided due to the different scenarios for the green development and assisted living/day care/temporary care site. Projected densities are higher than the *Neighbourhood Planning Guidelines and Standards (NPGS)* required minimum density of 14.8 dwelling units per hectare of developable plan area. There is no maximum density in the NPGS or *Municipal Development Plan*. The *East Hill Major Area Structure Plan* allows for a maximum density of 17.3 dwelling units per developable hectare within which the proposed range could fall.

The NPGS have housing mix ratios and standards for clustering to ensure there is a variety of housing types integrated throughout a neighbourhood. The housing mix ratios do not meet the NPGS because of the high density proposed for the neighbourhood. This is acceptable to planning staff because of the neighborhoods' proximity to the town centre commercial development, a major arterial and the additional green space. 64.3% of the total plan boundary is a combination of environmental and municipal reserve. NPGS clustering standards will still apply in the development of Garden Heights to ensure there are a variety of housing types.

The following assumptions were made in the creation of Table 3 and 4: Density and Housing Mix:

- 1) Multi-family dwelling means three or more attached dwelling units (R2 & R3).
- 2) The actual density for the R3 multi-family site is not prescribed in the *Land Use Bylaw* and is determined by the Development Authority at the time of development permit approval. Depending on the actual densities achieved on the multi-family sites the neighbourhood density may vary slightly from the calculated densities.
- 3) Secondary suites are excluded from the calculation.

TABLE 3: DENSITY AND HOUSING MIX

	Dwelling Units (du)	Developable Area (ha)	Density (du/ha)
<i>Scenario A (Base)-Total Residential with Assisted Living Site Developed</i>	463	24.46	18.9
<i>Scenario B-Assisted Living Site as Mixed Residential</i>	466	24.46	19.1
<i>Scenario C- Green Development developed as Alternate Land Use</i>	417	24.46	17.2

TABLE 4: HOUSING MIX

<i>Scenario A (Base)-Total Residential Development and Assisted Living Site Developed</i>	%	City Neighbourhood Standard
Detached (R1) and semi-detached dwelling units (RIA) as a % of the total housing stock	37%	min. 60%
Multi-family dwelling units (R2, R3) as % of the total housing stock	62%	min. 20%
Percentage of semi-detached dwelling units (RIA) to detached dwellings units (R1)	37%	max. 25%

6.0 RESIDENTIAL

6.1 SINGLE FAMILY RESIDENTIAL (R1)

Single family residential is located on the interior of the neighbourhood since these lots typically generate the least amount of traffic. Housing forms will consist of single detached dwellings in a variety of lot sizes. Lots allocated for single family will be designated R1 Single Family Residential.

As recommended in the geotechnical report single family residential lots backing on to the escarpment, at the time of subdivision, will have restrictive covenants placed on the titles ensuring there are no underground sprinklers or pools in the rear yards. Excessive water use may weaken the escarpment and cause failure of the bank. A geotechnical report was completed to determine the safe setback from the escarpment to prevent liability issues.

Single family residential lots have a 12 metre minimum lot width and 30 metre minimum lot depth. Two storey walkout lot locations are identified on Map 4: Development Concept. Two storey walkouts are shown on lots that back on to a green space and will be allowed should site grading accommodate a walkout lot when the actual construction occurs. A NASP amendment is required for any additional walkout locations.

6.2 MIXED RESIDENTIAL (R1 AND R1A)

Lots for single family detached dwellings and semi-detached dwellings are provided in a designated mixed residential area. These areas serve as a transition from the high density residential to single family residential.

Within the mixed residential areas a minimum of 50% of the lots provided will be designated single family residential (R1) and a minimum of 35% of the lots will be designated as semi-detached residential (R1A). Lots are designated at the time of subdivision. Groups of semi-detached lots will consist of not more than three adjacent lots (six dwelling units) and such groups will be separated by at least two adjacent lots designated either single family residential, public utility or road.

Semi-detached residential lots have a minimum frontage width of 7.6 metres in addition to a side yard setback. The minimum lot depth is 30 metres.

The alternate use for the assisted living/temporary care/day care site is mixed residential (R1 and R1A).

6.3 SEMI-DETACHED RESIDENTIAL (R1A)

A close of semi-detached residential is located east of the entrance. Within this land use designation single-family and semi-detached dwelling units are permitted. Semi-detached residential lots have a minimum frontage width of 7.6 metres in addition to a side yard setback. The minimum lot depth is 30 metres. These lots back on to the divided collector entrance; therefore, a solid low maintenance fence will be provided by the developer. Design of the rear façade will be given the same consideration as the front of the home to maintain aesthetics of those entering the neighbourhood. There is no lane provided adjacent to the entrance.

6.4 MEDIUM DENSITY RESIDENTIAL (R2)

A large area east of the entranceway is designated R2 medium density residential. This land use designation allows a variety of housing types such as single family, duplex, townhouse and three storey apartments. Based on the NPGS clustering requirements, a range of housing types must be

provided within this area to avoid monotony and large clusters of the same type of housing. The developer will work with builders to create attractive pedestrian oriented housing types. The lanes may require paving if more than 60 units access the lane.

An abandoned well site is also located within the R2 site east of the tot lot as on Map 4. The well site is capped a minimum of 1 metre below the ground surface. This area can only be used for parking or open space. If the area is to be used as parking surface it can only be covered by a permeable surface material so if there is any leaking from the well it is able to migrate to the surface and the problem is made aware.

6.5 MULTI-FAMILY RESIDENTIAL (R3)

A multi-family residential site is proposed adjacent to the roundabout. This site will be designated R3 multi-family residential. It is anticipated that the site will be developed as a multi-storey apartment building. The anticipated density of this site is 85 dwelling units per hectare which will accommodate approximately 76 units.

This site will generate additional traffic and the location provides easy access in and out of the neighbourhood. For safety the access point to the multi-family site can be no further west than the end of the line painting on the eastern leg of the roundabout and it is preferred that the access is aligned with 'A' close. Any variance thereof will be to the satisfaction of Engineering and a NASP amendment is not required.

The site is in close proximity to transit stops, green space and the potential garden plot site. The proximity to the garden plots allows for residents to use the garden plots and encourages more eyes on the site to minimize vandalism. There may be some efficiency created by directing site drainage for use in the garden plots.

This site is a terminal vista and provides a first impression as visitors and residents enter the neighbourhood. The site layout, landscaping and attractive building design will enhance the vista. Parking areas should be screened to maintain a park like vista for those entering the neighbourhood. The design of the building or buildings will take advantage of the proximity to the treed ravine and trail network.

The multi-family residential building is encouraged to be LEED or third party certified as energy efficient. As well due to its close proximity to the trails the developer will provide bicycle parking spaces or bicycle storage capacity, within 250 m of a building entrance, of no less than 15% of the parking space capacity provided for the site. As an example, if there are 100 parking spaces then the developer must provide 15 bicycle parking or storage spaces.

6.6 GREEN DEVELOPMENT (R2)

The vision for the 'green' development site is a sustainable development that incorporates eco-friendly, energy efficient technologies in the construction and site design of the development. This area is being dedicated to demonstrate options and pilot new technologies which may form the basis for future neighbourhood planning and design within the city.

The City of Red Deer Land and Economic Development Department will lead an advisory committee comprised of representative from select City departments. The advisory committee will request proposals to develop the 3.12 hectares (7.7 acres) labeled the green development.

Criteria to evaluate the proposals will be developed by the advisory committee considering the following potential categories as a guideline:

- Overall sustainability based on the 3 E's-equity, economics, and environment
- Energy systems approach
- Connectivity to the rest of the Garden Heights neighbourhood
- Innovation in design and technology
- Energy certification level of homes by a third party certification program
- Replication potential
- Knowledge sharing potential and education component
- Attainability and variety of housing types
- Applicants experience in designing and delivering similar projects and demonstration of environmental awareness
- Site coverage and landscaping
- Work plan and timelines
- Price bid on the land

The area will be designated R2 medium density residential which allows single family, semi-detached, and/or multi-attached residential to a maximum of three storeys. Depending on the proposal awarded some relaxations to the *Land Use Bylaw* regulations may be required.

The anticipated number of units is 109 based on 35 dwelling units per hectare. This may vary depending on the proposal put forward by the developer. As per the *Neighbourhood Planning Guidelines and Standards*, a variety of housing types is also encouraged within the site to avoid clusters of more than 60 units of multi-attached or semi-detached housing.

The internal road system will be self-contained. The rear façade of dwelling units that back on to the trail along the divided collector entrance shall be given the same consideration as the front facade to ensure an aesthetically pleasing view for trail users and traffic entering the neighbourhood. There will be no rear yard access from the divided collector entrance.

An emergency access on to the divided collector entrance will be incorporated. A joint access agreement as well as an agreement for snow removal and maintenance will be required between the developer and The City.

Alternate Use

If an appropriate applicant is not found after calling for proposals then the site will be sold or developed by The City. The area will be designated a combination of R2 medium density residential and R1 single family residential. R2 medium density residential will front 'E' Street and back on to the divided collector entrance. The remainder will be R1 single family residential. 'D' Crescent will be developed as a public local roadway. An all weather emergency access with bollards at each end will connect to the south lane.

6.6 GREENER BUILDING PROGRAM

The Garden Heights greener building program is specific to all new single family and semi-detached residential built on the City portion of the Garden Heights neighbourhood. The program is intended to introduce builders and homeowners as general contractors to greener building practices and accelerate the rate in which builders go above the minimum building code standards to incorporate green building practices to improve energy efficiency, indoor air quality and resource use, while reducing overall impact on the environment. The City of Red Deer will use acceptable third party certification agencies, such as Green Built™ or EnerGuide™, to ensure a specific home energy efficiency level is achieved.

Other land owners in Garden Heights will also explore programs to encourage green building in developing their portions of the plan.

6.7 ARCHITECTURAL GUIDELINES

Design standards shall be developed and form the Architectural Guidelines for Garden Heights to be used by landowners and builders to shape the design, form, and aesthetics to ensure a consistency in development while still allowing for diversity and creativity. Diversity is desirable and considered an important characteristic to add variety and to avoid monotony.

The guidelines will be a separate document that is used for all development in the Garden Heights neighbourhood. These are set up and tailored by each land developer in Garden Heights and may differ between developers. These architectural guidelines shall provide guidance in addition to the requirements of the *Land Use Bylaw* but do not form part of the *Land Use Bylaw*.

The goal is to achieve a balance between a consistency of design as well as individual expression. As an analogy, buildings should look like they are part of a 'family' while containing their own unique personalities. The architectural guidelines could cover the exterior elevations, home sizes, roof, entrances, garages, landscaping, front entries, and fences. The following example guidelines could be considered in the development of architectural guidelines for Garden Heights:

- All street facing sides of homes situated on corner lots or backing on to the divided collector entrance, trail system, or storm water management facility are given the same consideration as front facades.
- Architectural elements such as gables, balconies, verandas, bay windows, cornices, projections, recesses, terracing, window and door trim are used to minimize repetition, perception of mass and height and to break up large flat surfaces, including roof faces. On elevations facing streets, green spaces and/or the divided collector, surfaces with a vertical or horizontal wall length greater than 5 metres (16 feet) in either direction should not be permitted.
- Window or doors facing a street are trimmed with borders.
- All main floor residential units including multi-family, fronting onto a public street or park, have an individual front entry that can be accessed directly from the public sidewalk or trail through a private front yard.
- More than one type of high quality and innovative building materials, such as, but not limited to, brick, stone, concrete and cement stucco are used in a variety of combinations on the facade.
- There are no more than 6 multi-attached units in one block.
- The main entrance of the principal building is clearly identified, visible and accessible from the principal frontage streets.
- A uniform type of fence of an open design is used in rear yards of homes that back on to a green space to maintain site lines.
- Front garages are deemphasized in design of the façade.

7.0 ENVIRONMENTAL, ECOLOGICAL, HISTORICAL AND CULTURAL RESOURCES

7.1 ENVIRONMENTAL RESOURCES

Environmental Site Assessment

An *Environmental Site Assessment* was completed in July 2007 by Parkland Geotechnical. Three potential issues, as detailed below, were identified in the assessment in relation to environmental risk.

1) The former well site at LSD 02-27-38-27-W4 showed no visual indication of contamination or environmental impacts but residual pockets of hydrocarbon contamination have been known to exist in localized areas around these former sites. It was recommended that the well head be located and a limited soil investigation be performed to determine if there is any indication of contamination prior to the stripping of soil or any development.

In phase 3 of the implementation plan, the former well site at LSD 02-27-38-27-W4 will have the well head located and a limited soil investigation will be performed to determine if there is any indication of contamination. The surface soil at the AST (above ground storage tank) site will be removed during pre-grading to remove any hydrocarbon impacted soils.

2) An AST (above ground storage tank) was found on the homestead located on the SE 27-38-27-W4 with minor surficial staining present under the tank. It was recommended that the surface soil at the site be removed prior to development. Pre-grading will be completed and remove any hydrocarbon impacted soils.

3) The former McKenzie Trail landfill site is located down gradient approximately 400 metres northwest of the Plan area. The residential subdivision meets the required 300 metre planning setback from a closed landfill and potential leachate from the property is negligible.

Parkland Geotechnical concluded that *“with the exception of potential localized impacts from the former well site, the majority of this property is considered to have a ‘low’ rating in terms of environmental risk. Provided the recommended assessment of the former well site is undertaken, the potential impacts on the remainder of the property is expected to be minimal.”*

Geotechnical Investigation

A geotechnical investigation was completed by Parkland Geotechnical in June 2008. This report details the suitability of the surface soil and the substrates for new building construction. This geotechnical information provided the basis for determining where the line between stable and unstable soil was drawn along the escarpment and ravine.

For the purpose of interpreting the information below, the crest is defined as the line where there is a distinct break in the grade at the top of the slope as determined by the intersection of the slope angle with the extension of upland surface grade. This is otherwise known as the top of bank.

Escarpment

The escarpment area is defined as the treed area on the west side of the plan area. The geotechnical investigation says

“ the minimum recommended set-back distance for the proposed nearest property line to the crest is at least 15m. The minimum recommended set-back distance for the proposed permanent structures on these lots is 25m. The recommended set-back will provide a buffer between the house and the slope in the event of slope movement along the crest. ...

The natural slope in the vicinity of the proposed residential area is considered to be relatively stable and the slope is not subject to erosion at the toe. The possible removal of soil from the basement excavation near the crest will have a net stabilizing effect on the slope. Regressive slumping of the upper lacustrine slope is considered to be the most likely mode of slope failure. Local experience for these mature slopes of the Red Deer River valley suggests that in the event of a normal crest regression, a typical failure block about 3 to 8 m wide would be lost within the set-back buffer between the property line and the crest. A major regression might result in a loss of up to 15 m of crest area. The recommended set-back would allow 2 or 3 regressions of the crest before the proposed house would be impacted and at least 1 regression before private property would be impacted.”

Ravine

The recommendations for the top of the ravine area that wraps around the north and west sides of the plan are as follows:

“For ravine crest areas above slopes with an average angle flatter than 6H:1V, specific set-back restrictions are not required for laying out property lines or permanent residential structure locations. For illustrative purposes, a 6H:1V slope is the approximate side slope for a walk-out basement on a typical house structure.

For crest areas above slopes steeper than 6H:1V, the development restriction for recommended location of property lines should be set-back at least 3m. In addition, the property lines should be set back a distance equal to the height of the slope steeper than 4H:1V (ie. 1xH_s). Permanent residential structures should be set-back an additional 0.5xH_s from the property line. For example, the north side of the ravine section on Figure 8, indicates a steep (2H:1V) section between elevation 870 and 883m, for a height of 13m. Therefore, the recommended setback to the north of this ravine crest should be 13m. The flatter section of the ravine base and incised channel depth would not have be counted for the setback calculations since the chance of sliding in the flatter base area and the impacts of a small slide along the incised channel are both negligible on the upper slope which is of most concern.”

Additional Slope Development Recommendations

The following are further recommendations for development occurring near the slope:

“The slope face of the escarpment and the ravine may be subject to minor surficial failures, especially in localized steepened areas. Slope face stability is influenced by precipitation, surface erosion, groundwater and soil moisture conditions. In order to reduce the possibility of surficial slumping the slope should be kept well vegetated. It is also important the site development does not initiate any detrimental changes to the subsurface conditions and slope geometry. For the slope face and areas above slopes with average slope angles steeper than 4H:1V the following recommendations are provided:

- 1. Permanent removal of the vegetation from the slope is not recommended and growth of new vegetation of the slope should be encouraged. Any vegetation that has to be removed should be replaced as soon as possible. New vegetation for this site be selected from native types with deep root systems that can grow with a minimum of watering.*
- 2. Erosion control measures should be implemented as necessary. Site grading carried out should be designed to drain water due to rainfall and snow-melt away from the slope. If required, features to carry concentrated flows over the crest should be engineered.*

3. *Permanent underground lawn sprinklers or ornamental ponds should not be permitted within 15m of crest areas. If swimming pools are proposed they should be properly designed in consultation with qualified engineers; and should provide with leak detection and control systems.*
4. *One of the most common mistakes for top of slope residential development is for house contractors to push basement fills onto sloped areas to level out back yard grades. Excess material from basement excavations should be removed from the top of slope lots; and under no circumstances be wasted over the slope face. No new fill should be imported to top-of slope lots. Backyard fills around house within 30m of the crest should be placed on native inorganic subgrade and should be kept to less than 1m in thickness. Significant post development grading on proposed lots along the crest area should not be undertaken without a detailed engineering review.”*

Section 7.3 discusses the river valley escarpment setback area for *Garden Heights NASP* based on the above conclusions.

7.2 ECOLOGICAL RESOURCES

Ecological Evaluation

An ecological evaluation was completed by Recreation, Parks and Culture Department using the City’s *Ecospace Management Plan*. Within the plan area three areas of significant importance that relate to development were identified and are listed below. The application of this information is discussed in Section 7.3.

1) Red Deer River Escarpment

The first area of importance is the Red Deer River escarpment and associated trees and vegetation on the west side both on top and along the overall escarpment provides strength that needs to be maintained in order to mitigate the risks of a future slide. These slopes are steep and vegetated with a combination of coniferous and deciduous trees, shrubs and grasses.

2) Ravine Drainage Course

The second area of importance is the ravine on the north side of the plan area that acts as a drainage course, managing surface storm water while carrying it to the Red Deer River basin. This drainage area enters a small series of wetlands within McKenzie Trails prior to the water entering the Red Deer River. This water course risks being dried up as storm water for this and adjacent development is handled in a conventional method.

3) Wildlife Corridor

Garden Heights neighbourhood with its proximity to the Red Deer River basin, Waskasoo Park and the natural ravine make it a suspected corridor for wildlife in the city. There are natural areas in all directions of this development resulting in this being a natural hub of wildlife activity. The plan is linked by Gaetz Lakes Sanctuary to the southwest, to the north the natural access through the river bend corridor, to the northeast a major wetland and south and southeast locations have the College Park natural area and major east hill wetland. As a result it is recommended measures should be taken to ensure that incidences between nature and development are managed in an appropriate fashion.

7.3 RIVER VALLEY ESCARPMENT SETBACK AREA

The 25 metre river valley escarpment setback area is based on combining the results of the geotechnical investigation, providing increased public access to the area and protecting ecological resources. The setback is a combination of environmental and municipal reserve. The natural grades will become the base grades and development will work with these grades.

The geotechnical report recommended a 15 metre setback from the top of bank (crest) which is considered to be environmental reserve (ER). In addition to the 15 metres, a 10 metre wide municipal reserve (MR) section with a trail has been added which will include a 2.5 metre multi-use trail and act as a wildlife corridor based on the ecological profile's identification of a suspected wildlife corridor along the top of bank. The municipal reserve setback also provides an additional setback between the top of bank and the property line. This exceeds the recommendations of the geotechnical report.

The top of bank line has been estimated from the geotechnical investigation. Before subdivision proceeds in the area, a top of bank survey will be conducted by a legal surveyor to accurately define the top of bank location. Based on this survey some minor adjustments may be required to the conceptual environmental and municipal Reserve areas as shown on the development concept..

The Red Deer River escarpment and associated trees and vegetation on the west side both on top and along the overall escarpment are being preserved to provide bank stability.

A wildflower meadow is located where the trail heads north across the ravine as identified in the air photo on the right. The meadow will be preserved as environmental reserve. The following species have been identified by the Parks Department: Wild Blue Flax (*Linum lewisii*), Smooth Fleabane (*Erigeron glabellus*), Meadow Blazingstar (*Liatris punctata*), Western Wild Bergamot (*Monarda fistulosa*), Mountain Goldenrod (*Solidago spathulata*), Early Blue Violet (*Viola adunca*), Common Harebell (*Campanula rotundifolia*), and *Potentilla* (*Potentilla fruticosa*).



The ravine on the north side of the plan area that acts as a drainage course, by managing surface storm water, is being protected. Drainage and runoff from Garden Heights will not be allowed to flow over the bank in to the ravine. The dry storm water management pond will be used to collect runoff. Measures, like a pipe and valve system, will be put in place to ensure that if extra flow in to the ravine is needed, once storm water from the Clearview North neighbourhood has stopped, that water can be let in to the ravine at a controlled rate to ensure that the small series of wetlands at McKenzie Trails remain in tact. This will be monitored by The City's Parks Department.

The dry storm water pond was strategically placed in the current low point of the neighbourhood. A dry storm pond was chosen rather than a wet pond to minimize pressure on the bank.

Wildlife will be able to continue to use the treed ravine and area along the escarpment. Links for wildlife will be maintained between the Gaetz Lakes Sanctuary in the southwest, the north natural access through the river bend corridor, the northeast major wetland and in the south and southeast locations the College Park natural area and major east hill wetland. Measures have been taken to

ensure that incidences between nature and development are managed in an appropriate fashion. A wildlife fence will not be installed as posted traffic speeds on 67th Street are below 80km an hour. The absence of fencing also maintains aesthetics of the natural environment and linkages. Rear yards will be fenced.

7.4 MUNICIPAL AND ENVIRONMENTAL RESERVE

Section 666 of the *Municipal Government Act* provides The City of Red Deer, as the Approving Authority, the right to require the owner of a parcel of land that is subject of a proposed subdivision to provide 10% of the parcel as municipal reserve or money in place of municipal reserve or a combination thereof.

The Plan allocates 3.85 hectares (9.5 acres) of land as municipal reserve. This is 15.7% of the developable plan area. A breakdown of the municipal reserve is included in Table 3: Municipal and Environmental Reserve. These areas will be designated PI-Parks and Recreation.

Section 664 of the *Municipal Government Act* provides The City of Red Deer, as the Approving Authority, the right to require the owners of a parcel of land that is subject of a proposed subdivision to dedicate environmental reserve if it consists of a gully, ravine, coulee or natural drainage course or a strip of land that abuts a river or stream for the purpose of preventing pollution, environmental degradation and providing access.

Based on the recommendations from the East Hill MASP, ecological evaluation and geotechnical investigation, 39.11 hectares (96.6 acres) of land is being dedicated as environmental reserve due to the proximity to the ravine, function as a natural drainage course and proximity to the Red Deer River. These areas will be rezoned to A2-Environmental Preservation from PI-Parks and Recreation and A1-Future Urban Development to ensure these lands are preserved in their natural state and can only be modified with the approval of The City of Red Deer.

These environmental and ecological resources including native trees and wetlands are being used as green infrastructure which is the network of natural lands, open space, waterways, and smart growth design measures that form the framework for healthy and sustainable communities. With green infrastructure in place, Red Deer can protect native species and ecological processes, maintain clean air and water, reduce habitat fragmentation, pollution, and other threats to biodiversity, and improve the health and quality of life for people.

TABLE 5: MUNICIPAL AND ENVIRONMENTAL RESERVE

Municipal Reserve	Hectares	% of Gross Plan Area (65.77 ha)
Wildlife Corridor (Setback Area including Trail)	2.85	4.3
Junior Playground	.22	.33
Vista Park-including Garden Plots & Parking Lot	.32	.49
Trail Linkages	.12	.18
Tot Lot	.34	.52
<i>Total</i>	<i>3.85</i>	<i>5.85</i>
Environmental Reserve		
<i>Ravine and Escarpments</i>	<i>39.11</i>	<i>59.5</i>
Public Utility Lot		
Storm Water Management Facility-Dry Pond (SWMF)	1.39	2.1
Berm	2.2	3.3
<i>Total</i>	<i>3.57</i>	<i>5.4</i>

7.5 HISTORICAL RESOURCES

The *City of Red Deer Survey of Historic Sites* provides a listing of all sites within the city of Red Deer that have potential historic significance. There are two farm houses and a barn located in the eastern portion of the plan boundary that was identified in the survey. These sites were constructed circa 1937.

The first house is a two storey home with a medium gable roof and is clad with stucco. The second house is setback and is a one and a half storey farm house with a medium gable roof and a shed roof with a roof dormer. It is clad in shiplap siding. The large barn has a gambrel roof and is clad in wood siding. The barn has collapsed since the completion of the historic site survey. The exterior of these sites are listed in fair to poor condition. Without an adaptive re-use for these sites, preservation is not possible.

The Red Deer and District Archives should be provided with an opportunity to do an architectural documentation of these sites prior to removal.

7.6 CULTURAL RESOURCES

The large amount of environmental and ecological resources as well as the historic location of the garden plots shall be interpreted for the benefit of the community. The name Garden Heights stems from the history of garden plots in the area since 1998 and the location of the neighbourhood at the top of river and ravine escarpments. All streets will be named using words that begin with “G” and should have a garden theme. Names could be chosen after renowned gardeners, plants, trees, or gardens. Example names could be Geelong (public garden in Australia), Gladioli, Goldenrod, Green, Gardenia, Ginger, Gour, etc.

The neighbourhood entrance sign should include a garden theme. The areas landscaping plan should brand the neighbourhood with a flower. As an example a flowering cabbage could be used consistently throughout the neighbourhood. There are also many perennials that are low maintenance for use in public areas.

8.0 TRAILS AND PARKS

8.1 PEDESTRIAN CIRCULATION

To promote public health and community interaction, the plan provides a comprehensive network of accessible pedestrian linkages and connections on and off the street that promote an active and healthy lifestyle. The neighbourhood is well linked with adjacent Clearview North neighbourhood and the Waskasoo trail system. The trail system can also be easily linked to the future residential neighbourhood north of the treed ravine.

Within plan area:

- 100% all dwelling units are located within 400 m walking distance of a multi-use trail of at least 5 km in length.
- 100% of all dwelling units in the neighbourhood are located within a 400 metre walking distance of a park with active recreational facilities.
- Over 50% of the dwelling units are within 1 km walking distance of the planned school in Clearview North NASP via a controlled intersection to encourage walking.
- 100% of dwelling units are within 5 km of a commercial service area using an existing biking/multi-use trail.
- The playgrounds and active open space facilities are of at least 0.4 ha and within 800m walking distance from 100% of the dwelling unit entrances.

8.2 TRAILS

The trail system and linkages in the plan area have been designed to preserve current linkages and create new linkages. There is over 1.8 km of trail located within the municipal reserve and berm areas of Garden Heights. Refer to Map 4: Development Concept and Map 5: Development Concept Over Arial Photo.

The area provides access to the Waskasoo trail network. The plan strives to maintain the very popular circuit that starts at 67th Street and leads into the treed ravine area toward McKenzie Trails, follows along the river and loops up the hill along 67th Street. A public parking lot will be provided in the vista park north of the roundabout. This allows trail users to continue to park and access the trails. The parking lot will minimize public parking on local roads. Garden plot users can also use the parking lot.

A 2.5 metre meandering asphalt trail and an additional row of trees have been incorporated in to the 34 metre divided collector entrance. The objective is for trail users to feel like they never left the trail system as you enter in to the Garden Heights neighbourhood.

A trail will also follow along residences that back on to the ravine and escarpment between the top of bank and rear property lines. This multi-use trail will be a 2.5 metre paved trail. The perimeter trail links with 67th Street in the east and west forming a loop with connections to Clearview North residential and mixed-use commercial areas.

Park directional signage and rest nodes will be provided at key points along the trail. Section 13, Figure 1 is a cross section of the multi-use trail that extends along the perimeter of the neighbourhood and along the divided collector entrance.

A temporary trail will be constructed linking phase 1 to the 67th Street trail as shown on Map 4. The location is conceptual and may vary with approval of the Parks Department. This trail connection will be used until phase 5 is developed.

8.3 PARK SITES

Garden Heights is a non-typical quarter section development. As per the *Neighbourhood Planning Guidelines and Standards*, a non-typical neighbourhood is defined as a quarter section that has significant natural features identified for preservation which may make it difficult to incorporate all required amenities into the open space plan. There are 39.11 ha (96.6 acres) of environmental reserve which is 59% of the gross plan area.

Garden Heights has incorporated parkettes with an extensive trail system in the neighbourhood. A parkette is a 0.2 to 0.8 hectare (\pm 0.5 to 2.0 acres) site that may contain a tot lot playground, active and/or passive recreational components and trail systems.

A .34 ha (.84 acre) tot lot is centrally located in the eastern portion of the plan.

A .22 ha (.54 acre) junior playground is centrally located in the western portion of the plan. The junior playground is located at the T-intersection to act as a terminal vista for the multi family local road. The park will also absorb lights from vehicles at the intersection.

A central park is located north of the roundabout to create a green vista when entering the neighbourhood. This park is .32 ha (.79 acres) and contains a parking lot, garden plots and trail.

Park layouts and landscaping plans will be provided by the developer to the Recreations, Parks and Culture Department for review during the development agreement approval process. The detailed location of seating, tables, plants and tree species will incorporate CPTED (Crime Prevention Through Environmental Design) principles.

Due to the goal for environmental stewardship throughout this neighbourhood design, landscaping for park and open space areas will be based on naturoscaping. Naturoscaping is a method of using regional plants and tree species for landscaping that require little water and enhance the local ecosystem.

The roundabout will be landscaped as an entry feature which contributes to the eco-friendly community identity of the Garden Heights neighbourhood. The landscaping will be done carefully so as not to compromise safety and functionality of the roundabout.

8.4 POTENTIAL GARDEN PLOT SITE

Garden plots are an important community amenity as they bring residents together to grow food, enjoy the outdoors and socialize. The long term vision is that each neighbourhood has a community garden that is operated through either a community association or a community garden network. This removes the need to drive to a garden and provides an opportunity to bring residents of a neighbourhood together.

The potential community garden site would be developed by the neighbourhood community association and/or residents in Garden Heights. With the approval of administration, this site may be moved to another location within the neighbourhood without a NASP amendment.

It is anticipated there will be a need for 10-12 plots at this location. Each garden plot is planned to be approximately 1.2 metres by 9 metres (4 feet by 30 feet) and approximately .3 metres (1 foot) deep. Once access, compost and tool storage are incorporated a site approximately 890 m² (9,600 sqft) surrounded by a fence approximately 1.2 metres (4 feet) tall is required. The site set aside in Map 4: Development Concept for potential community gardens is approximately 900 m².

Access to water is imperative with community gardens. This garden site should be able to access water from the adjacent apartments or assisted living, temporary care, or day care site.

The location near a higher density development is favourable to provide gardening opportunities these higher density residents that do not have yard space. Sites that are clearly visible from a road and multiple residences assist in ensuring that park users feel safe. In addition ensuring that a site is set back an appropriate distance from natural areas (at least 10 meters) also assists in security.

9.0 SOCIAL HEALTH

9.1 SOCIAL IMPACT ASSESSMENT

A social impact assessment has been carried out by the Social Planning Department as part of the neighbourhood area structure plan referral process.

9.2 GATHERING PLACES

Gathering places are defined as a public or semi-public space located at a node, with or without a structure, and which creates opportunities for social contact. A major gathering place is situated where the multi-family residential site, trail, parking lot and potential garden plot sites all meet in the terminal vista park adjacent to the roundabout. This site is identified on Map 4: Development Concept. Details of the gathering place will be determined in the development agreement stage.

9.3 ASSISTED LIVING/DAYCARE/TEMPORARY CARE SITE

An assisted living, day care or temporary care site is provided west of the roundabout. The .14 ha (.32 acre) site was chosen for efficient access and close proximity to trails, transit, park space and the potential garden plots. This site will be designated Public Service (PS). The availability of the site will be advertised by the developer through local print media and The City web site (public notices) for a minimum of one year. If the site is not acquired within one year of advertising, it may revert to mixed residential (RI & RIA).

10.0 ROAD NETWORK

10.1 ROAD PATTERN

The single access point off of 67th Street collector conforms with the East Hill MASP. The looping collector proposed was impossible to construct due to area constraints; therefore, an alternative collector roadway pattern has been approved to the satisfaction of Engineering Department and does not require an amendment to the East Hill MASP. The road pattern with street labels for reference can be found in Map 4: Development Concept.

10.2 DIVIDED COLLECTOR ENTRANCE

The entrance (B Avenue) to the neighbourhood from 67th Street is aligned with the collector network of Clearview North. This all turns intersection will be controlled with traffic lights.

This 34 metre divided collector serves as the single access point in to the neighbourhood and carries traffic between the neighbourhood locals and 67th Street arterial. It also provides access options if one side of the roadway was to be closed due to an accident or servicing.

The well landscaped entrance is intended to reflect the 'garden' in Garden Heights. The grand green entrance provides a first impression of an eco-friendly neighbourhood.

Section 13, Figure 2 provides a cross section of the divided collector entrance. The right of way incorporates a treed median, 2.5 metre meandering asphalt trail, 1.5 metre separate sidewalks with treed boulevards and enhanced landscaping area adjacent to the residential. The noted intensified landscaping area on the boulevard is to soften the visual impact of the fence. A combination of large shrubs and trees will be planted to soften the street, screen fences and backyards that back on to the entrance.

10.3 ROUNDABOUT

The roundabout is located at the intersection of the 34 metre divided collector (B Avenue) and two local roads (E Street and A Close). This is an

intersection feature that will act as a vista when entering the neighbourhood. It will be landscaped and allow for snow removal.



High Street, UniverCity on Burnaby Mountain is a great example of a divided green entrance to a roundabout.



An example of a three way single lane roundabout.

Roundabouts are also an effective way to calm and control traffic flows. They also reduce vehicle idling. A roundabout can accommodate 25,000 vehicle movements per day.

Transit buses are only permitted on collector or larger roadways. The roundabout is an efficient way of moving transit buses north and south along the 34 metre divided collector entrance.

The basic elements of a typical single lane roundabout are shown in Section 13, Figure 8.

10.4 MULTI-FAMILY LOCAL ROAD

Multi-family locals form the eastern (E Street) and western (A Close) legs of the roundabout. Both streets are servicing over 100 lots; therefore, these roads are being built to a 17 metre multi-family local road standard with a 12 metre carriageway to handle the increased traffic flow. A collector standard was not required because there will not be any bus traffic on these roadways.

Refer to Section 13, Figure 3 for a cross section of the multi-family local road.

10.5 LOCAL ROAD

The majority of the road network is designed to a 15 metre local road standard (F Circle, C Close, G Close, and southern portion of A Close). This is a 10 metre carriageway with 1.5 metre sidewalks and 1 metre boulevard. Refer to Section 13, Figure 4 for a cross section.

A residential local roadway carries traffic with an origin or destination along its length and are not intended to carry through traffic. An undivided residential local roadway should not generally collect traffic from more than 100 dwelling units before connecting to a collector roadway.

On the west side of the plan is a looping local road network (F Circle) that serves approximately 100 dwelling units. The dwelling units are divided between the two parallel local roadways that theoretically serve 50 dwelling units each as the shortest route out of the neighbourhood is most often chosen. C Close contains approximately 30 units that are served by a local road.

On the east side of the plan, the southern portion of A Close and G Close are local roads. The multi-family local portion of A Close will taper to a local road as the road curves to the south. The local road portion of A Close serves less than 100 units.

10.6 EAST FUTURE COLLECTOR ROAD EXTENSION

It is noted on Map 4: Development Concept with a dashed line that the collector stemming from the mixed use commercial area in Clearview North aligns to the east of the treed ravine. This is an all turns intersection with traffic lights. It is a high priority for City administration that minimal to no intervention occurs in the treed ravine area. A cross section of the future collector road extension is illustrated in Section 13, Figure 5.

The following conditions have been agreed to by the land owner/developer relating to the future collector road extension from Clearview North adjacent to the ravine:

1. No utilities will be planned for the west side of the proposed roadway as they will have a significant impact on the existing natural area.
2. The roadway will be constructed with a combination of natural material and geo-fabric to provide for a steeper side slope thereby mitigating slope and fill damage to the natural area. This slope will not be mowed or maintained, it is simply to become a natural extension of the park.

3. Creation of a reclamation area north of the ravine, west of the road be dedicated and planted with natural material to ensure that the existing overall footprint and functionality of the park land remains.
4. The west sidewalk will be replaced with a 2.5 metre asphalt trail.
5. Silt fencing to be installed during the construction of the roadway to mitigate any erosion and soil impacts to the ravine.

10.7 LANES

Lanes provide access to the rear of the residential lots. Lanes are also the preferred location for rear services to maintain good local road conditions. The maximum length of a lane before it connects to a street should not exceed 350 metres. The longest lane in Garden Heights is part of the alternate land use for the green development which is 350 metres.

Where the number of units exceeds 60 then a paved lane may be required by the developer. Paved lanes or a more sustainable alternative may be required in the green development and R2 land use districts.

10.8 TRANSIT

Due to the size and access constraints of the neighbourhood, transit service was a challenge. The result is that 97% of the area is within 400 meters of a transit stop. Less than 20 single family residential lots are outside of the 400 metre radius with the furthest being about 100 metres from a transit stop. Transit routing will conform to City of Red Deer standards and local transit routes will service the neighbourhood via the collector system.

10.9 UTILITY RIGHT OF WAY (BERM)

A noise study was conducted for Garden Heights in May of 2008. The study used a theoretical model using the current city population and a projected 115,000 population horizon. The result from this investigation was that the projected volumes would exceed the allowable levels and therefore some form of noise attenuation would be required.

The noise study recommends a 20 metre wide by 2 metre tall berm that will run adjacent to the 67th Street right of way to mitigate noise. The berm will be constructed of waste fill from the area. The berm will be situated in the current gravel road right of way and contain the existing power lines. The south facing slope of the berm will vary with the slope of 67th Street right of way to ensure existing trees are preserved. Where the slope of the berm is greater than 3 to 1 ratio, it will be returned to natural planting and as it is too steep to mow with equipment.

Section 13, Figure 6 depicts the berm to the east of the entrance. Section 13, Figure 7 depicts the berm to the west of the entrance.

11.0 SERVICING

Garden Heights will be serviced from 67th Street. There is currently an existing storm and sanitary sewer mains with sufficient depth and capacity to service this subdivision by gravity. Water service will come from the Clearview North subdivision by extending two stubs across 67th street at some point along the boundary of Garden Heights. Maps 6 through 9 illustrate the servicing concepts for Garden Heights.

11.1 STORM SEWER SYSTEM

All storm water management will be in accordance with the Best Management Practice outlined within the *Alberta Environment Standards and Guidelines for Storm Water Management* in the Province of Alberta. Due to the topography of the site, a single storm detention pond will be required and located along the north boundary adjacent to the ravine. This pond will service the entire plan area. The pond will outlet into an existing storm trunk located along 67th Street. There are several manholes along 67th Street, and depending on the required grade, the tie in will be chosen. This storm trunk carries on west and eventually outlets into the Red Deer River. Future urban development (A1) parcels north of the McKenzie ravine will be serviced from the east.

11.2 MINOR DRAINAGE SYSTEM

Runoff from storms up to a one in five year event will be handled via a gravity piped system. The piped system will consist of catch basins and catch basin manholes to collect runoff and route the runoff to a storm water management facility and then to the storm trunk line. A stub will be installed from the street into the swale along the east boundary, adjacent to the ravine, to provide a drainage point for this area. A weeping tile drainage system will be provided for each lot. The design will be completed in accordance with *The City of Red Deer Engineering Services Design Guidelines*. Map 7: Storm Water Mains illustrates the conceptual layout for the storm servicing.

11.3 MAJOR OVERLAND DRAINAGE SYSTEM

In areas serviced by the underground storm water conveyance system, runoff from storms larger than 5 year event will be routed via the lanes and roadways.

To accommodate this situation, roads and lanes will be designed to route the majority of the overland flow runoff to the storm detention pond. Some ponding will occur within the roads, lanes and municipal reserve areas. The detailed design process will ensure that the major overland drainage system is designed in accordance with *The City of Red Deer Engineering Services Design Guidelines*. Routing of the major storm system and the 100 year flood event can be seen in Map 6: Major Overland Drainage.

Lots backing on to the escarpment and ravine areas will have drainage swales or similar drainage controls to prevent sheet flow from backyard areas draining over the crest of the ravine. A drainage swale plan is developed in the next phase of servicing detail.

Measures will be put in place to ensure that if extra flow in to the ravine is needed, once storm water from the Clearview North neighbourhood has stopped, that water can be let in to the ravine from the pond at a controlled rate to ensure that the small series of wetlands at McKenzie Trails remain in tact. This will be monitored by The City.

11.4 SANITARY SEWER SYSTEM

The sanitary sewer system required to service the subject lands will tie into the Waskasoo regional trunk system located along 67th Street. The trunk is a 600mm, and has sufficient capacity to handle the flows from this site. Internal servicing and the tie in location is shown on Map 9: Sanitary Sewer Mains. Future urban development (A1) parcels north of the McKenzie ravine will be serviced from the east.

All facilities required for the sanitary sewer system will be designed in accordance with *The City of Red Deer Engineering Services Design Guidelines*.

11.5 WATER DISTRIBUTION SYSTEM

The water distribution system required to service the subject quarter section is a direct extension of the water distribution system for the Clearview North subdivision to the south of Garden Heights. Two water mains will cross 67th Street to service Garden Heights. These lines will form the water loop required for the subdivision. Future urban development (A1) parcels north of the McKenzie ravine will be serviced from the east and from the stub provided at the north central section of Garden Heights.

Computer water modeling will be utilized to evaluate actual water main sizes within the subject quarter section. Map 8: Water Mains illustrates the conceptual layout for water servicing.

11.6 SHALLOW UTILITIES

Shallow utilities, including The City of Red Deer Electric Light and Power Department, Shaw Cable, Telus Corporation, and ATCO Gas, are all located in the bordering subdivisions. It is anticipated that extension of these utilities will not be difficult.

11.7 ELECTRIC, LIGHT AND POWER

The plan is in proximity to the Gaetz Lakes Sanctuary. In order to preserve and protect the environmental integrity and unique character of the Gaetz Lakes, a full cutoff street light fixture which prevents light projection above the horizon will be installed. This will reduce ambient lighting from the proposed development to reduce development impact on nocturnal environments.

11.8 ATCO PIPELINE

An ATCO high pressure gas pipeline is located along the southern boundary of the plan just north of the power lines. The plan is based on the preferred option of moving the pipeline south in to the berm. With the Engineering Departments' approval, the pipeline may remain in its current location and the plan shift marginally (8 metres or less) to the north. This will not affect road pattern or land use types. The public utility lot will be widened.

12.0 IMPLEMENTATION

12.1 PHASING

Map 10: Phasing shows the phasing boundaries conceptually and may vary from those shown at the time of redistricting and subdivision. As well portions of a separate phase may be developed concurrently if there is sufficient demand or if servicing is made more efficient as a result.

Two top soil stock piles have been identified at the west side of the green development and on the junior park site.

In stripping of the topsoil in phase 1 and 3, a soil berm will be constructed around the perimeter to protect the ravine and prevent any drainage in to the ravine. The chain link fence being provided by the developer will be installed prior to construction on the lots to protect grades and ensure proper drainage.

In phase 1 a temporary trail will be constructed linking phase 1 to the 67th Street trail as shown on Map 4. The location is conceptual and may vary with approval of the Parks Department. This trail will be removed with the construction of phase 5.

In phase 3, the former well site at LSD 02-27-38-27-W4, although showing no visual indication of contamination or environmental impacts, will have the well head located, prior to stripping and grading, and a limited soil investigation be performed to determine if there is any indication of contamination. As well the surface soil at the AST (above ground storage tank) site will be removed during pre-grading which should remove any hydrocarbon impacted soils.

12.2 REDISTRICTING AND SUBDIVISION

Zoning and subdivision applications shall conform to the land use districts described in the NASP and guided by the regulations of the *Land Use Bylaw* and *Municipal Government Act Subdivision and Development Regulations*.

12.3 PLAN AMENDMENTS

An amendment to the adopted NASP is required for changes that stray from the intent of the plan such as:

- any change in proposed land uses;
- the elimination or addition of any public road or lane, or reclassification of a road unless contained in the multi-family or green development site;
- to reflect a change in other documents affecting planning and land use in the area (such as an amendment to a major area structure plan);
- changes to local roadways or lanes;
- minor road, lane or public utility lot deletions and/or additions;
- the addition or deletion of lots intended for the development of two-storey homes with walkout basements; and/or
- amendments necessary for the plan conform to a major area structure plan.

I 3.0 FIGURES AND MAPS INDEX

Figure 1: Cross Section of 2.5 m Multi-Use Trail

Figure 2: Cross Section of 34 m Divided Collector Entrance

Figure 3: Cross Section of 17 m Multi-family Local Road

Figure 4: Cross Section of 15 m Local Road

Figure 5: Cross Section of Future Collector Road Extension

Figure 6: 67th Street Berm, Section A-A

Figure 7: 67th Street Berm, Section B-B

Figure 8: Roundabout

Map 1: Plan Area

Map 2: Existing Conditions

Map 3: Existing Use

Map 4: Development Concept

Map 5: Development Concept with Aerial

Map 6: Major Overland Drainage

Map 7: Storm Sewer Mains

Map 8: Water Mains

Map 9: Sanitary Sewer Mains

Map 10: Phasing

Figure 1: Cross Section of 2.5 m Multi-Use Trail

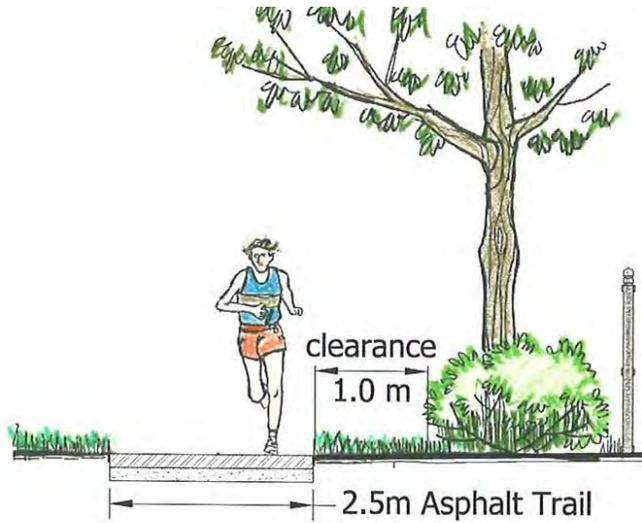
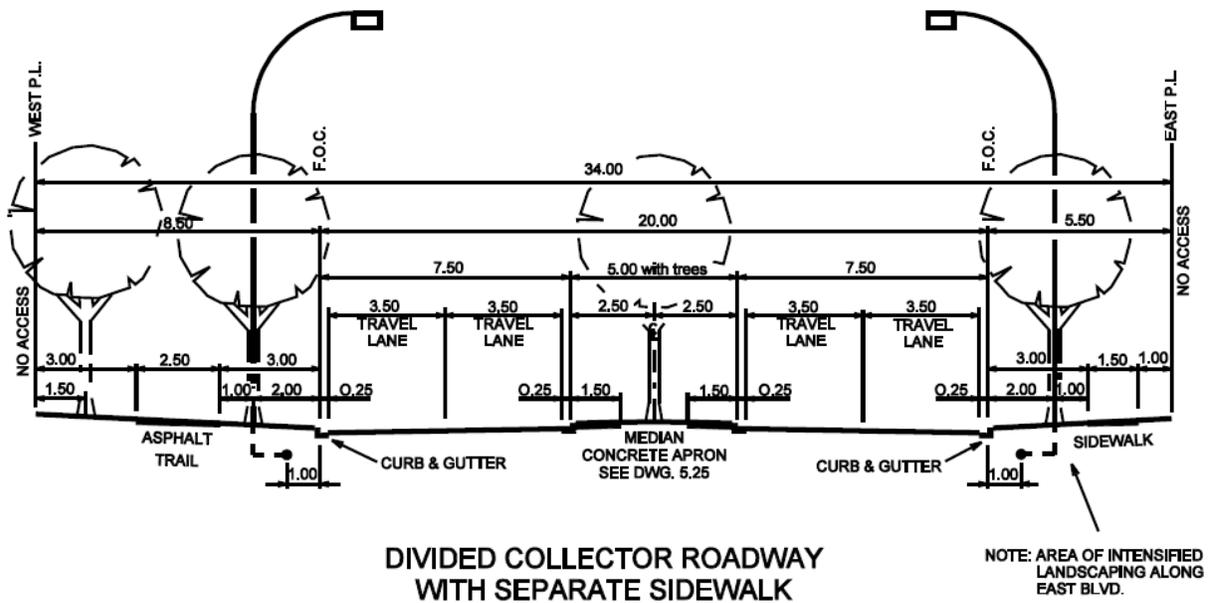


Figure 2: Cross Section of 34 m Divided Collector Entrance (B Avenue)



NOTE: ROLLED CURB AND GUTTER TO BE INSTALLED ON ROADWAYS WITH FRONT DRIVEWAYS, OTHERWISE STANDARD CURB AND GUTTER IS REQUIRED.

Figure 3: Cross Section of 17 m Multi-family Local Road (E Street & portion of A Close)

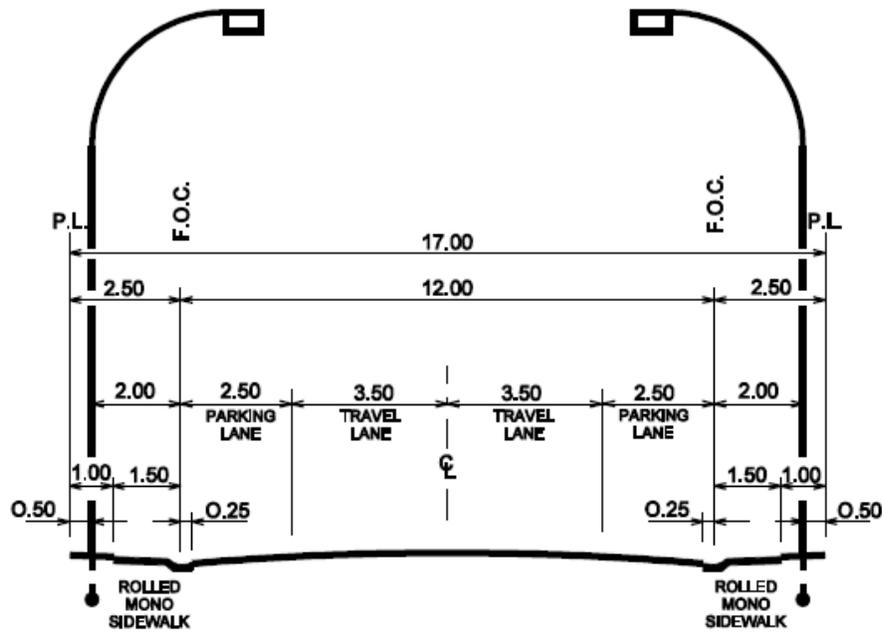


Figure 4: Cross Section of 15 m Local Road (F Circle, C Close, G Close & portion of A Close)

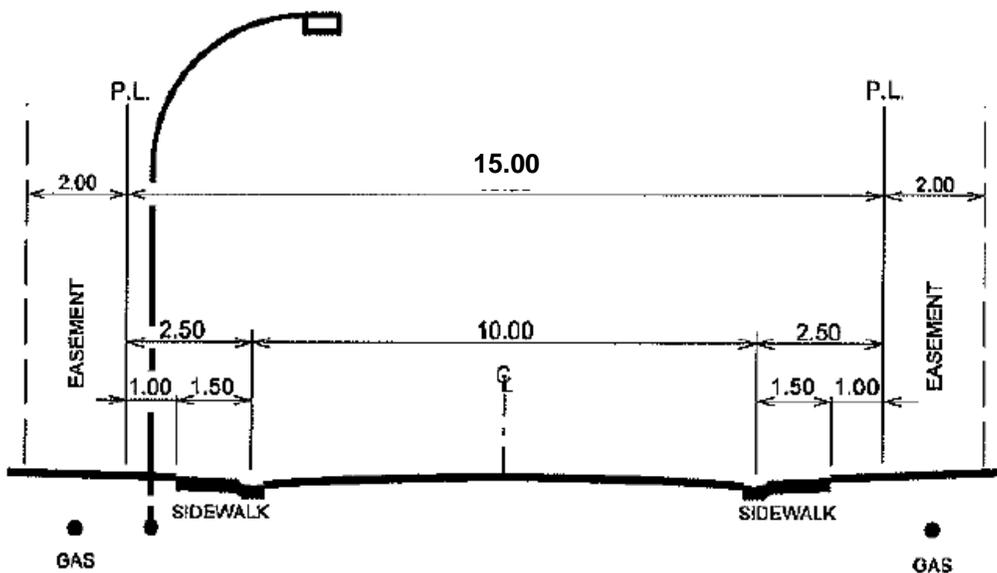


Figure 5: Cross Section of Future Collector Road Extension

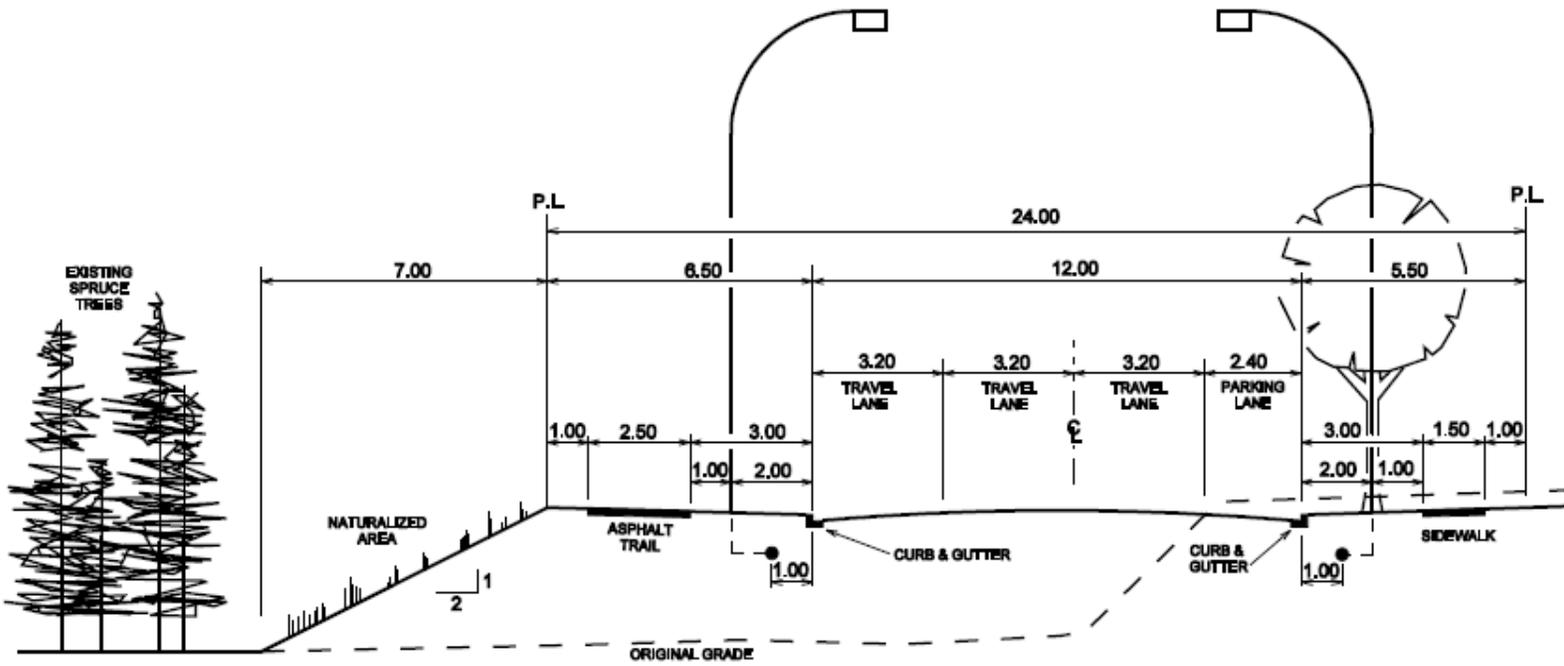


FIGURE 6: 67 STREET AND BERM CROSS-SECTION SECTION A-A

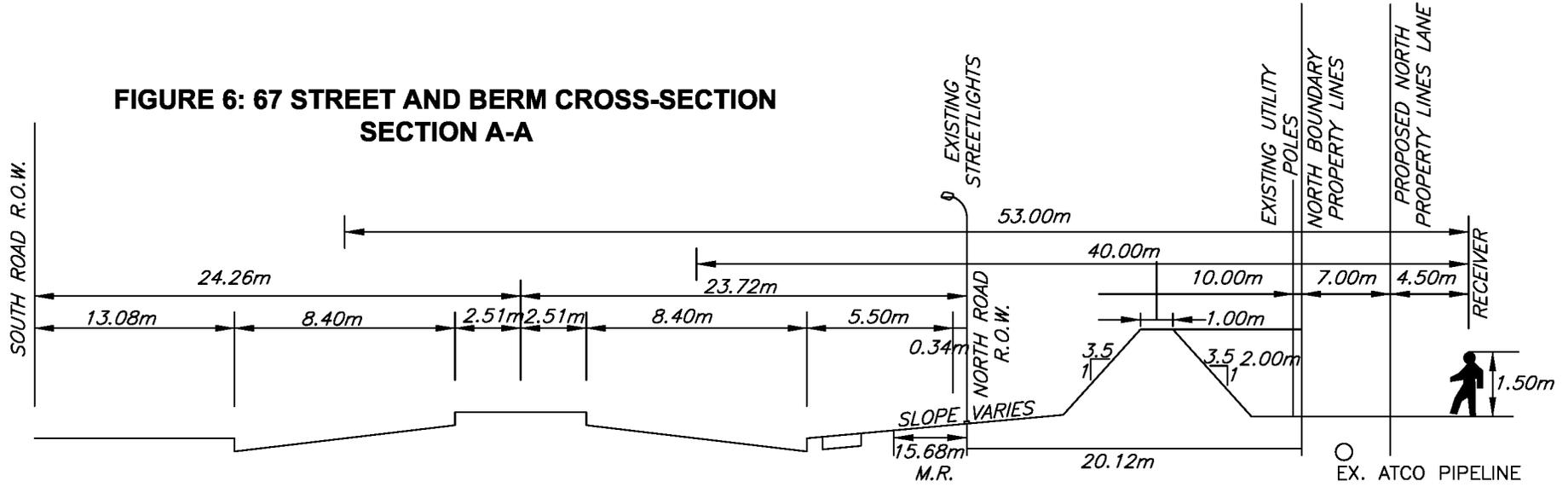
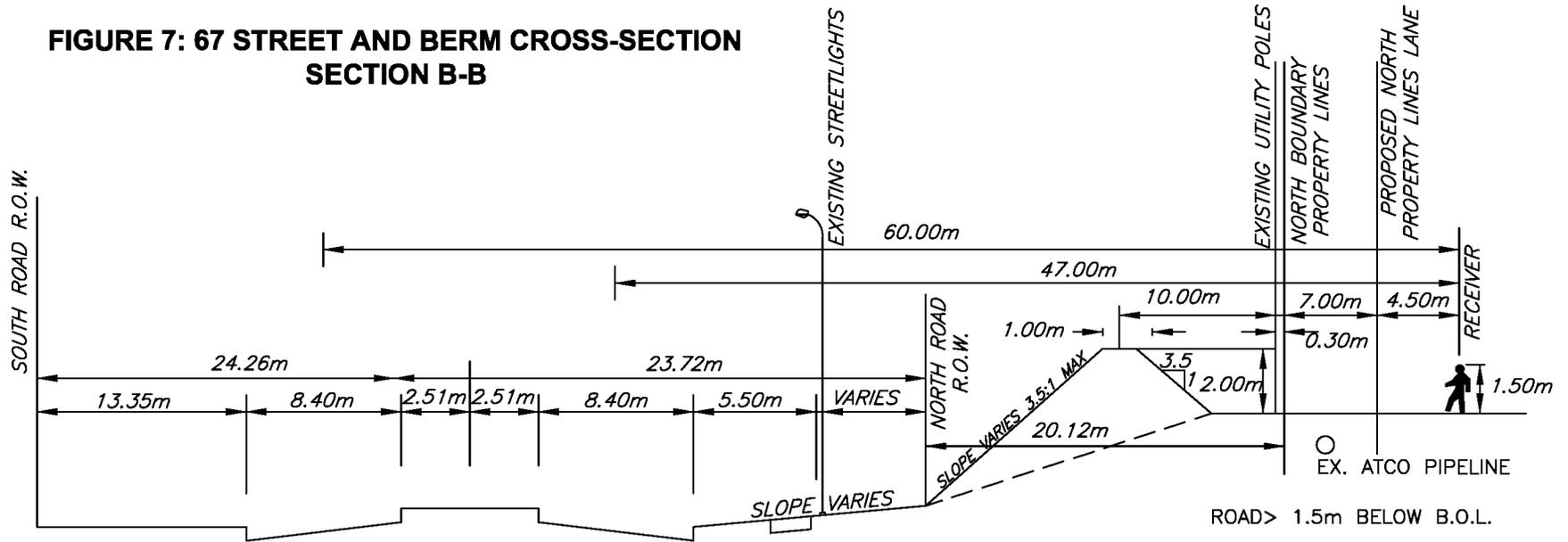
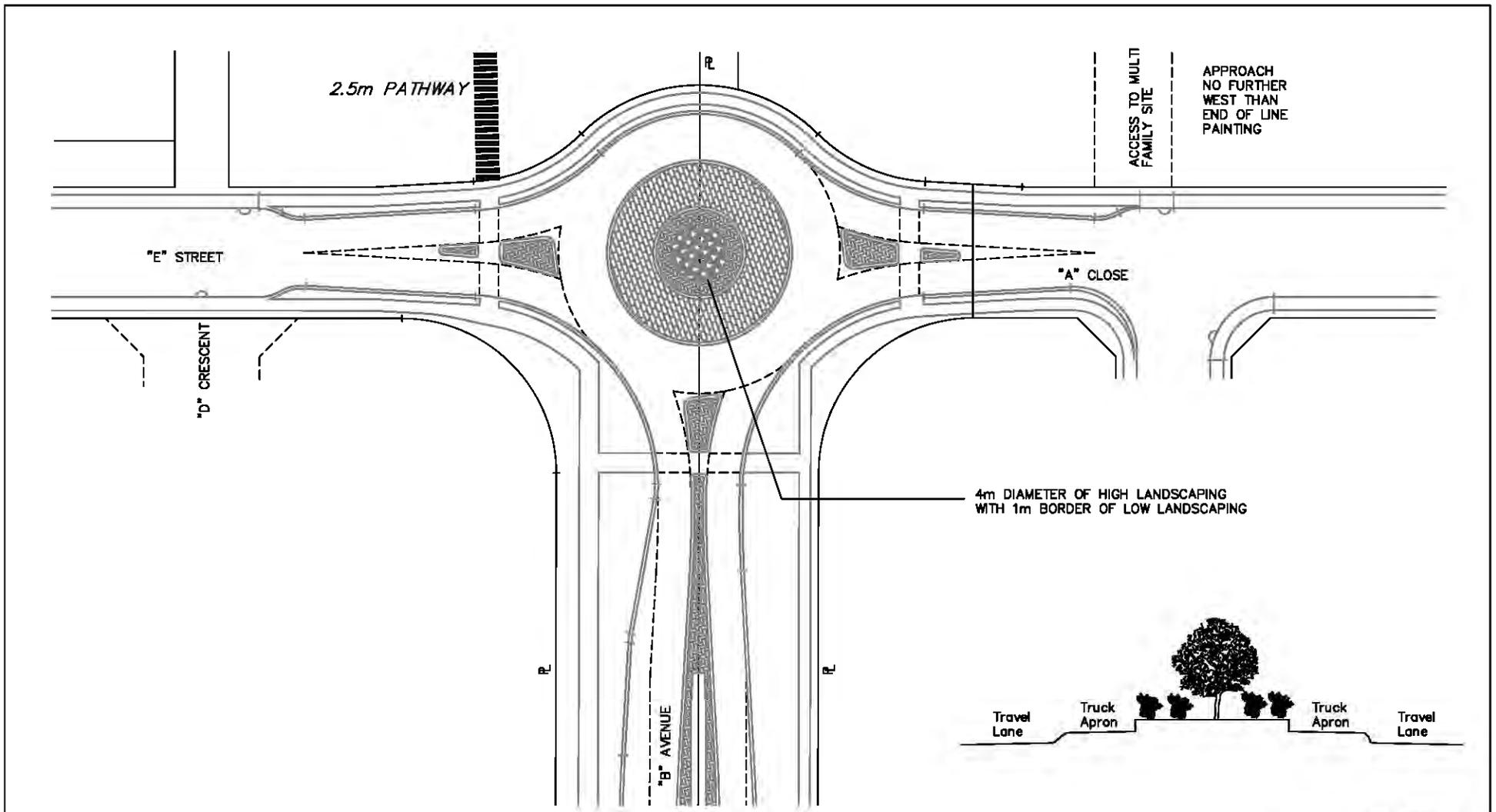


FIGURE 7: 67 STREET AND BERM CROSS-SECTION SECTION B-B

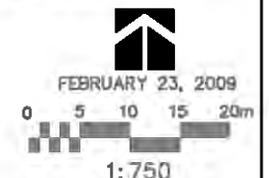




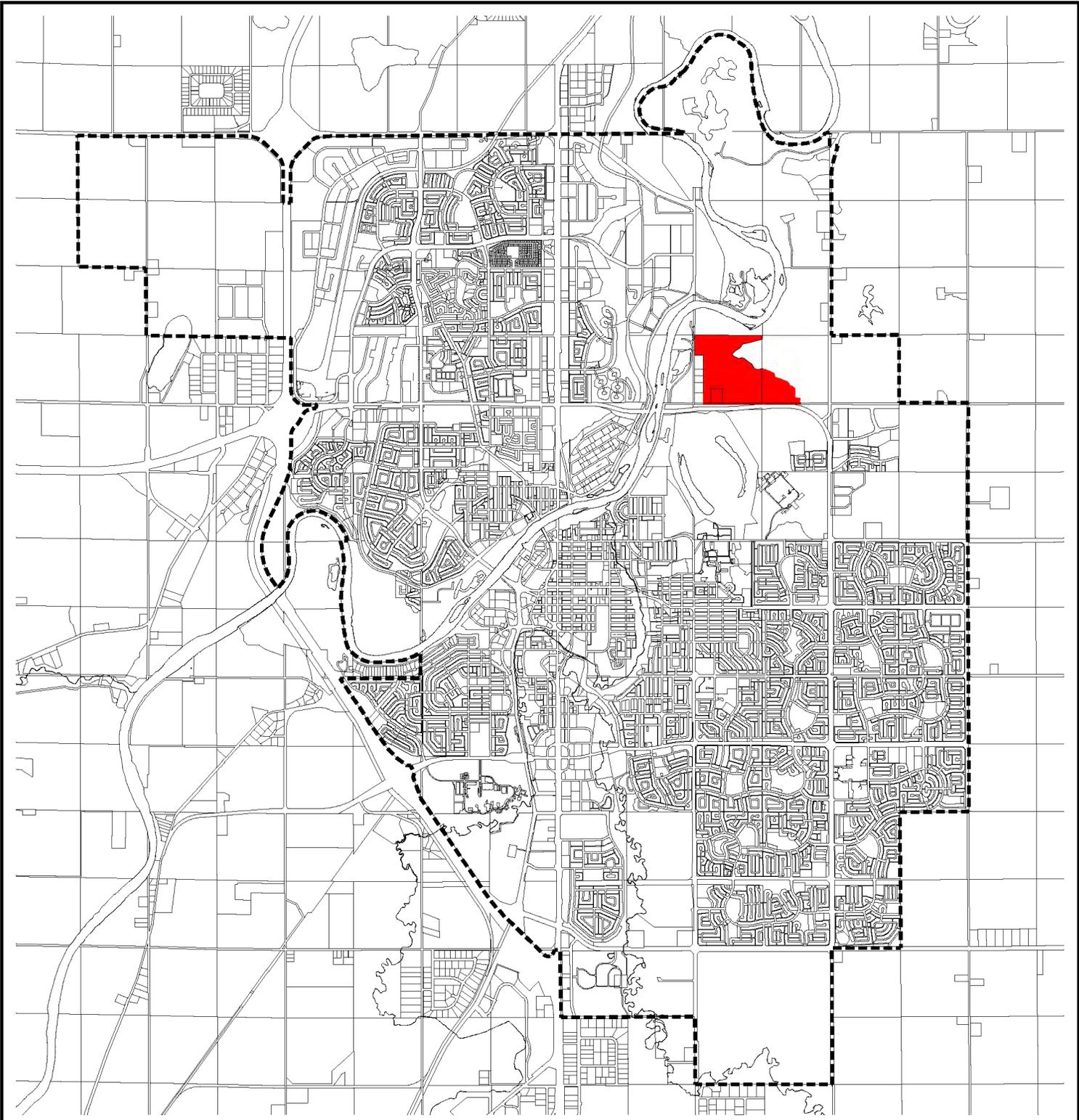
CITY OF RED DEER
Garden Heights Neighbourhood Area Structure Plan

-  RAISED CONCRETE SPLITTER ISLAND
-  MOUNTABLE TRUCK APRON
-  RAISED LANDSCAPED CENTRAL ISLAND

FIGURE 8
 Single Lane Roundabout Concept



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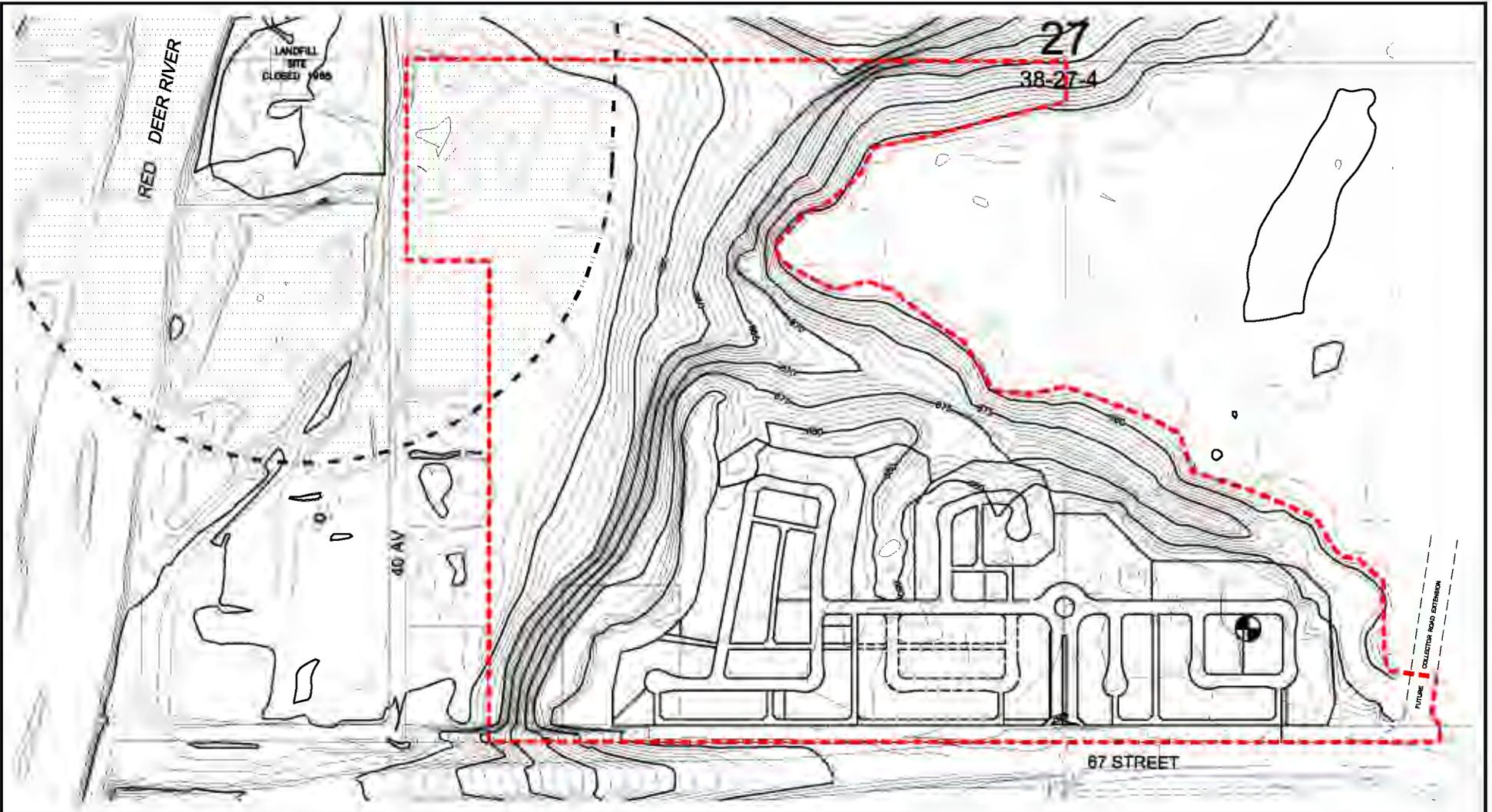
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MAP 1
Plan Area

-  **PLAN AREA**
-  **CITY BOUNDARY**



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Garden Heights Neighbourhood Area Structure Plan

MAP 2
Existing Conditions

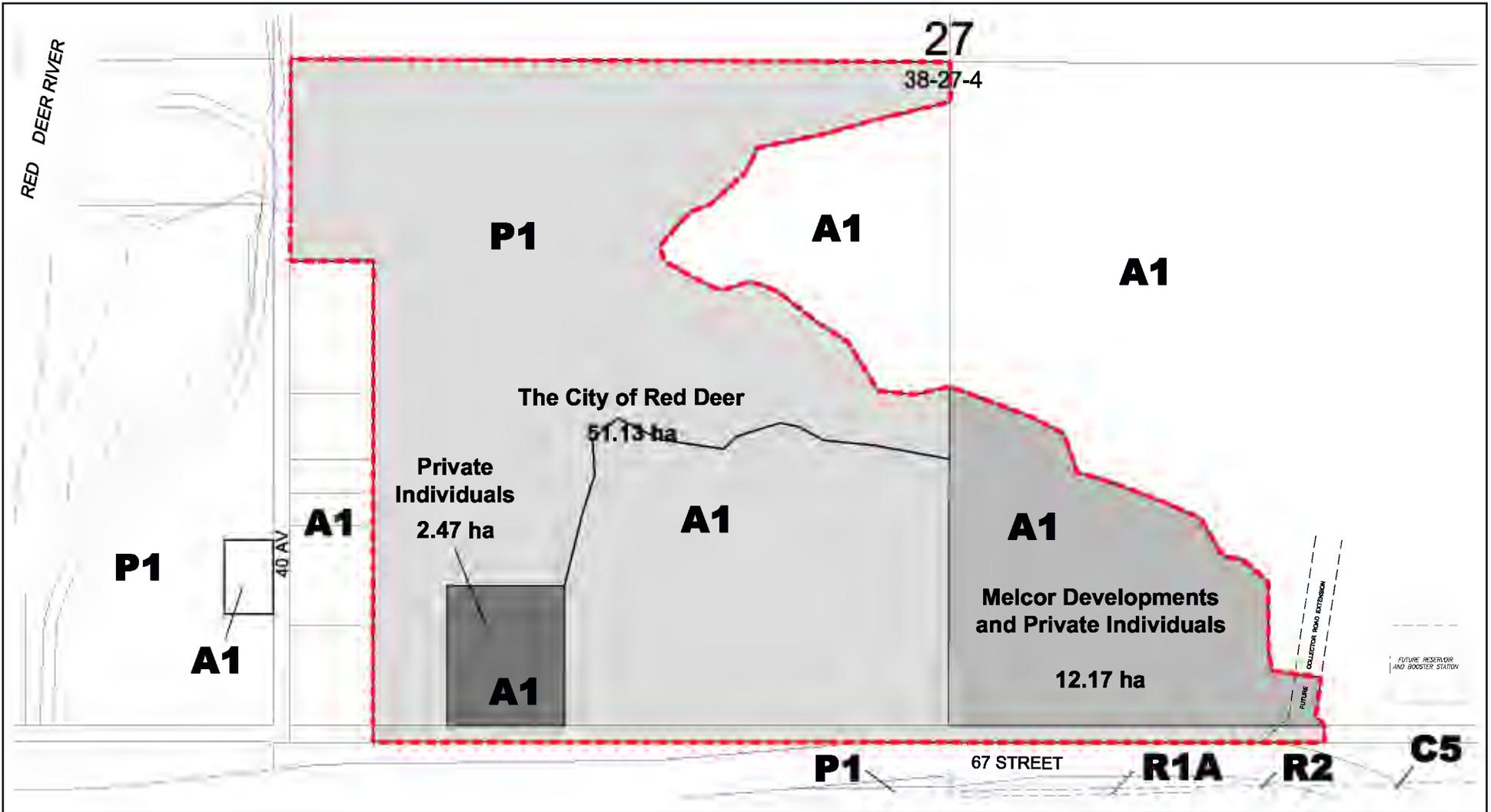
-  **PLAN BOUNDARY**
-  **CLOSED LANDFILL SETBACK - 300m radius**
-  **ABANDONED WELL SITE - 15m radius**



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Garden Heights Neighbourhood Area Structure Plan

MAP 3
Existing Use

-  **PLAN BOUNDARY**
-  **LAND OWNERSHIP BOUNDARY**

LAND USE BYLAW

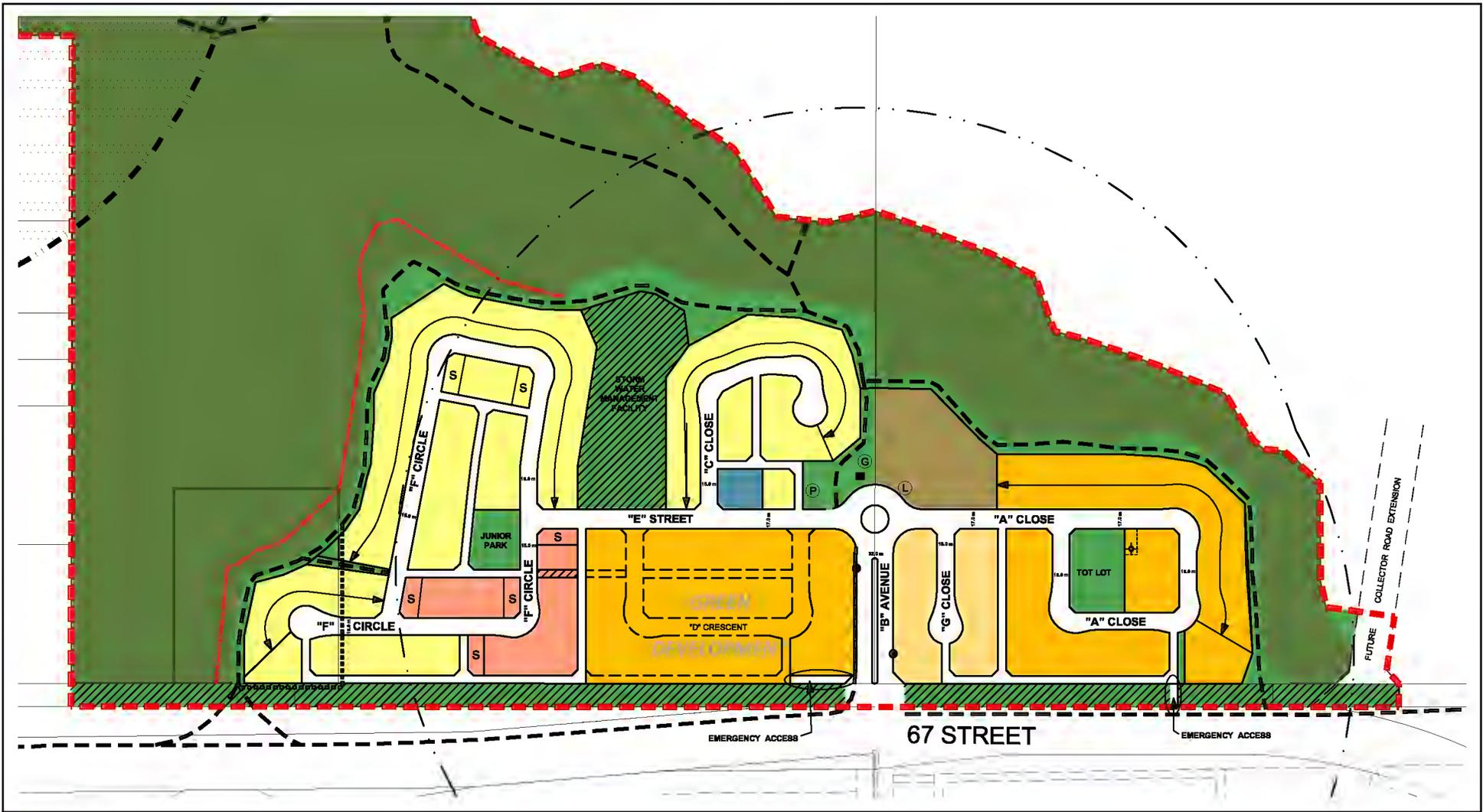
- A1 - FUTURE URBAN DEVELOPMENT DISTRICT**
- P1 - PARKS & RECREATION DISTRICT**
- R1A - SEMI-DETACHED RESIDENTIAL DISTRICT**
- R2 - MEDIUM DENSITY RESIDENTIAL DISTRICT**
- C5 - TOWN CENTRE COMMERCIAL DISTRICT**



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Garden Heights Neighbourhood Area Structure Plan

MAP 4
Development Concept

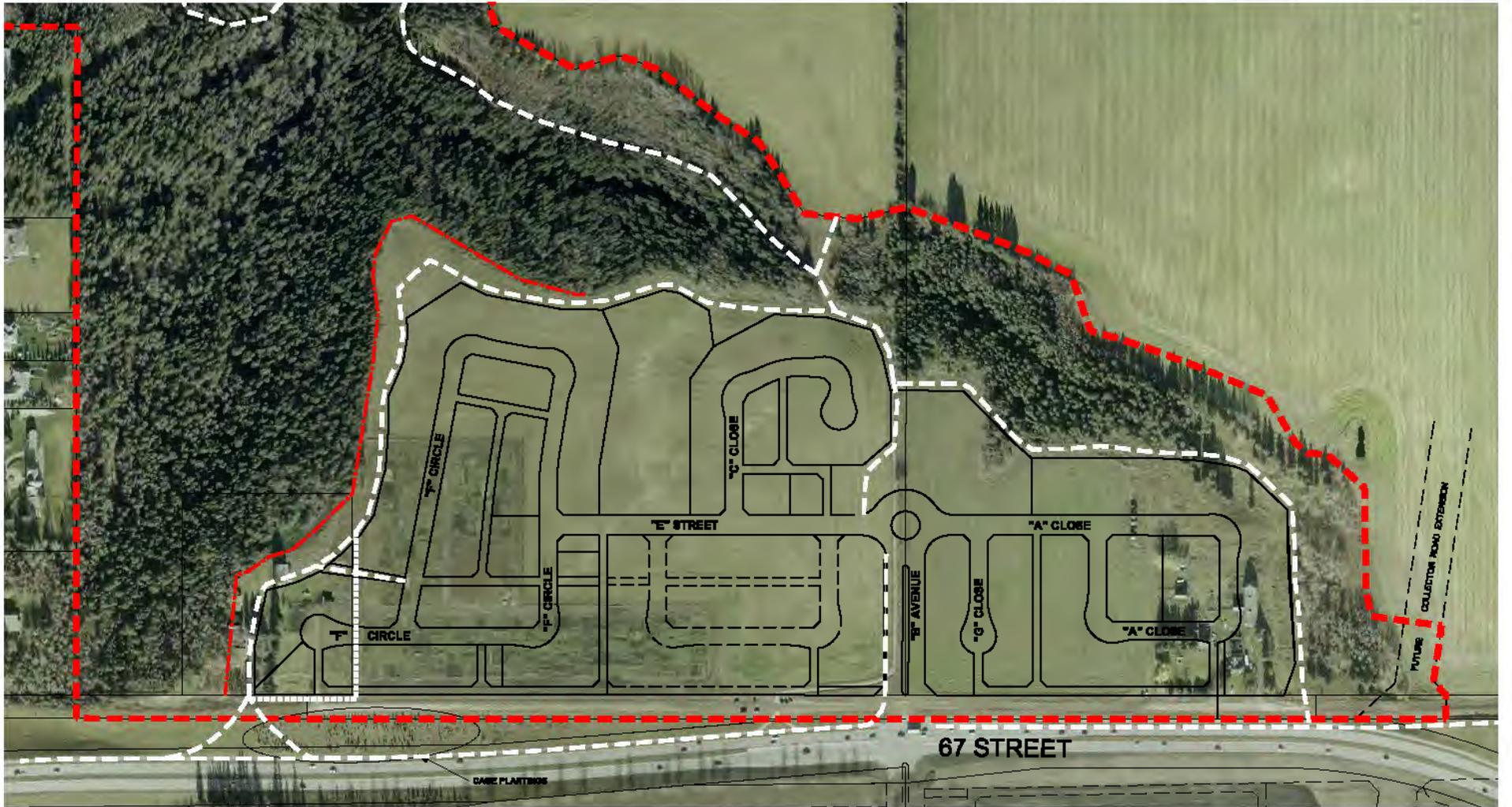
- | | | |
|--|--|--|
| PLAN BOUNDARY - 65.77 ha | MAJOR TRAIL/ PATHWAY | CLOSED LANDFILL SETBACK - 300m |
| SINGLE FAMILY RESIDENTIAL (R1) | TEMPORARY TRAIL/ PATHWAY | TOP OF ESCARPMENT |
| SEMI-DETACHED RESIDENTIAL (R1A) | POSSIBLE TWO-STOREY W/ WALKOUT BASEMENT | ABANDONED GAS WELL - w/10 x 15m working area, to be used for surface parking or open space with permeable surface only |
| MIXED RESIDENTIAL (min. 50% R1; min. 35% R1A) | TRANSIT STOP/ SHELTER | |
| MEDIUM DENSITY RESIDENTIAL (R2) | TRANSIT STOP 400-m SERVICE AREA | |
| MULTIPLE FAMILY RESIDENTIAL (R3) | GATHERING PLACE | |
| ASSISTED LIVING/ DAYCARE/ TEMPORARY CARE SITE (PS) | POTENTIAL COMMUNITY GARDEN PLOTS | |
| PARK/ OPEN SPACE (P1) - 3.85 ha (15.7 %) | PUBLIC PARKING AREA | |
| PUBLIC UTILITY | ADDITIONAL LANDSCAPING REQUIREMENTS (see text) | |
| ENVIRONMENTAL PRESERVATION (A2) - 39.11 ha | POSSIBLE SECONDARY SUITE DEVELOPMENT | |

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Garden Heights Neighbourhood Area Structure Plan

MAP 5
 Development Concept with Aerial

-  **PLAN BOUNDARY**
-  **MAJOR TRAIL / PATHWAY**
-  **TEMPORARY TRAIL / PATHWAY**
-  **TOP OF ESCARPMENT**


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Garden Heights Neighbourhood Area Structure Plan

→ OVERLAND DRAINAGE ROUTE

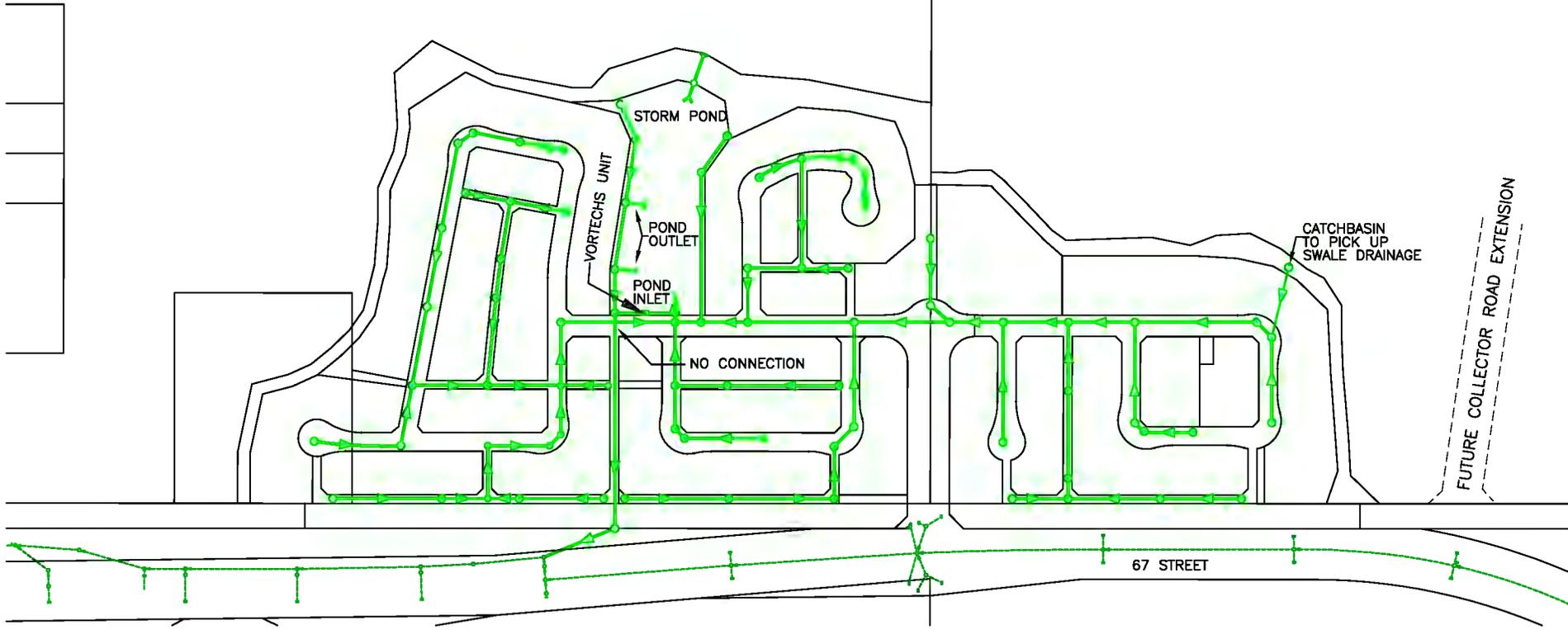
MAP 6
Major Overland Drainage

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-  PROPOSED STORM MAINS
-  EXISTING STORM MAINS

MAP 7
Storm Sewer Mains



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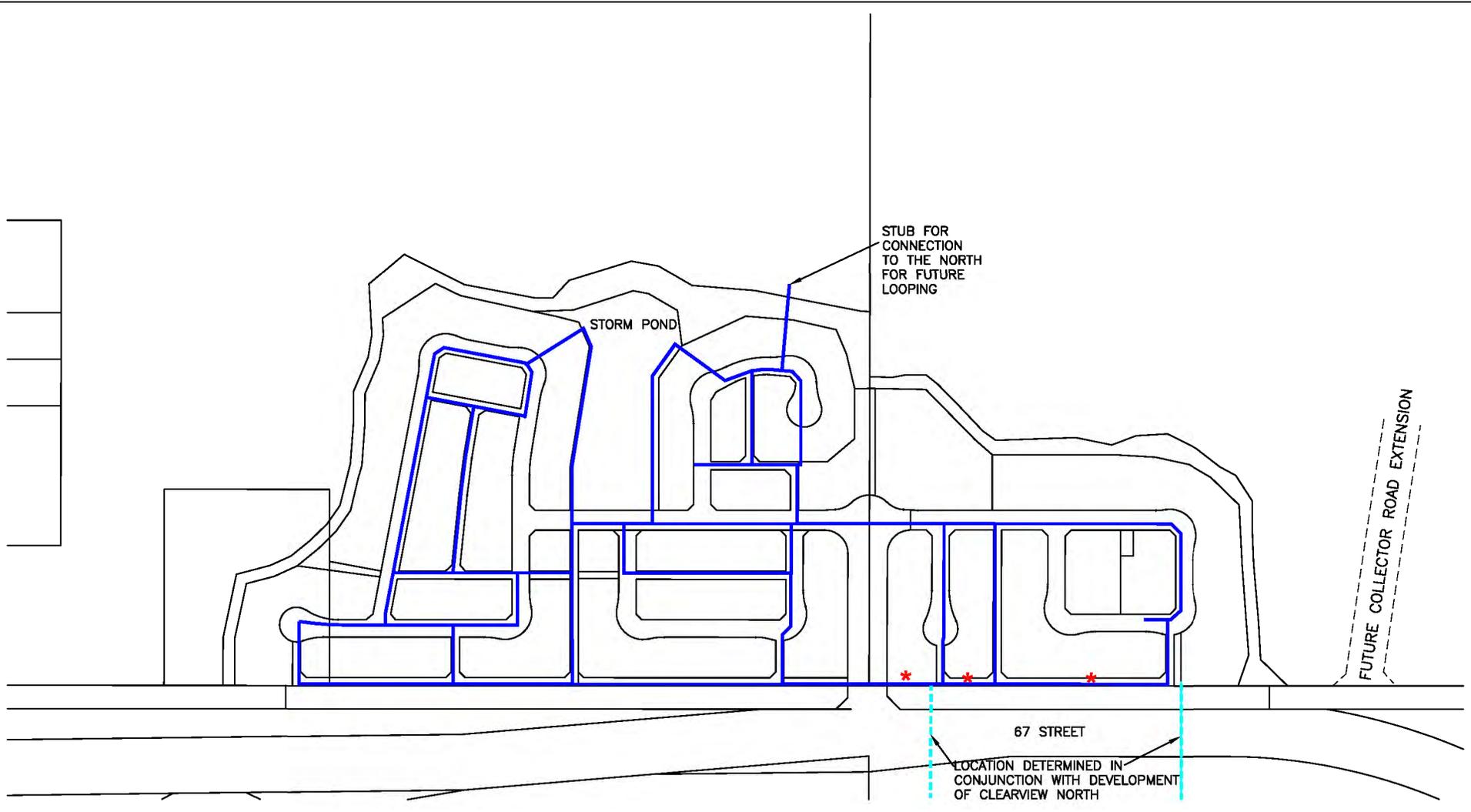
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-  PROPOSED WATER MAINS
-  EXISTING WATER MAINS
-  WATER MAINS THAT ARE INSTALLED AS PART OF PHASE 1 THAT ARE NOT WITHIN THE PHASE 1 BOUNDARY

MAP 8
Water Mains

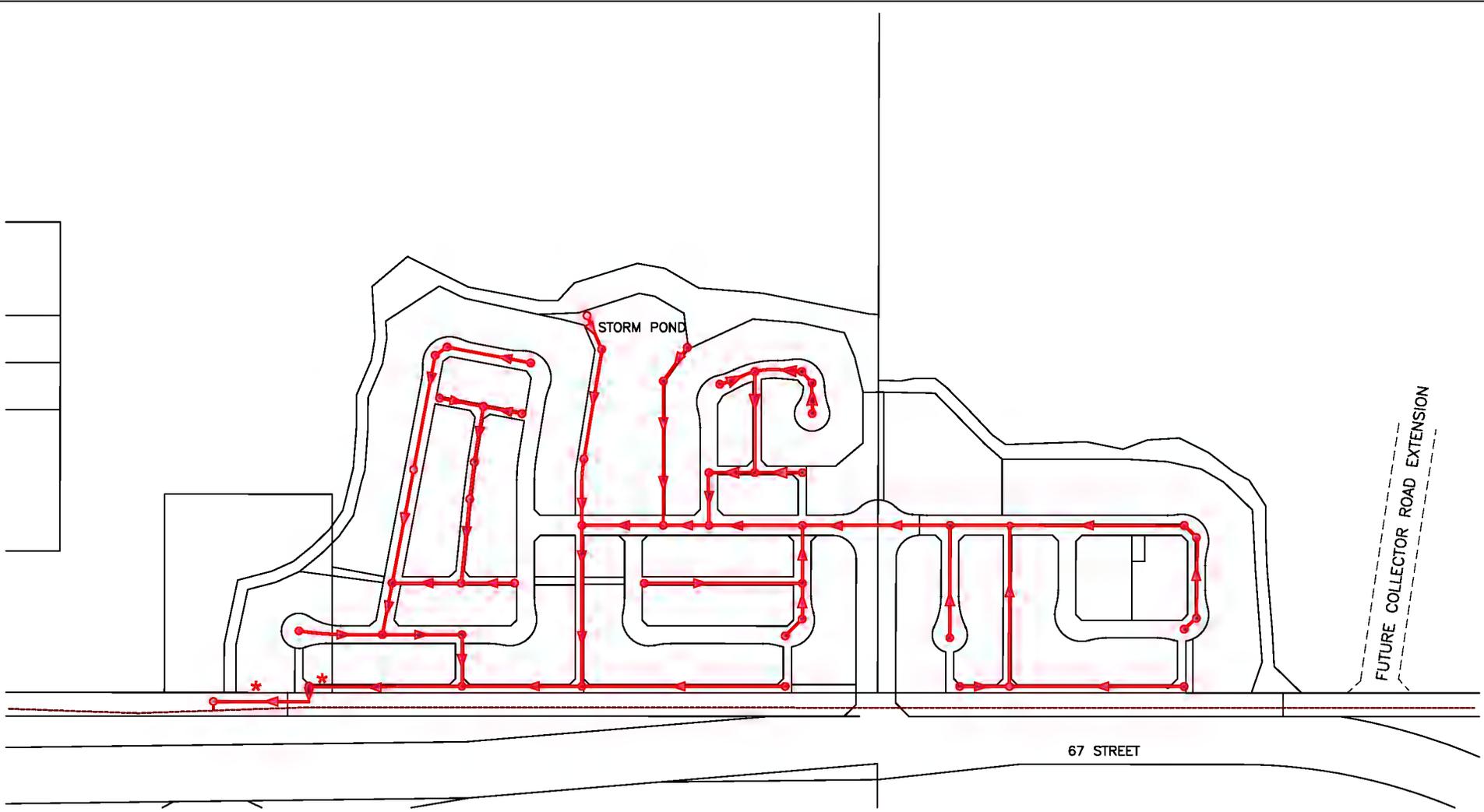
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PROPOSED SANITARY MAINS
 EXISTING SANITARY MAINS

SANITARY MAINS THAT ARE INSTALLED AS PART OF PHASE 1 THAT ARE NOT WITHIN THE PHASE 1 BOUNDARY

MAP 9
Sanitary Sewer Mains



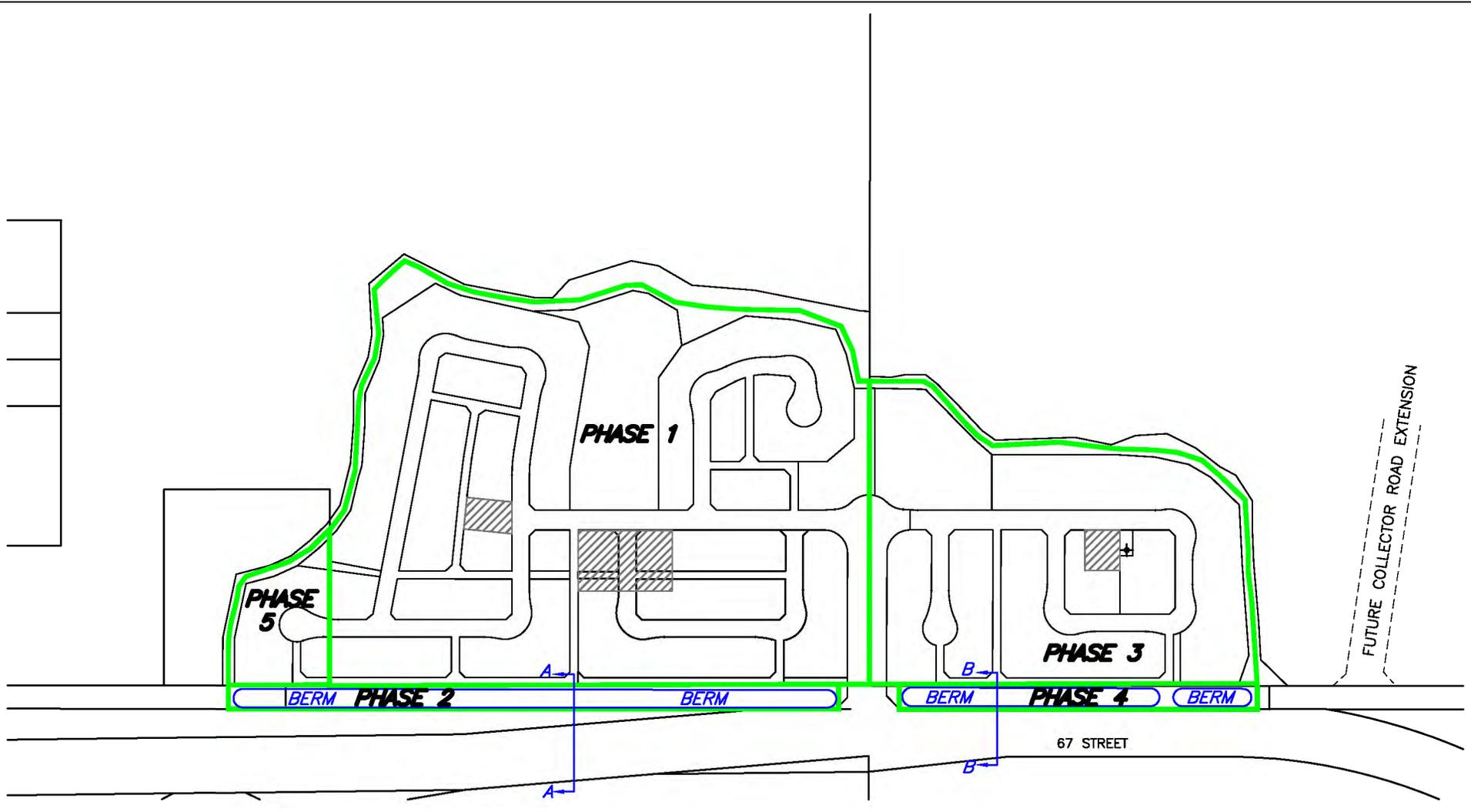
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CITY OF RED DEER
Garden Heights Neighbourhood Area Structure Plan

- █ PHASE BOUNDARY
- TOPSOIL STOCKPILE AREA
- + ABANDONED GAS WELL

MAP 10
Phasing



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