

SUNNYBROOK SOUTH
NEIGHBOURHOOD AREA STRUCTURE PLAN

SE 1/4 SECTION 4, TOWNSHIP 38, RANGE 27, WEST OF 4

Bylaw No. 3217 / B - 2008
(Adopted February 25, 2008)

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Prepared For:
Melcor Developments Ltd.

Prepared By:
Al-Terra Engineering Ltd.

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1.0 INTRODUCTION AND PURPOSE

The subject site is located in the south quadrant of the City of Red Deer at the intersection of 19th Street and 40th Avenue, and can be seen in Figure 1. Immediately to the west is the existing Bower area. To the east is the Inglewood West area. To the north is the future 22nd Street arterial road right of way. To the south are 19th Street and then the City of Red Deer's former landfill site.

The site is situated within the study area boundary of the East Hill Area Structure Plan adopted by Council on September 14, 1992 by Bylaw 3075/92, with subsequent revisions by Bylaw 3075/A-93, 3075/B-93, 3075/A-97, 3207/98, 3217/D-04, and 3208/A-2005.

The site, containing 153.18 acres (61.99 hectares) more or less, is legally described as the Southeast ¼ Section 4, Township 38, Range 27, west of the 4th meridian.

AL-Terra Engineering Ltd. is submitting this Neighbourhood Area Structure Plan on behalf of Melcor Developments Ltd. The plan submitted acknowledges the presently known edge conditions on all four sides of the site.

The following sections of this report discuss: policy framework, site characteristics, proposed land uses, development densities, municipal reserve and open space requirements, transportation considerations, proposed site servicing and phasing.

2.0 POLICY FRAMEWORK

On September 14, 1992 City of Red Deer Council adopted the East Hill Area Structure Plan (Bylaw 3075/92). Subsequent revisions were made to the Plan by Bylaw 3075/A-93 on April 26, 1993, by Bylaw 3075/B-93 on November 22, 1993, Bylaw 3075-97 on January 26, 1998, Bylaw 3207/98 on April 20, 1998, and Bylaw 3207/A-2005 on December 19, 2005. The Area Structure Plan allows for the primary use of land for residential purposes based upon an anticipated density of between 12.35 and 17.30 dwelling units per hectare.

Other land uses specified in the Area Structure Plan include a centrally located north south linear park and trail feature. The road network shows an internal collector roadway through the area with a collector link to 40th Avenue. There is also a future connection shown to the north Neighborhood Area Structure Plan area.

The East Hill Area Structure Plan is implemented by means of Neighbourhood Area Structure Plans for each quarter section. Other City of Red Deer documents, such as the Neighborhood Planning Guidelines and Standards, the Community Services Master Plan, Ecological Profiles, and Land Use Bylaw, govern the more detailed elements of the planning process.

3.0 SITE CHARACTERISTICS

3.1 Legal Description and Ownership

The subject site is legally described as SE ¼ Section 4, Township 38, Range 27, West of the 4th Meridian. As of December 2006, the registered owners are:

- Melcor Developments Ltd.
- Dr. Alfred and Mary Ordman
- Living Stones Church of Red Deer
- Susan Townsend
- AltaLink Management Ltd.

3.2 Site Area

The gross site area is 61.985 hectares (153.17 acres), of which approximately 7.982 hectares (19.72 acres) are required for the environmental reserve along Piper Creek, 3.733 hectares (9.22 acres) is the AltaLink R.O.W., 3.334 hectares (8.25 acres) is the current church site, and 0.565 hectares (1.40 acres) has been used for the 40th Avenue and 19th Street widening.

3.3 Existing Land Use

The entire developable area has been under cultivation. It is presently designated A-1 Future Urban Development District by the City of Red Deer Land Use Bylaw No. 3157/2006. The general purpose of this District is:

“to allow agricultural and related uses until such time as the land is required for urban development.”

A re-designation to appropriate urban land use districts is therefore required before any urban development can occur.

3.334 hectares in the south east corner of the quarter section is zoned PS Public Service, and has been developed. This is the current location of the Living Stones Church.

3.4 Land Form

The entire area is relatively flat with the exception of the Piper Creek Channel, with the elevation ranging from a high point of 889 metres in the central area of the quarter to a low point of 879 metres in the extreme northwest corner (see Figure 2). An airphoto is shown in Figure 2A.

The Piper Creek channel travels from south to north along the west side of the quarter section. The channel and surrounding area contain trees and vegetation. As this channel and area will become an environmental reserve, and the responsibility of the City of Red Deer, most of the vegetation will remain after development.

3.5 Access

Two present accesses to the quarter are from 40th Avenue, by means of a temporary church access road, and the AltaLink Right of Way.

3.6 Servicing

The site can be completely serviced with sanitary sewer, water and storm water utilities (assuming storm water management techniques are implemented) and shallow utilities from existing infrastructure are located immediately to the east and west.

3.7 Environmental Considerations

A Phase 1 Environmental Site Assessment was completed in the summer of 2006. It states the closed landfill directly to the south of the quarter section is the most significant issue for this development. Due to this, of the land remaining for development the subject land has been subdivided into two lots. The north lot (Lot 1) where residential development is proposed, is set back 300 m (see Figure 2) as required by the *Subdivision and Development Regulation 43/2002*. The south lot (Lot 2), will be zoned commercial, and have restrictions placed on it.

The most current information from the City of Red Deer's ongoing monitoring of the site indicates that there is no current risk due to methane, and that there is potential that leachate may contaminate local ground water. Ground water in the area is moving to the northwest, however, any contamination of the ground water is expected to be minor due to the distance between the closed landfill and the subject area.

Any change in the existing conditions of the closed landfill would be indicated by the City of Red Deer's ongoing monitoring program.

4.0 DEVELOPMENT PROPOSAL

Based on the developer's vision, city policies and site characteristics, a Neighbourhood Area Structure Plan has been prepared for the subject site. The components of the Neighbourhood Area Structure Plan are development concept, land use, density, population, open space, transportation, servicing and phasing.

4.1 Development Concept

The intent of the design concept for the area is to provide a comprehensively planned residential community with an emphasis on integrating land uses and addressing the market factors presently prevalent in the city. The overall concept is generally conventional in nature, in that it:

- Establishes a hierarchy of road patterns (arterial, collector and residential),
- Has a curvilinear road pattern consisting of crescents, and cul-de-sacs, and
- Has densities that are similar to other newer areas in the city.

However, two key aspects of the Plan are not conventional. These include:

- A linear collector road to allow for a view of the Piper Creek Environmental Reserve from 40th Avenue.
- A traffic roundabout located at the intersection of the two collector roads.

Both of the above key aspects are addressed in this report.

The proposed Neighbourhood Area Structure Plan incorporates the policies contained in the East Hill Major Area Structure Plan and other City of Red Deer guidelines and policy documents. As required a noise study may need to be completed; likely at the development stage for residential development backing onto 40th Avenue.

The Plan, based to a large extent on the cluster concept, is intended to provide the opportunity for flexibility and variety of residential product type. This is especially important when considering the dynamics and sensitivity of the present day market.

The proposed Land Use Concept is illustrated in Figure 3. The layout of the development is to take advantage of Piper Creek. A linear collector road allows for a view of the creek valley when entering the area from 40th Avenue.

4.1.1 Land Use Distribution

The Neighborhood Area Structure Plan provides for a comprehensively planned residential community comprised of residential and ancillary uses. Table 1 outlines the land use distribution for the Neighbourhood Area Structure Plan.

Table 1. Neighbourhood Area Structure Plan Statistics

Land Use Category/Component	Area	% of Net Developable Area	Number of Dwelling Units
	(ha)		(du)
Gross Plan Area minus	61.985		
Net Developable Area is made up as follows			
Gross Plan Area Minus			
Environmental Reserve	7.982		
Major Roads (arterial and expressway)	0.565		
Commercial Sites	12.249		
Industrial Uses	0		
Special land use sites as determined by the City (AltaLink R.O.W.)	4.672		
Constructed Wetlands	1.026		
Net Developable Area	35.491	100%	
Total Residential in the base scenario is made up as follows			
Conventional Detached Dwelling (R1)	14.757	41.6%	315
Detached Dwelling with Secondary Suites (SS)	0.269	0.8%	9
Narrow Lot Detached Dwelling (R1N)	0	0.0%	0
Semi-Detached Dwelling (R1A)	1.356	3.8%	38
Multi Family Dwelling Units (R2/R3)	2.994	8.4%	180
Total Residential in the base scenario	19.376	54.6%	542
Social Health			
TDA	0.120	0.3%	
Places of Worship Site	3.334	9.4%	
Open Spaces			
Municipal Reserve (MR)	3.760	10.6%	
Public Utility Lot (PUL)	2.144	6.0%	
Environmental Reserve (ER)	7.982	22.0%	
Transportation			
Collector Roadways	2.090	5.9%	
Local Roadways	3.439	9.69%	
Lanes	1.389	3.91%	

Table 1 illustrates 54.6 percent is for residential uses, 16.6 percent for parks and open space, 22.0 percent for Environmental Reserve and 19.5 percent for streets and lanes of the net developable area. The balance of the area is for other neighborhood uses including a church.

Table 2 shows the same land use information as it applies to lands owned by Melcor Developments Ltd, as shown on Figure 2. This area has been broken out because this NASP submission has been prepared to deal with Melcor Developments Ltd. proposed development. Areas outside of these lands have primarily been shadow planned.

Table 2. Neighbourhood Area Structure Plan Statistics (Melcor Lands)

Land Use Category/Component	Area	% of Net Developable Area	Number of Dwelling Units
	(ha)		(du)
Gross Plan Area minus	36.062		
Net Developable Area is made up as follows			
Gross Plan Area Minus			
Environmental Reserve	4.770		
Major Roads (arterial and expressway)	0.326		
Commercial Sites	0		
Industrial Uses	0		
Special land use sites as determined by The City	0		
Constructed Wetlands	1.027		
Net Developable Area	29.939	100%	
Total Residential in the base scenario is made up as follows			
Conventional Detached Dwelling (R1)	14.757	49.3%	315
Detached Dwelling with Secondary Suites (SS)	0.264	0.9%	9
Narrow Lot Detached Dwelling (R1N)	0	0.0%	0
Semi-Detached Dwelling (R1A)	1.356	4.5%	38
Multi Family Dwelling Units (R2/R3)	2.994	10.0%	180
Total Residential in the base scenario	19.371		542
Social Health			
TDA	0.120	0.4%	
Places of Worship Site	0	0.0%	
Open Spaces			
Municipal Reserve (MR)	3.266	10.5%	
Public Utility Lot (PUL)	0.363	1.2%	
Environmental Reserve (ER)	4.770	15.9%	
Transportation			
Collector Roadways	2.090	7.0%	
Local Roadways	3.439	11.5%	
Lanes	1.389	4.6%	

4.1.2 Residential

The plan is a carefully integrated neighbourhood, providing for a variety of housing types, ranging from single detached to apartments. It is comprised of a series of residential cells relating to the collector street loop and focusing to a large extent upon small parks and the linear open space network.

The residential medium density areas are proposed in two locations,

- One site, likely comprised of an apartment style R3 condominiums, in the west, and
- One R2 site in the east portion will likely be townhouses.

Areas proposed for two-storey homes with walkout basements are shown in Figure 3. The areas proposed for two-storey walkout basements shown in Figure 3 are based on preliminary grading design. The walkout locations may vary over time as more detailed design information becomes available, and may require an amendment to this plan.

Potential residential development located north of the Living Stones Church would only be possible with approval from Alberta Environment, see section 4.1.5 for additional information.

4.1.3 Temporary Care/Day Care/Assisted Living Facility/Church Site

A 0.12 ha TDA site has been provided. The location is central within the residential development. As the site is located on a collector road the site will have easy access. If a facility on the site is not constructed the area will convert to residential R1 zoning in accordance with the procedural requirements of the Neighborhood Planning Guidelines and Standards.

As the Living Stones Church is currently located in the quarter section, no additional lands have been provided for in this document.

4.1.4 Density

The residential density identified in the East Hill Major Area Structure Plan is in the range of 12.35 to 17.30 dwelling units per developable hectare. Table 3 shows a break down of the estimated densities within Sunnybrook South.

Table 3: Estimated Density

Density	Dwelling Units (du)	Area (ha)	Density (du/ha)
Scenario 1 (with TDA)	542	29.939	18.10
Scenario 2 (TDA converted to R1)	544	29.939	18.17
Housing Mix - Based on Scenario 1	Dwelling Units (du)	% of Total Residential Land Area	% of Total Number of Lots
Conventional Detached Dwellings (R1)	315	75.0%	58.1%
Detached Dwelling With Secondary Suites (SS) 6x1.5	9	1.4%	1.7%
Narrow Lot Detached Dwelling (R1N)	0	0.0%	0.0%
Semi-Detached Dwellings (R1A)	38	6.9%	7.0%
Multi Family Dwelling Units (R2/R3)	180	17.0%	33.2%
Total Residential in base scenario	542	100.0%	
Ratio detached dwellings to semi-detached dwelling units	8.4:1		
Lots for detached dwelling units with secondary suites as a % of total number of R1 lots	1.9%		

The Neighborhood Area Structure Plan, depending upon the actual lot size and ultimate multi-family product, is anticipated to accommodate about 542 dwelling units.

Based upon the estimated product distribution this equates to a density of approximately 18.1 dwelling units per net developable hectare.

4.1.5 Commercial

For the purpose of this Neighborhood Area Structure Plan the commercial lands have been shadow planned only. Development of the commercial area may require an amendment to this plan to provide more detail.

As shown in Figure 2 the majority of the commercial area is situated within 300 metres of the former landfill site. Subdivision and development of the commercial area must comply with the provisions of section 13 of the *Subdivision and Development Regulation, AR 43/2002*, regarding separation distances from a non-operational landfill.

Figure 5 of the East Hill Major Area Structure Plan (EHMASP) acknowledges this situation by noting that commercial development will be restricted, and it states that there will be no subdivision for or development of a school, hospital, food establishment, or residential use. Section 4.2.4 of the EHMASP states that the uses in this area will be similar to C4 Commercial (Major Arterial) District, but with the restrictions imposed by the *Subdivision and Development Regulation*. Further, the EHMASP adds that this area will be redistricted to either a Direct Control District or a special commercial district.

It is therefore anticipated that the commercial area will be provided for C4 Commercial (Major Arterial) District and / or C2A Commercial (Regional Shopping Centre) District type uses in either a direct control district or a special commercial district.

The type of separation / buffering provided between residential and non-residential land uses shall be as per City requirements (i.e. the Neighborhood Planning Guidelines & Standards) contingent upon the type and intensity of the non-residential development.

4.1.6 Open Space

The key components of the open space system proposed in the Neighbourhood Area Structure Plan are discussed below, followed by a statement of municipal reserve calculations. An open spaces plan can be seen in Figure 4.

Components

The components of the proposed open space system, which are cited below, include Piper Creek, storm detention facilities, and a centrally located linear park.

- a) **Park**
A 1.055 hectare park provides a central open space feature and pedestrian connection. The Plan also includes a children's playground and a north/south linear park. Local gathering places indicated on the plan are located within green space with trail and transit elements nearby.
- b) **Storm Detention**
Two storm detention facilities are provided in the Plan. One is situated in the northeast corner of the site and is to be developed as a wetland. The second facility is proposed in the south half of the Plan area, within the area not owned by Melcor Developments Ltd. The location shown for this storm pond is based on the location proposed in the East Hill Major Area Structure Plan.
- c) **Piper Creek**
A 7.982 ha Environmental Reserve located along Piper Creek will allow

for additional green space.

Municipal Reserve

In order to realize the open space network envisioned by the Plan, there is a total of 3.760 hectares of municipal reserve. This accounts for 10.6 percent of the net developable area. As can be seen in Table 2, the M.R. dedication for the residential area is 10.8%. The north portion of the plan which contains the residential development is providing an over dedication of municipal reserve land. Dedication for the commercial may take the form of money in lieu, for M.R. outside of the requirements along Piper Creek. If the church site is further subdivided M.R. dedication may be owed on the church site.

5.0 TRANSPORTATION

5.1 Traffic Circulation Pattern

The traffic circulation pattern proposed in the Neighbourhood Area Structure Plan conforms to the East Hill Major Area Structure Plan. At some point in the future, there will be three arterial roadways adjacent to the quarter section:

- 22nd Street along the northern boundary of the quarter, and
- 19th Street along the southern boundary of the quarter, and
- 40th Avenue along the eastern boundary of the quarter section.

The internal transportation system will tie into 40th Avenue to the east, and a collector stub will be provided at the north which will tie the internal collector to the future development to the north, for the residential area east of Piper Creek. This may ultimately connect to Molly Banister Drive. The residential area to the west of Piper Creek will tie into Barrett Drive at the Barrett Drive / Bettenson Street intersection. The particulars of the Barrett Drive cul-de-sac entry road will be determined to the satisfaction of the City at the subdivision and development stage.

Two connections will allow access to the commercial development via 19th Street. The locations of these future connections are shown for illustrations purposes, and may be relocated in the future depending on the developments requirements. No direct link between the commercial development in the south area and the residential area is planned. It is proposed that transit may service this quarter from the bordering arterial roadways, as all lots are within a 400 metre radius of the bordering roadways.

It is anticipated that, pending budget approval, The City will conduct a traffic and pedestrian warrant study in 2008. This study will include the Ironside Street and 40th Avenue intersection. The signal warrant analysis results will then determine the priority for when signals should be installed.

An auxiliary lane will be provided to accommodate accesses to the commercial and church sites along 19th Street. An all turns access may be acceptable on 19th Street west of 40th Avenue (subject to a Traffic Impact Assessment and Engineering Services Review). Any other access would be right-in / right-out only. The developer of the commercial lands will be responsible for the arterial roadway improvements. Two approaches have been shown on the figures, these are preliminary locations; detailed design would be based on the Traffic Impact Assessment. In order to minimize potential conflicts between residential and non-residential areas no access to or from non-residential areas will be provided by the lanes adjoining residential areas.

Access to the church site will be accommodated via a roadway through the multi family site. Potentially the roadway may be accommodated within an easement. The roadway access will be reviewed by Engineering Services upon development of Phase 2, and may provide for an alternative alignment or location. As the commercial area

develops, access to the church site will become available through the commercial site by a means of a joint access agreement or other means acceptable to the City. When an alternate access to the church site is provided through the commercial area, the City, having completed a public consultation process, may remove the north public roadway access to Living Stones Church. If the roadway is removed, the land will be returned as part of the multi family site. Closure of the 40 Avenue (north) access may provide the possibility for the Church to develop a right-in / right-out access along 40 Avenue at / near the northeast corner of the church site. Design and exact location of all access points will be to the satisfaction of the City.

Figure 5 also illustrates the proposed cross-sections for the internal collector loop road.

Residential entrance roads, many of which have medians, will provide access to each of the cells. A temporary turnaround will be provided at the north end of the collector stub as per the requirements of The City.

5.1.1 Linear Collector Road and Roundabout

The roundabout located at the intersection of the collector roads allow for a smooth flow of traffic through the subdivision, and will provide for a feature landscaped area. The roundabout will be designed to allow for the continuous movements of traffic in a very safe and efficient manner. The roundabout will be single lane and will allow for vehicle, such as transit buses, garbage trucks, and emergency services, to easily navigate the intersection without having to mount the curb. Larger units, such as moving trucks and construction traffic, will be able to navigate the roundabout by using the semi-mountable concrete apron in the middle of the intersection. Figure 6 shows a proposed concept plan.

5.1.2 Molly Banister Drive Alignment

Figure 7 shows the possible Molly Banister Drive Alignment, a possible future connection for the north south collector road.

It should be noted that the question of whether Molly Banister Drive extension across Piper Creek is still under review. If Molly Banister Drive is extended across Piper Creek, any final alignment will be determined at the time of the NASP preparation for the quarter section north of Sunnybrook South.

5.1.3 Jug Handle Road

One possible use of the narrow strip of land north of the church site is a proposed roadway used to connect 40th Avenue and 19th Street. Figure 3 shows the approximate alignment. The status of the potential road will be confirmed prior to development of the commercial site.

5.2 Pedestrian Circulation Patterns

Figure 4 illustrates a continuous integrated pedestrian system throughout the quarter section. As shown on the Plan:

- The pedestrian linkage is continued from the Bower and Inglewood subdivisions via the 2.5 metre wide paved walkway located along the north side of the AltaLink R.O.W..
- Pedestrian linkage is provided to 40th Avenue at 22nd Street.
- A pedestrian linkage has been provided for through the central linear and neighborhood park system.
- Internal linkages exist to the centrally located linear park system.

The pedestrian linkage system illustrated in Figure 4 connects key neighbourhood elements and will enable residents to walk, run or ride bicycles through the community on a system of paths in open spaces or on boulevard walks that are separate from the roadways. Proposed transit stops are located to provide transit service within 400 m of all lots. The proposed crossing of Piper Creek is shown as it appears in the Trails Master Plan, approved by City Council in 2005.

Pathways shown in the commercial part of the development are the responsibility of the future developer. The pedestrian movement patterns are designed for both internal and external flows.

6.0 MUNICIPAL SERVICING

For the area east of Piper Creek most of the municipal services required to service this quarter section are direct extensions of services located along the east boundary of the quarter section. For areas west of Piper Creek sanitary and water servicing is extended from the Bower quarter and storm water will be discharged into Piper Creek.

6.1 Storm Sewer System

Due to the topography of the site, two storm detention ponds will be required to service the quarter section. The first is located in the north east corner of the quarter section and is partially within the AltaLink right of way. This pond will service a large area of the residential lands. The pond will outlet into an existing storm trunk located north of the AltaLink right of way. The west part of the development will detain water in trap lows and pass the runoff through a storm water treatment unit prior to discharging to Piper Creek.

A second storm detention pond is required to service the commercial area of the quarter section. This pond is proposed to outlet into the Piper Creek Tributary located adjacent to the pond.

6.1.1 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 catchbasins and catchbasin manholes to collect runoff and route the runoff to a storm water management facility and then to Piper Creek. 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.

Figure 8 illustrates the conceptual layout for the storm servicing.

6.1.2 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 either the northeast or south storm detention ponds. 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 Figure 9. Interception of drainage from lots backing onto Piper Creek will be provided.

The north storm water pond will contain manmade wetlands in the areas outside of the AltaLink Right of Way. Figure 10 shows the wetlands concept plan. This will provide enhanced quality to the runoff prior to being discharged into Piper Creek. It can not be overemphasized that this is required to safeguard the existing drainage route to the river from a water conveyance, water retention and ecological integrity perspective. Equally important is the implementation (i.e., construction phase) of well planned storm water management strategies to safeguard the sustainability of natural habitats.

6.2 Sanitary Sewer System

The sanitary sewer system required to service the subject quarter section is a direct extension of the sanitary sewer system located within the Anders on the Lake subdivision to the northeast, and the Bower subdivision to the west.

A 375 millimetre diameter sanitary main will be utilized to service the east part of the subject quarter section. Based on the relatively flat ground elevation, this trunk will be able to service the entire lands east of Piper Creek. Figure 11 illustrates the conceptual layout. Additional links to the south commercial area can be tied into the south alignment of the sanitary line if required. A 200 mm diameter sanitary main, located in the Bower subdivision would be utilized to provide service to Phase 1. Phase 1 is expected to add less than 2.2 L/s peak flow to the existing system, or 10% of the pipes capacity.

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

6.3 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 Inglewood quarter sections to the east, and the Bower quarter section to the west. The largest water supply mains include:

- A 300 millimetre diameter water main located near the east end of the east-west collector road.
- A 400 millimetre diameter water main located along 19 Street will be added when the commercial development occurs.
- A 250 millimetre diameter water main to be tied into for the commercial area located at the Living Stones Church.

- A 300 millimetre stub will be installed at the north collector road to provide a future tie in to the north.
- A 200 millimetre main located on Barrett Drive can be connected to, and looped, for Phase 1.

Computer water modeling will be utilized to evaluate actual water main sizes within the subject quarter section. It is expected that the peak hour demand of Phase 1 will be 2.5 L/s.

Figure 12 illustrates the conceptual layout for water servicing.

6.4 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 quarter sections to the east and west. It is anticipated that extension of these utilities will not be difficult.

7.0 PHASING OF DEVELOPMENT

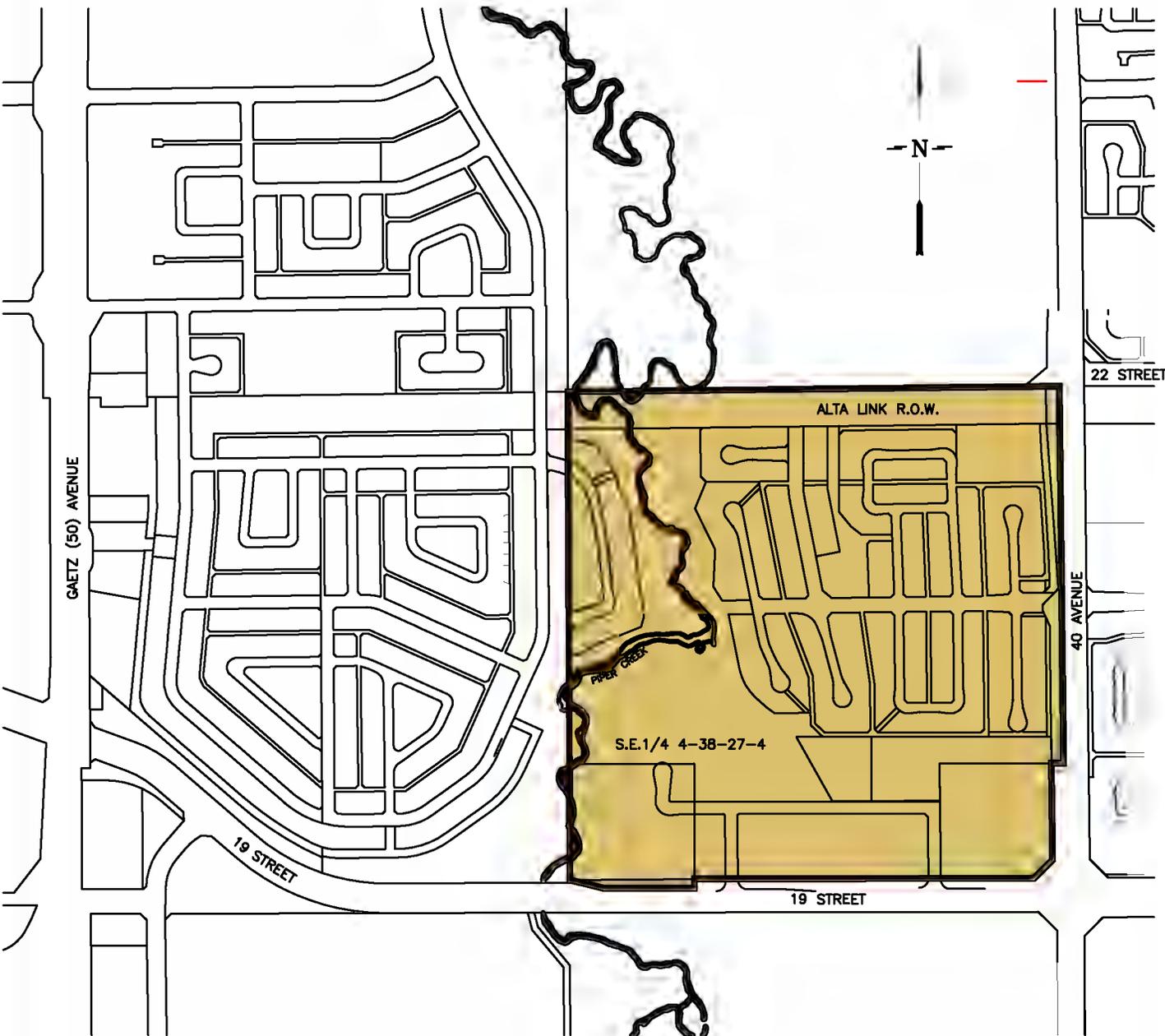
Figure 13 illustrates the proposed phasing for development. The present location of utilities dictates the initial few phases of development. Market conditions will influence the actual phasing of later development. The phasing provides tie-ins to existing city infrastructure at the onset on the development. The services will be extended into each phase as required.

APPENDICES

APPENDIX [A]

Figures

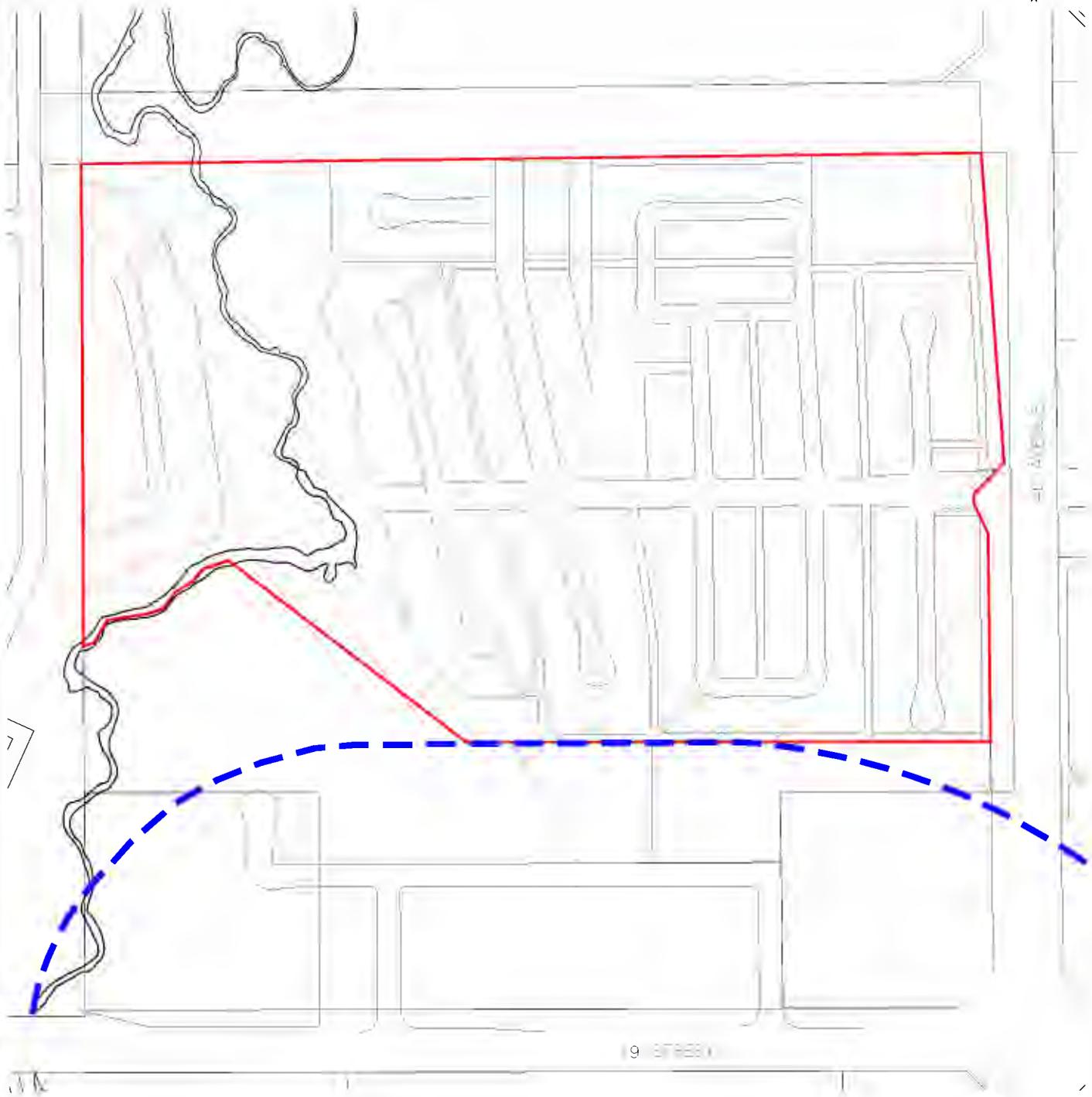
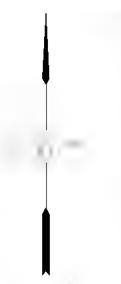
MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



DATE DRAWN: December 4, 2006
DATE REVISED: JUNE 28, 2012
DRAWN BY: WLT
SCALE: 1:10,000
LOCATION: \PROJECTS\262\2012 NASP REVISIONS-JUNE\
FIGURE 1 - LOCATION.dwg

**FIGURE 1
LOCATION**

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN

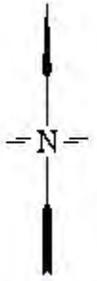


LEGEND:
- - - 300m LANDFILL SETBACK
[Red Outline] MELCOR DEVELOPMENT LTD. LAND

FIGURE 2
EXISTING CONTOURS

DATE: 10/10/2011
DRAWN BY: [illegible]
CHECKED BY: [illegible]

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



DATE DRAWN June 1, 2007
DATE REVISED June 28, 2008
SCALE 1:5000
PROJECT PATH C:\PROJECTS\2062-CROWN\2002 NAGP REVISIONS-JUNE\FIGURE 2a-AIR PHOTO

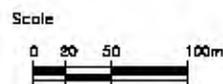
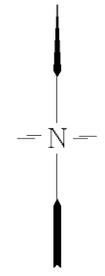
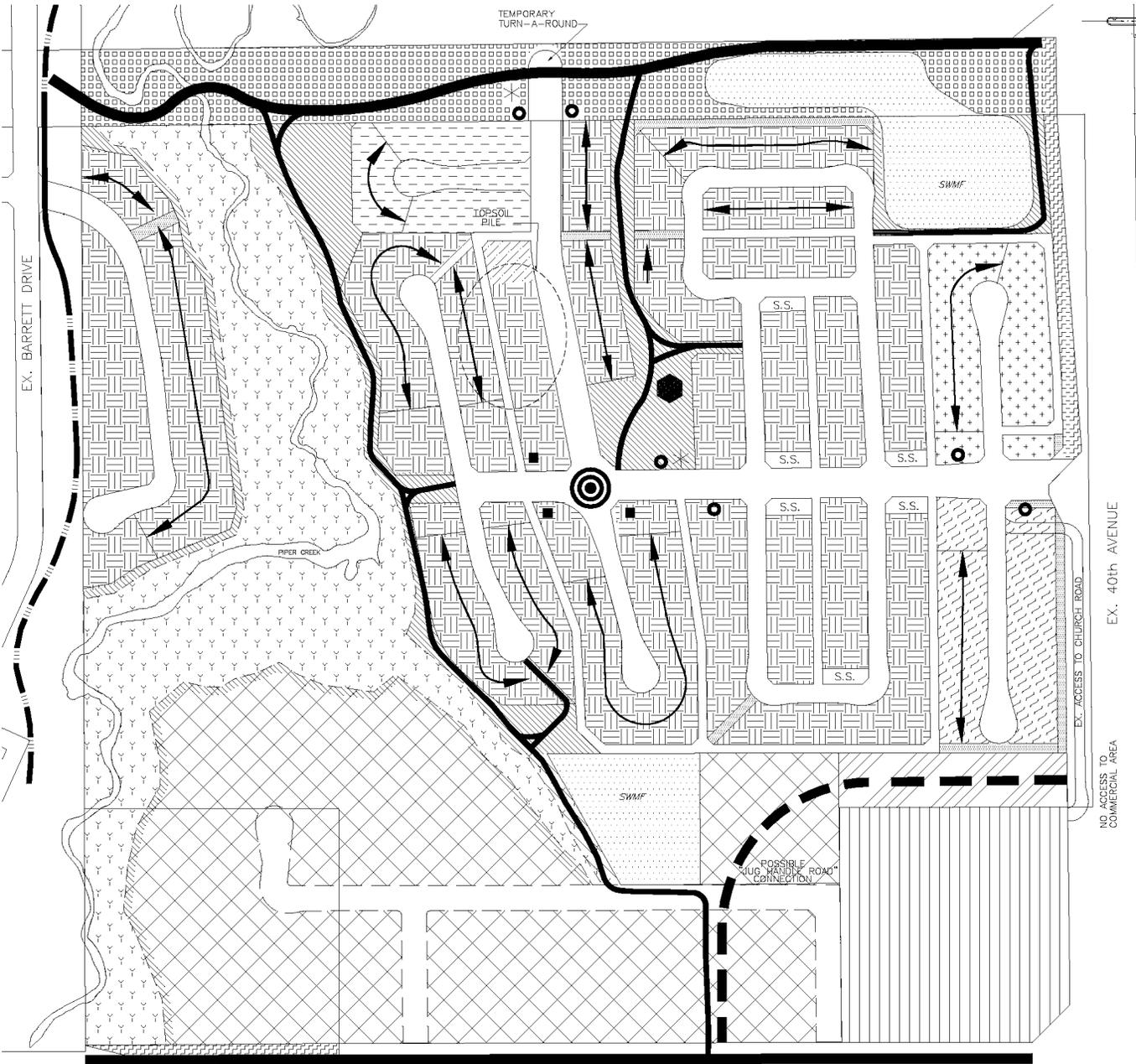


FIGURE 2a
AIR PHOTO

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



LEGEND:

- SINGLE FAMILY DETACHED - R1
- DUPLEX - R1-A
- MULTI-FAMILY - R2
- MULTI-FAMILY - R3
- MUNICIPAL RESERVE (M.R.)
- ENVIRONMENTAL RESERVE
- PUBLIC UTILITY LOTS
- ROADS AND LANES
- COMMERCIAL (C2A OR C4 TYPE)
- COMMERCIAL ROADWAY
- LIVING STONES CHURCH
- DAYCARE
- SECONDARY SUITES
- ALTA LINK R.O.W.
- ROAD RIGHT OF WAY EXTENSION
- TWO STOREY HOMES WITH WALKOUT BASEMENTS
- POSSIBLE COMMERCIAL, RESIDENTIAL OR PUBLIC USE
- ROUNDABOUT
- CHILDREN'S PLAYGROUND
- GATHERING PLACE
- BUS STOP
- REAR ACCESS ONLY
- 2.5m PATHWAY
- 3.0m PATHWAY
- EX. PATHWAY

FIGURE 3 LAND USE CONCEPT

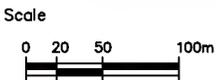
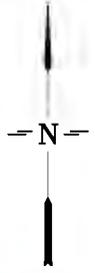


S.E. 1/4 SEC. 4, TWP. 38, RGE. 27, W4thM.

EX. 19th STREET

DATE DRAWN: November 21, 2007
 DATE REVISED: June 28, 2012
 DRAWN BY: WLT
 SCALE: 1:5000
 LOCATION: \PROJECTS\262\2012 NASP REVISIONS-JUNE\
 FIGURE 3 - LAND USE-block&white.dwg

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



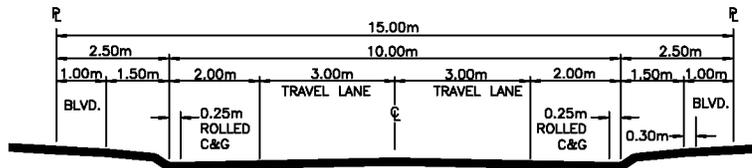
LEGEND:

P.U.L.		ALTA LINK R.O.W.	
MUNICIPAL RESERVE		2.5m PATHWAY	
ENVIRONMENTAL RESERVE		3.0m PATHWAY	
ROAD R.O.W.		Ex. PATHWAY	

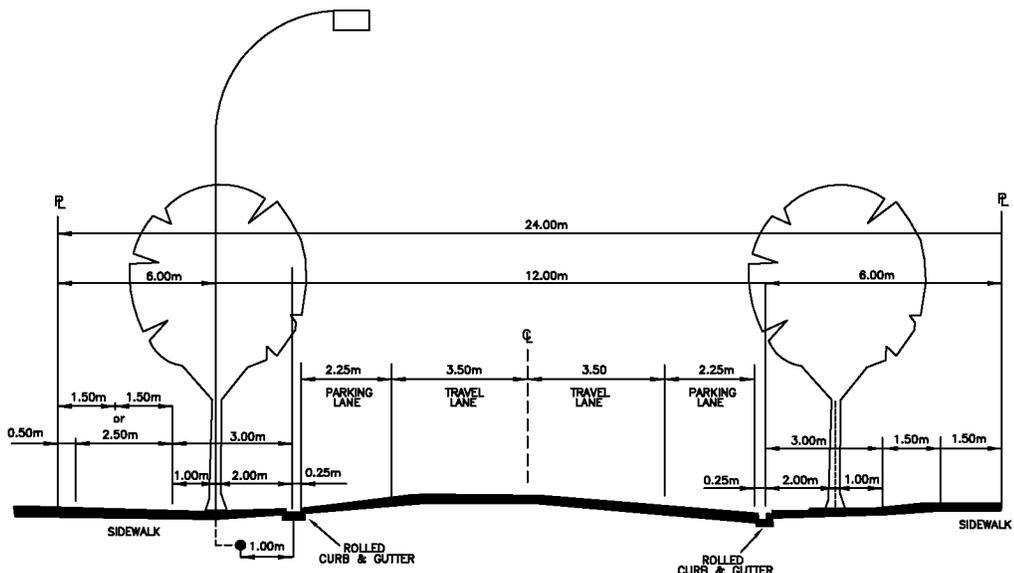
DATE DRAWN: December 4, 2006
 DATE REVISED: June 28, 2012
 DRAWN BY: WLT
 SCALE: 1:5,000
 LOCATION: \PROJECTS\262\2012 NASP REVISIONS-JUNE\
 FIGURE 4 - OPEN SPACES.dwg

**FIGURE 4
OPEN SPACES
PLAN**

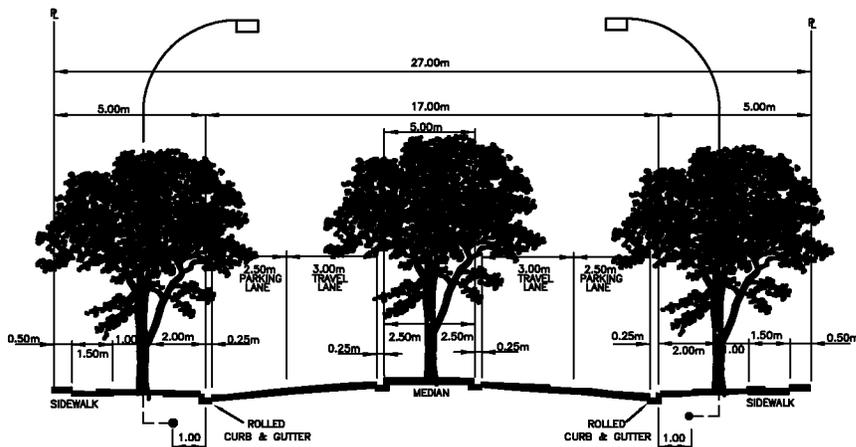
MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



MINOR RESIDENTIAL 15/10



COLLECTOR ROADWAY 24/12

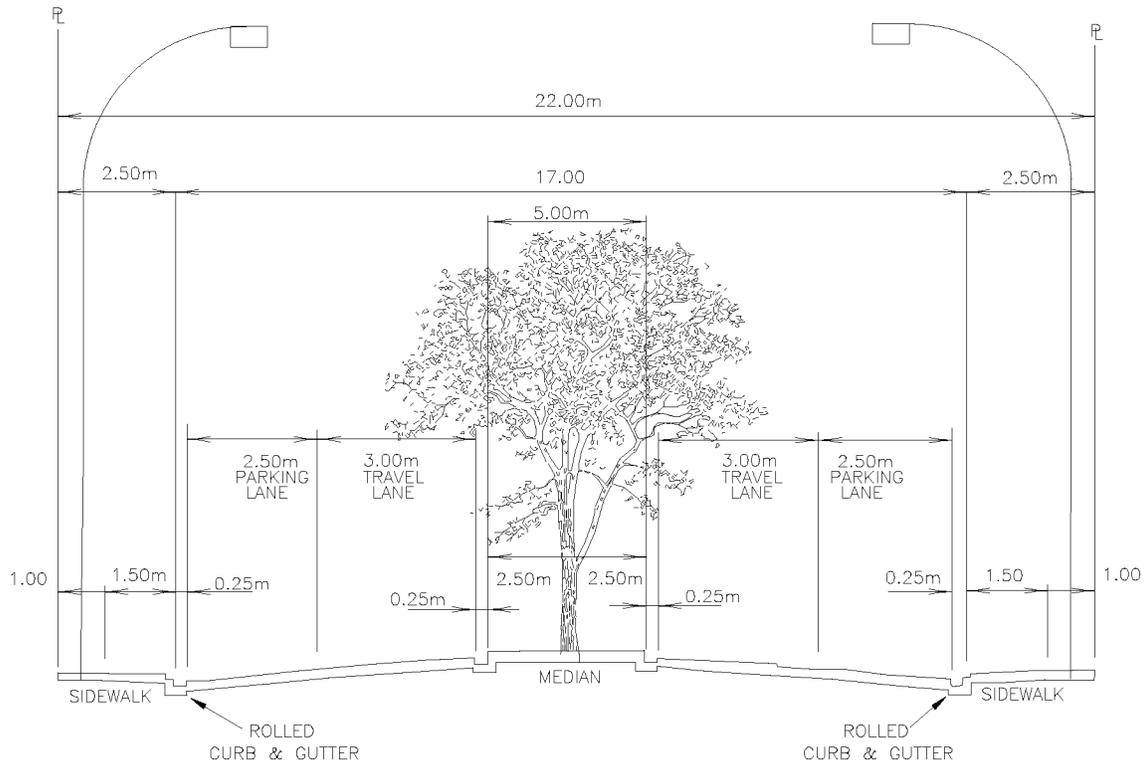


DIVIDED COLLECTOR ROADWAY
WITH TREES IN 5.0m MEDIAN AND TREES IN BOULEVARD

DATE DRAWN: DECEMBER 13, 2006
DRAWN BY: DTN
SCALE: N.T.S.
LOCATION: \PROJS\262\2007NASP\
FIGURE 5 ROAD CROSS SECTION.dwg

**FIGURE 5
ROAD DETAIL**

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



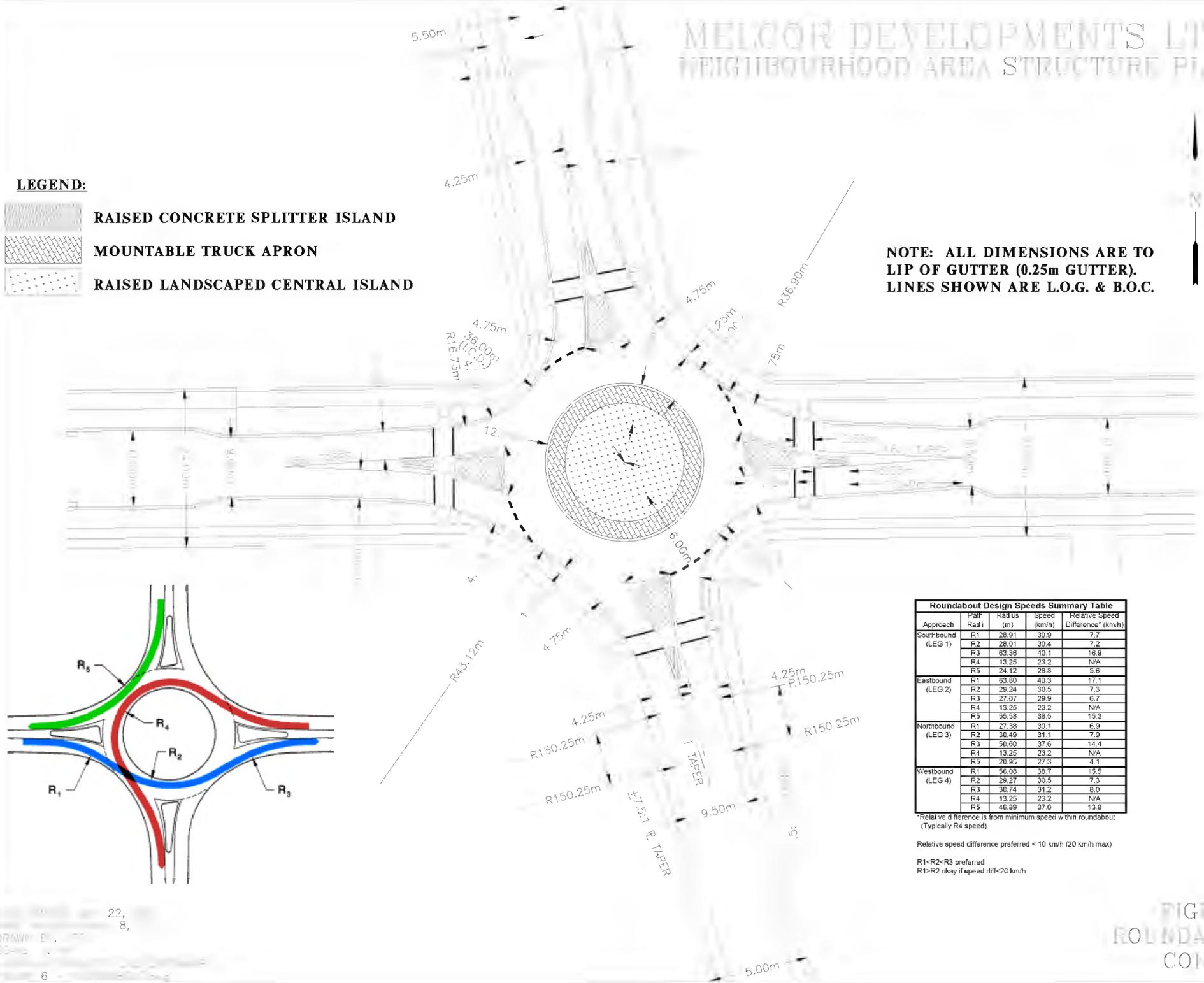
DIVIDED LOCAL ROADWAY
WITH TREES IN 5.0m MEDIAN AND TREES IN BOULEVARD

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN

LEGEND:

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

**NOTE: ALL DIMENSIONS ARE TO LIP OF GUTTER (0.25m GUTTER).
LINES SHOWN ARE L.O.G. & B.O.C.**



Roundabout Design Speeds Summary Table				
Approach	Path Rad1	Radius (m)	Speed (km/h)	Relative Speed Difference* (km/h)
Southbound (LEG 1)	R1	28.91	30.9	7.7
	R2	28.01	30.4	7.2
	R3	63.98	40.1	16.9
	R4	13.25	23.2	N/A
	R5	24.12	28.8	5.6
Eastbound (LEG 2)	R1	63.80	40.3	17.1
	R2	29.24	30.5	7.3
	R3	27.07	29.9	6.7
	R4	13.25	23.2	N/A
	R5	55.58	38.5	15.3
Northbound (LEG 3)	R1	27.38	30.1	6.9
	R2	30.49	31.1	7.9
	R3	50.60	37.6	14.4
	R4	13.25	23.2	N/A
	R5	20.95	27.3	4.1
Westbound (LEG 4)	R1	56.08	38.7	15.5
	R2	29.27	30.5	7.3
	R3	30.74	31.2	8.0
	R4	13.25	23.2	N/A
	R5	46.89	37.0	13.8

*Relative difference is from minimum speed within roundabout (Typically R4 speed)

Relative speed difference preferred < 10 km/h (20 km/h max)

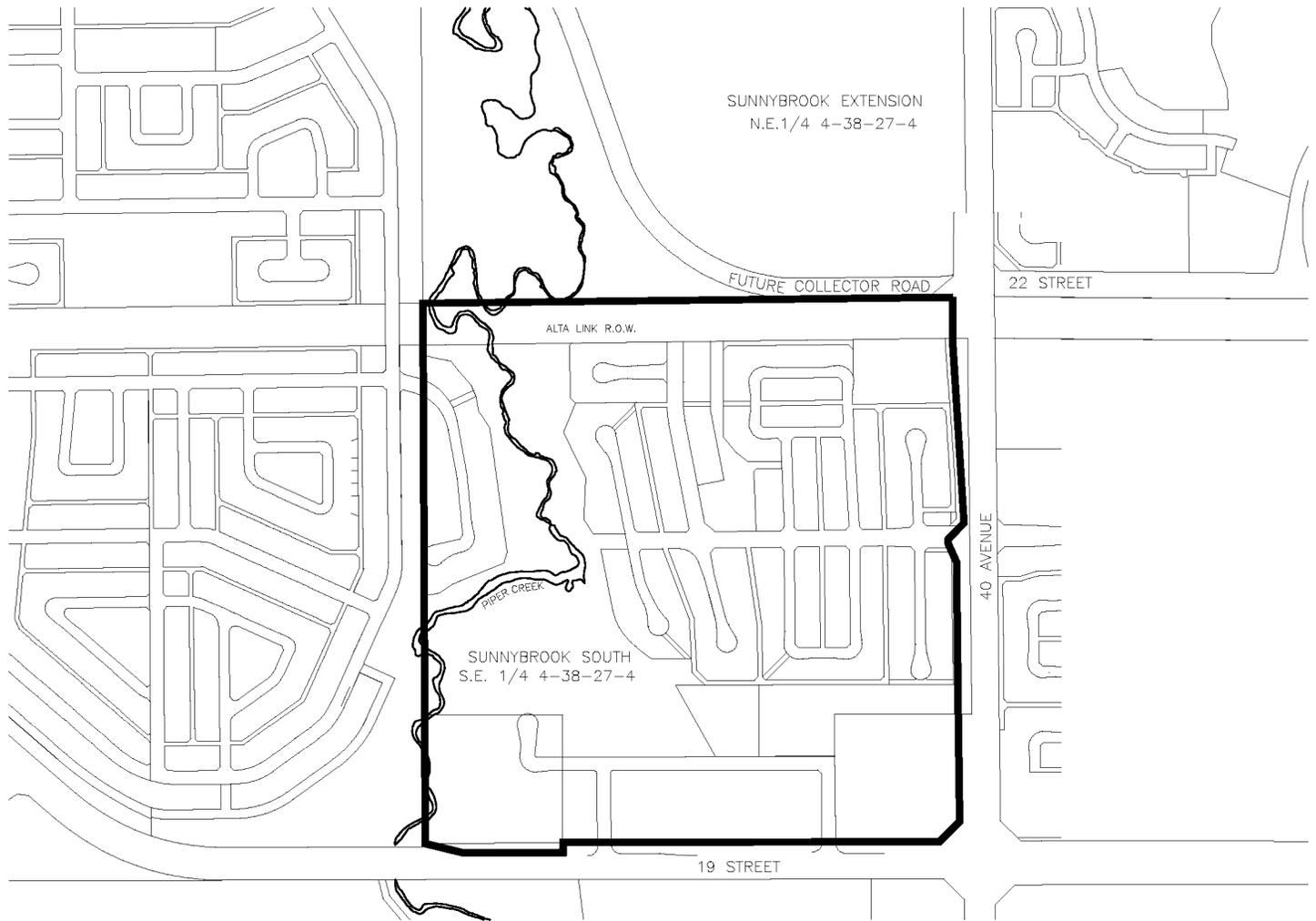
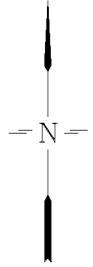
R1<R2<R3 preferred
R1<R2 okay if speed diff<20 km/h

**FIGURE 6
ROUNDABOUT
CONCEPT**

22,
8,

DRAWN BY
Scale

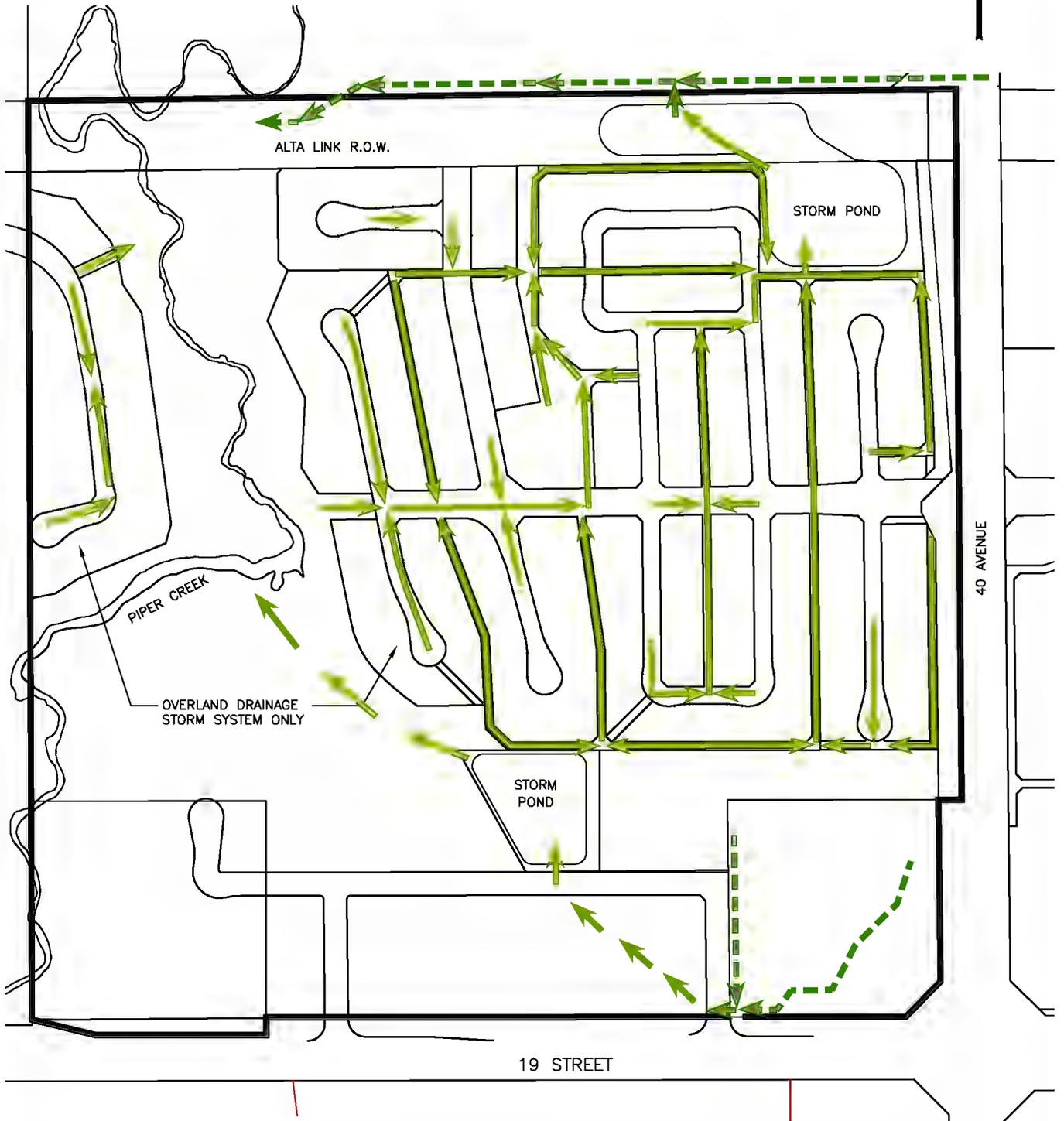
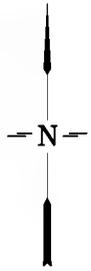
MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



DATE DRAWN: December 4, 2006
DATE REVISED: June 28, 2012
DRAWN BY: WLT
SCALE: 1:10,000
LOCATION: \PROJECTS\262\2012 NASP REVISIONS-JUNE\
FIGURE 7 - MOLLY BANISTER.dwg

**FIGURE 7
PROPOSED NORTH CONNECTOR**

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



DATE DRAWN: December 4, 2006
 DATE REVISED: June 28, 2012
 DRAWN BY: WLT
 SCALE: 1:5,000
 LOCATION: \PROJECTS\262\2012 NASP
 REVISIONS-JUNE\
 FIGURE 8 - MAJOR STORM.dwg

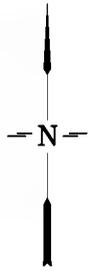


LEGEND:

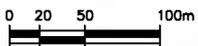
- OUTLINE BOUNDARY**
- STORM SEWER MAIN**
- EXISTING SEWER MAIN**

FIGURE 8
STORM SEWERS

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



Scale



DATE DRAWN: December 4, 2006

DATE REVISED: June 28, 2012

DRAWN BY: WLT

SCALE: 1:5,000

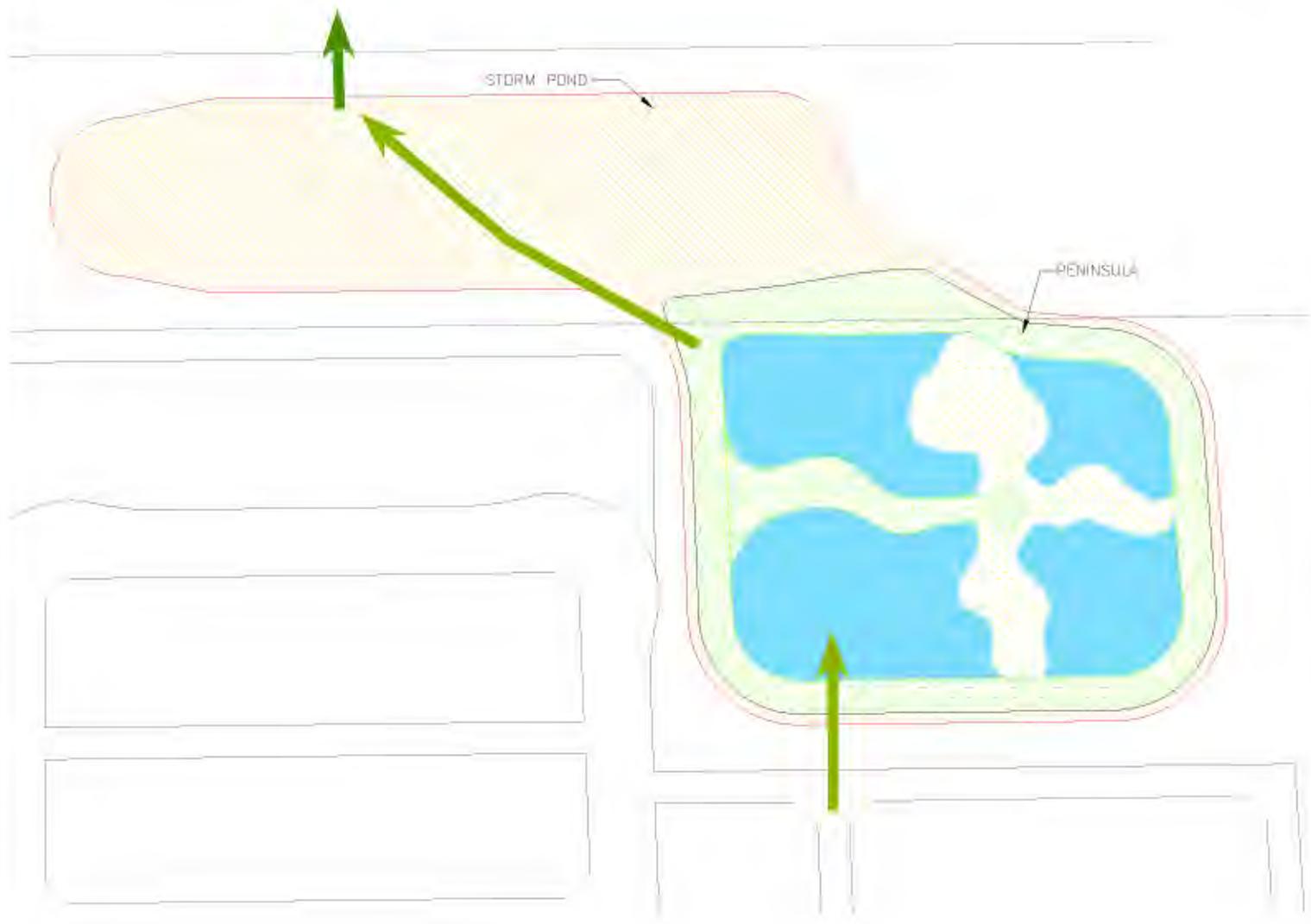
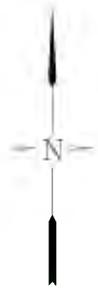
LOCATION: \PROJECTS\262\2012 NASP REVISIONS-JUNE\
FIGURE 9 - OVERLAND DRAINAGE.dwg

LEGEND:

- OUTLINE BOUNDARY**
- MAJOR STORM FLOW DIRECTION**
- 100 YEAR STORM FLOOD LINE**

**FIGURE 9
OVERLAND
DRAINAGE**

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



1:1000

LEGEND:

- UPLAND VEGETATION AREA
- RIPARIAN VEGETATION AREA
- AQUATIC/EMERGENT VEGETATION - SHALLOW POCKET
- DEEP POCKET
- STORM SEWER MAIN
- EFF. SEWER MAIN

**FIGURE 10
WETLAND CONCEPT**

DATE DRAWN: April, 2007
DATE REVISED: August 20, 2007
DRAWN BY: K. Illian
SCALE: 1:1500
LOCATION: \\PROJECTS\262-DROMAN\2007\ASP-
AUG.9\FIGURE 10-WETLAND CONCEPT

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



TIE TO EXISTING
200mm SAN. SEWER
WEST OF BARRETT DRIVE

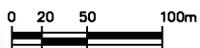
ALTA LINK R.O.W.

PIPER CREEK

40 AVENUE

19 STREET

Scale



LEGEND:

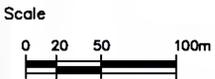
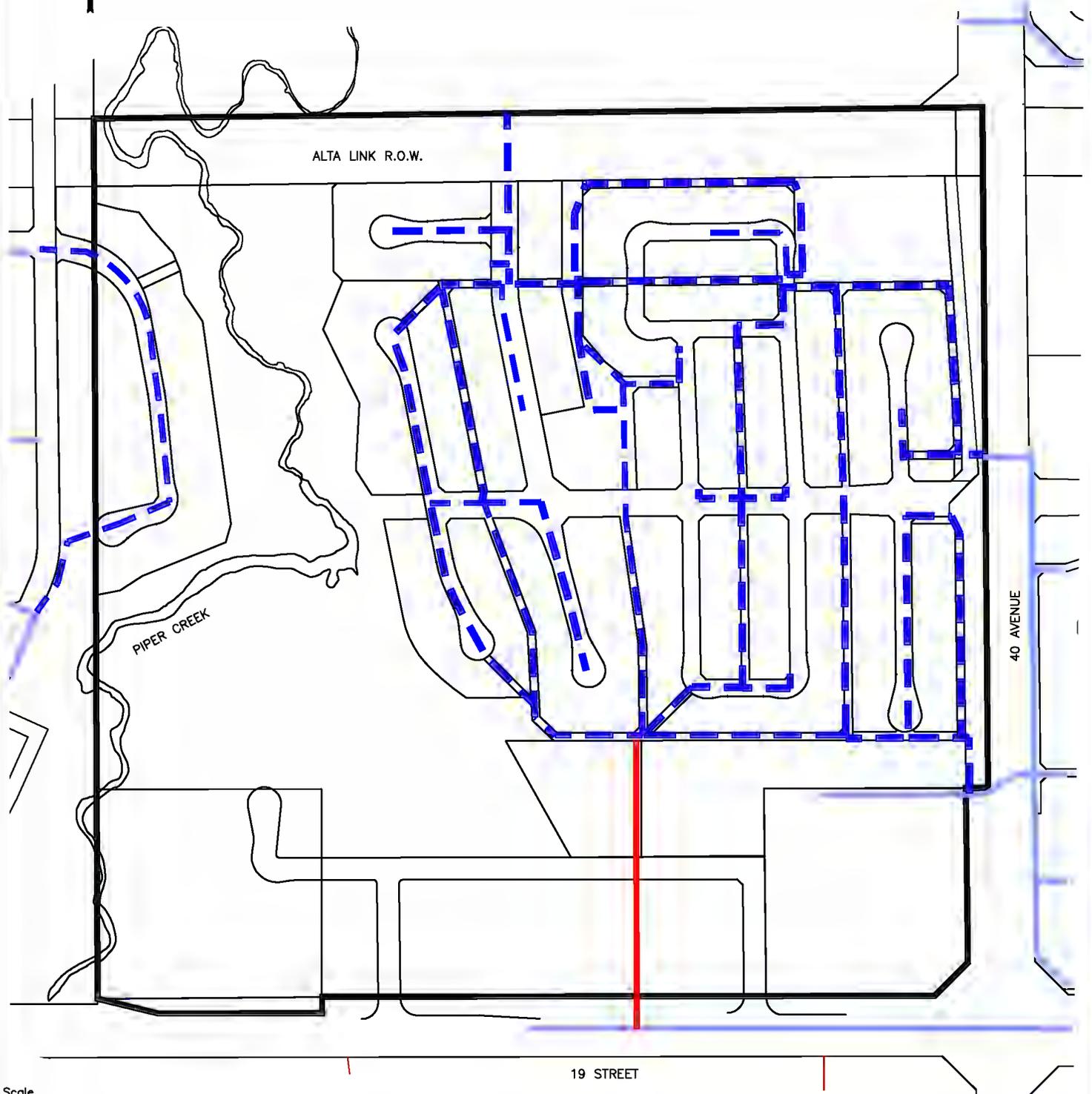
-  **OUTLINE BOUNDARY**
-  **SANITARY SEWER MAIN**
-  **EXISTING SANITARY SEWER MAIN**

**FIGURE 11
SANITARY
SEWERS**

DATE DRAWN: December 4, 2006
DATE REVISED: June 28, 2012

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN

- N -

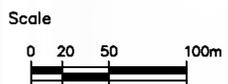
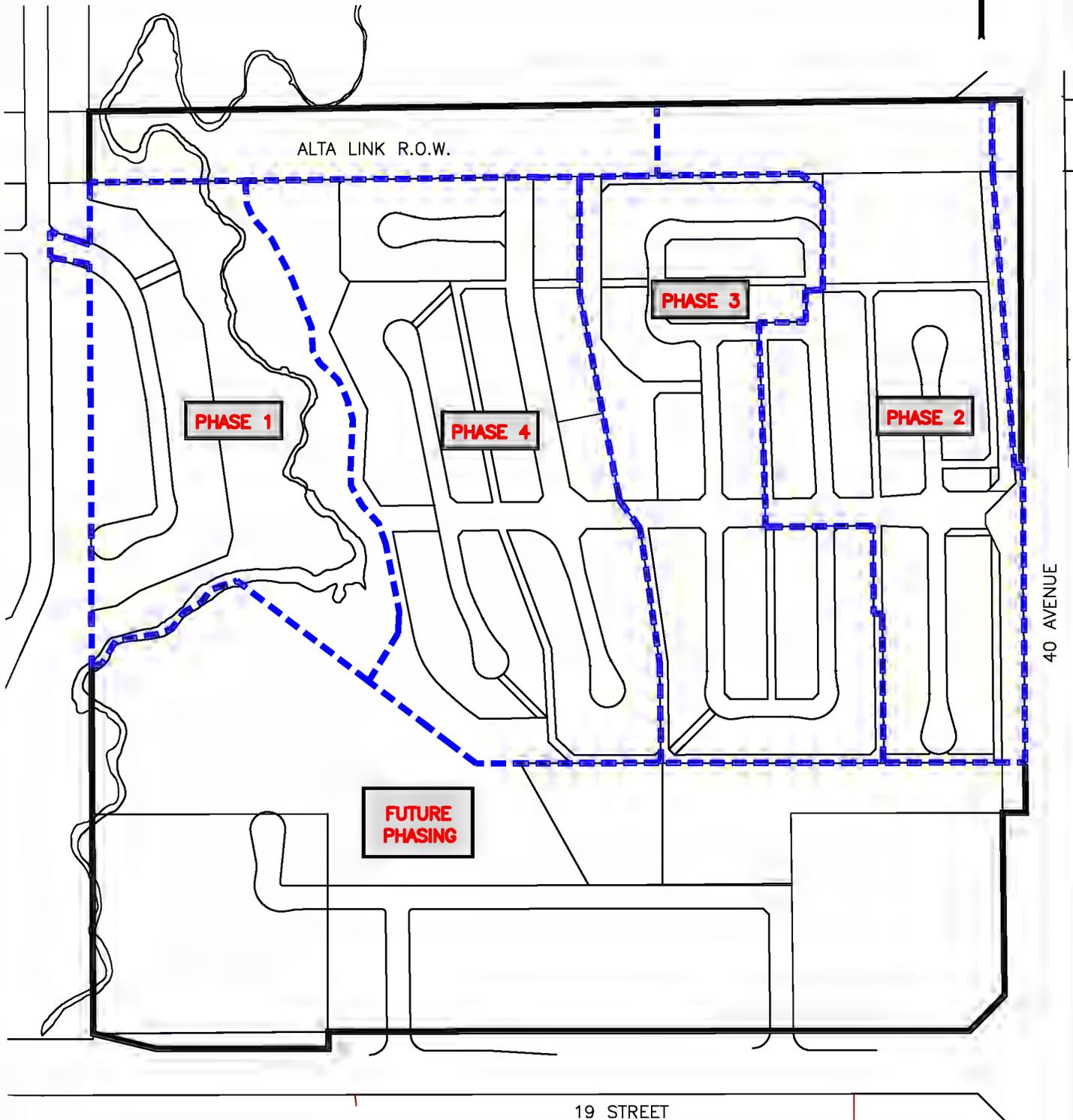
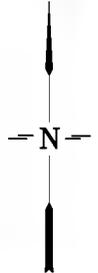


DATE DRAWN: December 4, 2006
DATE REVISED: June 28, 2012
DRAWN BY: WLT
SCALE: 1:5,000
LOCATION: \PROJECTS\262\2010 NASP REVISIONS-JUNE\
FIGURE 12 - WATER DISTRIBUTION.dwg

- LEGEND:**
- OUTLINE BOUNDARY**
 - WATER MAIN**
 - EXISTING WATER MAIN**
 - CONCEPTUAL ALIGNMENT**

FIGURE 12
WATER
DISTRIBUTION

MELCOR DEVELOPMENTS LTD. NEIGHBOURHOOD AREA STRUCTURE PLAN



LEGEND:
——— OUTLINE BOUNDARY
- - - - PHASE BOUNDARY

**FIGURE 13
PHASING CONCEPT**

DATE DRAWN: December 4, 2006
DATE REVISED: June 28, 2012
DRAWN BY: WLT
SCALE: 1:5,000
LOCATION: \PROJECTS\262\2012 NASP REVISIONS-JUNE\
FIGURE 13 - PHASING.dwg