



NEIGHBOURHOOD AREA STRUCTURE PLAN

<u>Developers</u>	<u>Engineers/Consultants</u>
Redbrook Group 2 Corporation	UMA Engineering Ltd.
DMC Construction	Al-Terra Engineering Ltd.

Originally approved as an Outline Plan by City Council
January 1998

Converted to a Neighbourhood Area Structure Plan by City Council
 (Bylaw 3217/98)
December 7, 1998

Neighbourhood Area Structure Plan amended by City Council
 (Bylaw 3217/B-99)
October 12, 1999

Neighbourhood Area Structure Plan amended by City Council
 (Bylaw 3217/A-2001)
March 12, 2001

Neighbourhood Area Structure Plan amended by City Council
 (Bylaw 3217/E-2003)
May 5, 2003

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Appendix 1: Austin Drive Re-alignment

Appendix 2: Encumbrance

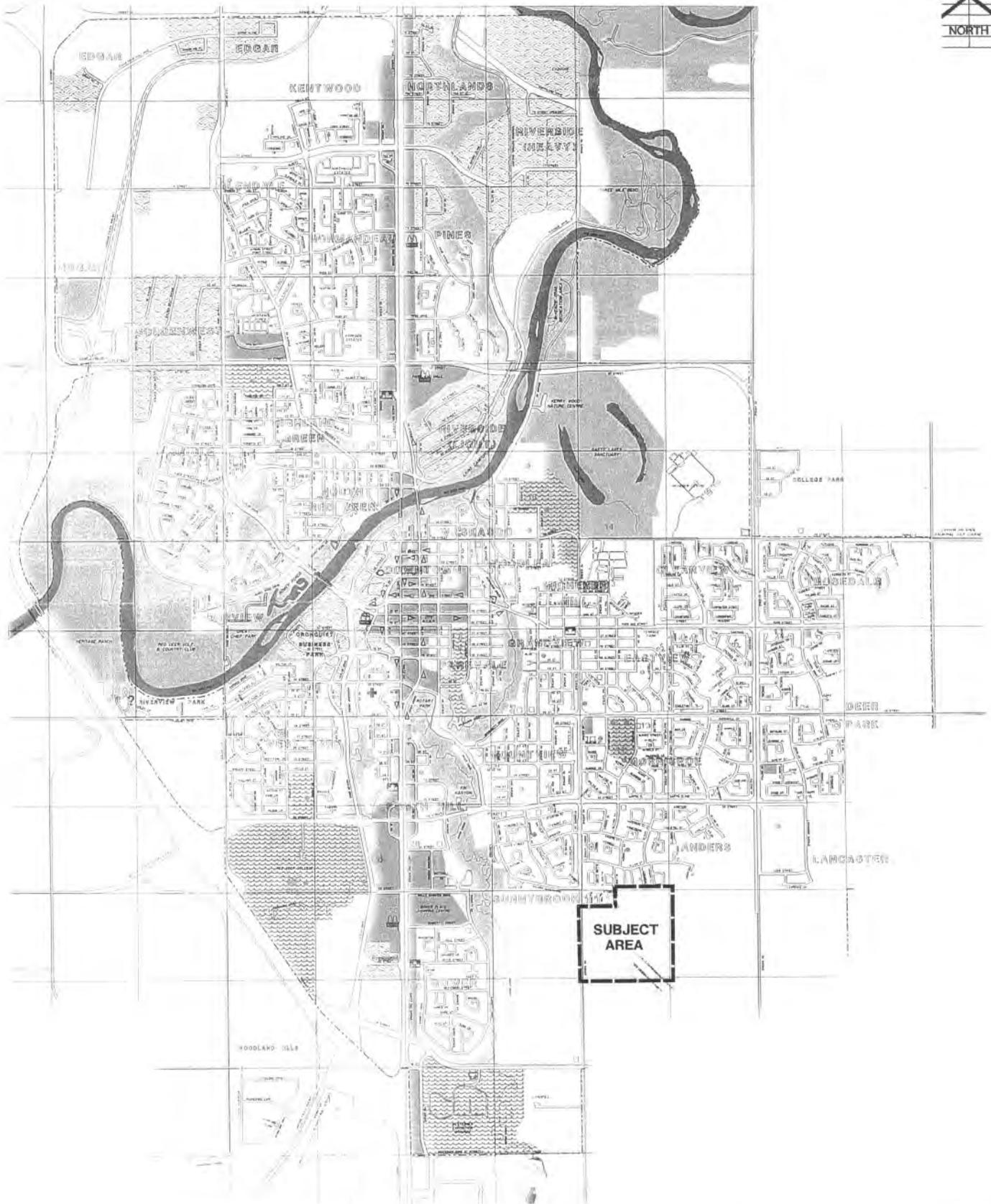
Appendix 3: Land Use Concept – Former Private School Site

1. THE SITE

The study area consists of the quarter section NW ¼ Sec. 3-38-27-W4 located within the City of Red Deer. The site is bordered on the west by 40 Avenue; to the south by the TransAlta right-of-way (north portion of quarter section SW ¼ Sec. 3-38-27-W4); to the east by the quarter section NE ¼ Sec. 3-38-27-W4, owned but as yet undeveloped, by Melcor Properties Ltd.; and to the north by the existing subdivision referred to as Anders Park. The study area's location relative to the City of Red Deer can be found on the attached Location Plan, Figure 1.

At present, the site can be considered under six ownerships. The developed portion in the northwest corner of the quarter section falls under individual homeowners. The Red Deer Christian School owns 3.41 ha; the New Hope Evangelical Missionary Church owns 2.02 ha; Meadowglen Developments Ltd. owns 6.85 ha; The City of Red Deer owns 0.64 ha of previously designated MR land; and the remainder of the section (43.7 ha) is under a conditional agreement to develop between Redbrook Group 2 and Thorvald Nielsen/594544 Alberta Ltd.

The entire parcel consists of 57.93 ha (143.14 ac). The northwest corner (Anders South) was developed in 1987, with 52 single-family lots constructed, sold and, for the most part, has reached build-out. It is important to note that we are considering the development of the remaining undeveloped quarter section. Preliminary analysis has determined that the configuration of the south arterial road, as depicted in the Area Structure Plan and on earlier Outline Plans, and the current layout of the school and church sites do not allow for the utilization of the existing slough for storm water collection, nor does it allow for technically sound planning. We also feel constraints imposed by the location of existing collector road patterns severely limits the developability of the original 43.7 ha (108 ac) being considered by the developers (Redbrook Group 2).



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ANDERS ON THE LAKE
LOCATION PLAN

Figure 1

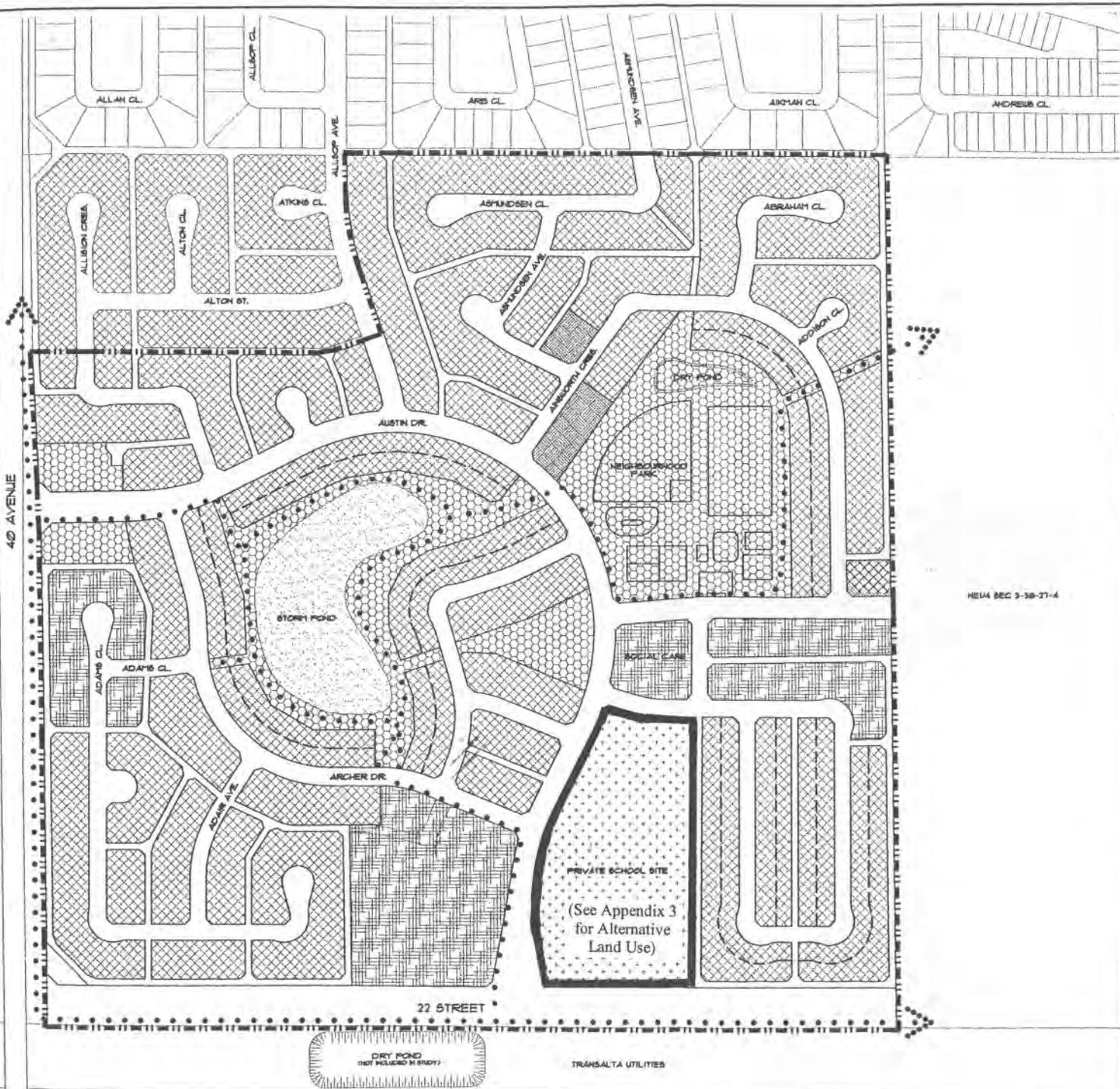
2. LAND USE

The Land Use Concept Plan, as presented in Figure 2, is the result of a series of conceptual designs evaluated for conformity to municipal standards, serviceability, and marketability. The significant feature of this plan is the incorporation of a storm water pond within the community. Currently, the site is designated as follows:

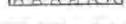
- the existing residential development is R1 - Residential Low Density District;
- the southwest parcel entailing the school and church sites is designated A1 - Future Urban Development District; 3MR - Municipal Reserve; and PS - Public Service District; and
- the remainder is designated A1 - Future Urban Development District.

The study area falls within the East Hill Major Area Structure Plan study area. Statistics for the concept plan are as follows:

- the study area consists of 58.20 ha (143.81 ac)
- 27.51 ha (67.98 ac) are planned for R1 - Residential (Low Density) District
- 0.60 ha (1.49 ac) are planned as R1A - Residential (Semi-Detached Dwelling) District
- 5.12 ha (12.65 ac) for R2 - Residential (Medium Density) District
- 12.29 ha (30.37 ac) are planned as roads/lanes
- 7.26 ha (17.93 ac) are planned as P1 - Parks and Recreation District
- 2.01 ha (4.97 ac) are planned for Public Utility Lots
- 3.41 ha (8.43 ac) set aside for the private school (see Appendix 3 for alternative land use)



LEGEND

-  STUDY BOUNDARY
- LAND USES**
-  (R1) RESIDENTIAL DISTRICT (LOW DENSITY)
-  (RIA) RESIDENTIAL DISTRICT (SEMI-DETACHED DWELLING)
-  (R2) RESIDENTIAL DISTRICT (MEDIUM DENSITY)
-  (P1) PARKS AND RECREATION DISTRICT
-  (PS) PRIVATE SCHOOL SITE
-  (PUL) EXISTING STORM POND
-  WALKOUT BASEMENTS PERMITTED
-  PROPOSED TRAIL

STATISTICS

	ACRES	HECTARES	%
TOTAL AREA	143.81	58.20	100.0
(R1) RESIDENTIAL	67.58	27.51	47.2
(RIA) RESIDENTIAL	1.49	0.60	1.0
(R2) RESIDENTIAL	12.65	5.12	8.8
(P1) PARKS	11.53	4.66	12.5
(PS) SCHOOL SITE	8.42	3.41	5.9
(PUL) STORM POND	4.51	1.83	3.2
ROADS/LANES	30.57	12.29	21.3



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Project

ANDERS ON THE LAKE
 PORTION OF NW 1/4 SECTION 3-38-21-04/1

PREPARED FOR: RED BROOK GROUP 2

Title

LAND USE CONCEPT

Date File Scale Fig. No.
 04JAN01 2505 073 00 01 1:4000 **2BW**

3. RESIDENTIAL

3.1 Sizing

The majority of the site is intended to be R1, single-family residential, with lots ranging in size from 13.7 - 19.8 m (45' - 65') and with a relatively standard depth of 32 - 35 m (105' - 115'). This will maintain the integrity of the existing Anders South and Anders Park subdivision developments north of the quarter. These lots are sized and will be sold with the intention of constructing homes of similar size, style and quality as those existing in the Anders South subdivision. Areas have been designated as R1A and R2 for the inclusion of high-end duplex and townhouse development. Market conditions may dictate that these areas are ultimately designed for single-family residential units.

3.2 Layout

The subdivision has been planned so that the lots along the periphery of the quarter section back onto 40 Avenue, the major collector and the adjacent sections. This eliminates residential access to these major thoroughfares, provides a buffer from the traffic noise generated, and defines the subdivision as an autonomous community. The use of cul-de-sacs and other cluster groupings are incorporated to improve the aesthetic value of the subdivision. The access points off of 40 Avenue and the major collector will entail a full entrance treatment with signage, landscaping, fencing and divided median. It is the developer's intention to plant one full-sized tree per lot in cooperation with the landowner. This will be done with the intention of bringing the subdivision to aesthetic maturity sooner than the normal growth period for freshly planted saplings.

3.3 Walkouts

The lots backing onto the storm water pond are planned to accommodate two storey houses with walkout style basements. This was considered when the elevations for the normal and high water levels were being evaluated for the pond. Potential walkouts have also been identified in the southeast corner of the quarter. The existing topography is conducive to this type of development. Housing for the rest of the subdivision is deemed to be of a normal design with full basements.

3.4 Density

As depicted on the Land Use Plan, we are proposing three land use types for the study area. Using assumed averages of 3.4 persons/unit of R1, 3.3 persons/unit of R1A, and 3.0 persons/unit of R2, estimated density is 30 persons/gross ha of development for a total of approximately 1,850 persons.

3.5 Architectural Controls

In keeping with the vision of a high-end marquis development, the developer will impose a strict set of architectural controls. Understanding that Anders South is currently regulated architecturally, consideration will be given to establishing a transition zone between developments, maintaining the integrity and theme of both areas.

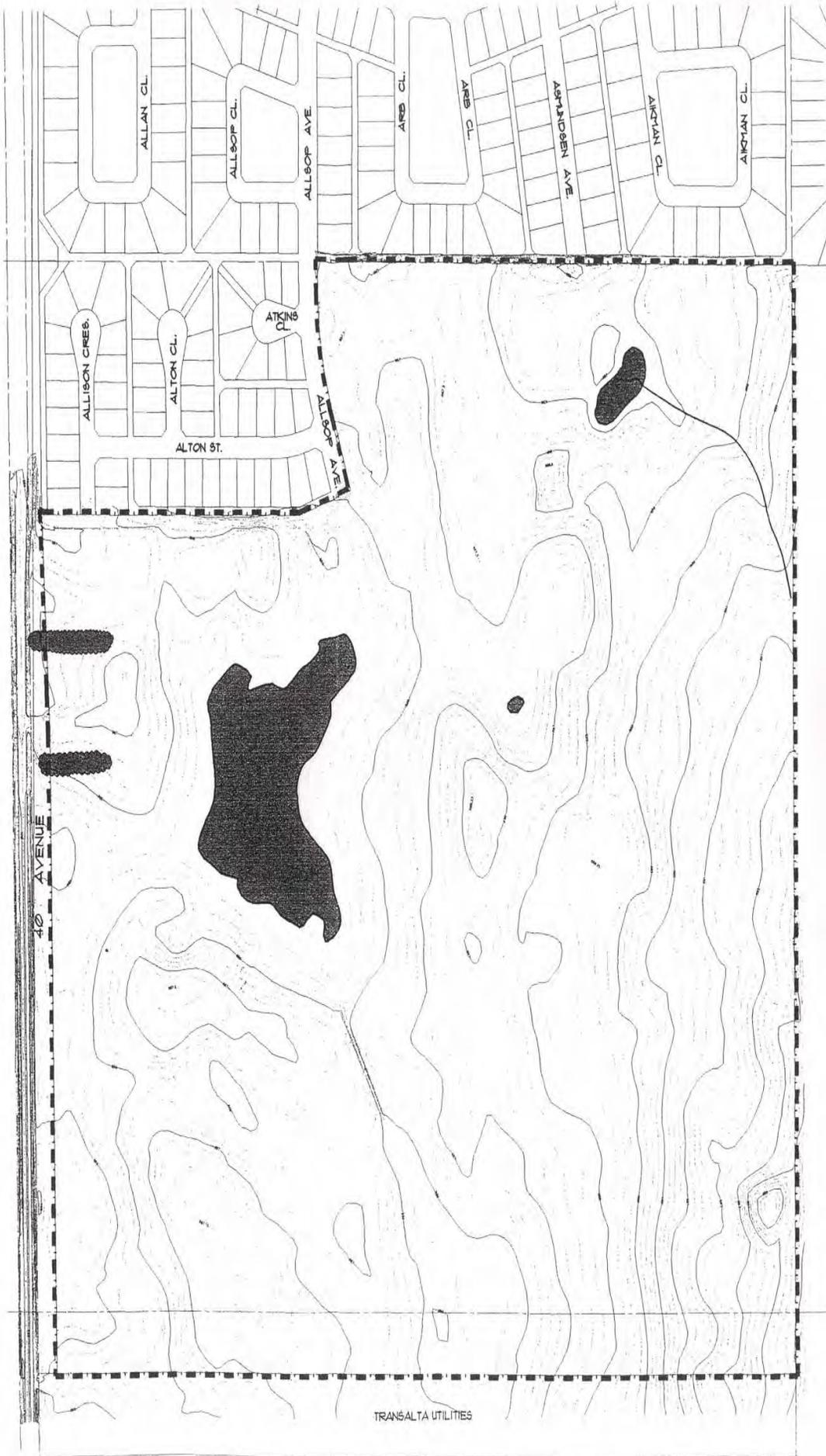
4. NATURAL AND CULTURAL HERITAGE

The ecological profile prepared for this particular quarter section identified three significant features. One is the existing stand of trees located along 40 Avenue about the mid-point of the quarter section. The original south arterial alignment falls directly within the stand, and inevitably would result in the loss of at least one bank of trees. This influenced the decision to realign the major collector along the south boundary of the site, thus preserving the trees.

The second feature entails the existing low area that serves as a natural storm water retention pond for most of the quarter. Again, the originally proposed alignment of the south arterial runs through the low area and raises a variety of concerns. One involves the vertical alignment of the road and remedial measures that may be required, as well as the desire to utilize the existing low area as the location of the storm water management facility, whether it be a wet or dry pond. The third feature is the tree line falling along the east quarter line. We worked in co-operation with the adjacent landowner (Melcor) and reviewed a number of alternatives to retain the trees. Our final conclusion determined retention of the trees to be unfeasible based on the following facts:

- (1) Utilization of a lane, regardless of positioning, will result in substantial tree loss due to deep and shallow servicing cuts, property pins, fencing, and access points.
- (2) The tree quality and nature of the growth would most likely result in the eventual removal by individual property owners.
- (3) Experience dictates that property owners usually remove trees regardless of efforts to retain them by the developer. As a result, the developer intends on removing and transplanting the salvageable trees with the use of a tree spade.
- (4) Required grading for servicing and drainage may result in cutting or filling near the trees causing them to die.

Existing topography and natural ponding areas, as well as the tree stand, are depicted on Figure 3.



LEGEND

--- STUDY AREA BOUNDARY
(143.14 ac/57.93 ha.)

LAND USES

-  EXISTING VEGETATION
-  NATURAL PONDING AREAS
-  EXISTING TOPOGRAPHY

Revisions
13 Jan 97 Update contours



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Project
ANDERS ON THE LAKE
PORTION OF NW 1/4 SECTION 3-38-27-W4M
PREPARED FOR: REDBROOK GROUP 2

Title
NATURAL & CULTURAL HERITAGE

Design Scale Drawn
DJY  CFM

Date File Dwg. No.

13 JAN 98 2102 2505 001 00 05

5. ENVIRONMENTAL HAZARDS

As required with all new developments, a Level I Environmental Site Assessment was undertaken for the full quarter section. Results of that study did not identify any issues that would warrant further studies as the site appears to have historically held only one residence within the development boundaries and operated as an agricultural entity. A copy of the study results were submitted with the original draft copy of the Neighbourhood Area Structure Plan.

6. TRANSPORTATION

6.1 Arterials and Collectors

At the onset of plan preparation for the Anders on the Lake development, the major road system was defined by existing development, as well as the East Hill Area Structure Plan. The Anders Park subdivision to the north was developed on the premise that two collector roads (Allsop and Asmundsen) would continue south into the study quarter directing traffic flow onto the arterials. The Area Structure Plan also identifies a collector that will connect this site with quarter sections to the east. It also identified an arterial that would cross the quarter from the southeast corner and angle up to meet the west limit at the midpoint of the quarter line and continue west through the Bower property and ultimately connect up to Molly Bannister Drive. The only existing arterial currently servicing the site is 40 Avenue bordering the west limit. Designated as a divided arterial requiring a 60 m right-of-way, it will allow for four travel lanes, walkways and sound attenuation berms on both sides. Land to accommodate a road widening has been purchased along the west limit of the site. Land for the widening of the west side of 40 Avenue has not been purchased at this stage.

Some liberties were taken in realigning the proposed arterial from a position bisecting the section in an angular direction, to a new position running parallel to, and north of, the TransAlta Utilities right-of-way. This was done for a number of reasons as noted below:

- The original alignment runs directly across the current low area (slough) which hinders efforts to utilize the existing topography for storm water management facilities.
- It would result in construction difficulties in terms of the fill and earth movement required to build up the road and to develop a dry pond north of the right-of-way.

- The aesthetic benefit of lots backing onto a storm water pond is lost because the required area for the storm water pond limits the size of the developable envelope around the pond.
- The proposed alignment runs through the cluster of trees on the west side of the section and will ultimately result in at least one bank of the stand being destroyed.
- Discussions with the City acknowledged that the true nature of the road was consistent with a major collector, and thus would be classified and constructed as such, as it was recently determined that it would only extend the length between 30 and 40 Avenues. By requiring a noise attenuation berm on the north side of the arterial only, the width has been reduced from the original 60 m.
- It is also felt that the new alignment parallel to the utility right-of-way provides a buffer from the power lines and improves the aesthetics of the subdivision. We are acknowledging health concerns related to residential development in the immediate vicinity of high voltage power lines.
- Location along the south boundary of the quarter section conforms to the City's standard of major roadways on section lines.
- The proposed alignment is not conducive to proper planning as it segregates an odd shaped parcel of land in the southwest corner between the two arterials and the power lines. It also leaves the north parcel restricted due to collector road alignments, storm water management facilities and topography.
- The recent decision by City Council has resulted in ~~elimination~~ of the south arterial crossing Piper Creek connecting to Molly Bannister.

6.2 Collectors

The continuation of the collector road, Allsop, the collector running from the major collector and curving to the west and out to 40 Avenue, as well as the yet unnamed collector running east into the adjacent quarter, will be 20 m rights-of-way directing traffic to the arterial. The two collectors directing traffic to the undeveloped quarters will do so, at approximately the midpoint allowing for flow

into the adjacent quarters. All of these roads are planned according to the City of Red Deer Roadway Design Standards regarding minimum radii, intersection offsets, and corner cuts.

Most of the planned development has easy access to these collectors and out to the arterial. Allsop will feed onto the circular collector that will route traffic west to 40 Avenue or to the major collector, and away from routes through Anders Park. Asmundsen Avenue will not connect directly into the 'Anders on the Lake' community and thus has been downgraded to a local road status.

Understanding that the development of the 'Anders on the Lake' community will add additional traffic flow north into the Anders Park area, particularly towards the school and playing fields, our initial traffic analysis forecasts that some of the existing volume will be re-routed south reducing the demand on the existing network. As is expected with new development, traffic flows are concentrated on a limited number of roads until full development is reached. For this area, the completion of Victoria Park, Anders on the Lake and the Melcor quarter will create a road network that will take the emphasis off the existing collectors in Anders Park. Under the alignment laid out by the current East Hill Area Structure Plan, the traffic flow originating out of the Melcor quarter would be directed in a northwesterly direction, up Asmundsen and through Anders Park. Our proposed realignment takes that flow and directs it west out to 40 Avenue within Anders on the Lake.

We have made a conscious effort to align the west access point within the existing stand of trees in order to be able to preserve them within two MR parcels. This will accent the developer's intention to create a defined community entrance with centre medians, extensive landscaping, signage and perimeter fencing. The collector configuration will also allow for accessible transit servicing to all portions of the quarter. It is understood that the proposed changes to the road network will require an amendment to the East Hill Area Structure Plan. We hope to be pursuing this concurrently with the Neighbourhood Area Structure Plan approval process.

6.2.1 Access to the Inglewood Subdivision

The extension of Austin Drive south of 22 Street is required for future access to the proposed Inglewood Subdivision. The proposed Austin Drive/Collector Roadway and 22 Street intersection design is in conflict with an existing E. L. & P. manhole/pullbox located on the south side of 22 Street. The alignment of Austin Drive/Collector Roadway could be adjusted to eliminate the conflict with this facility. A suggested re-alignment of the Austin Drive/Proposed Collector roadway is shown on the drawing included in Appendix 1. The Anders on the Lake developer will endeavor to negotiate a solution with the Engineering Services Department and the Inglewood Subdivision developer.

6.3 Local Roads

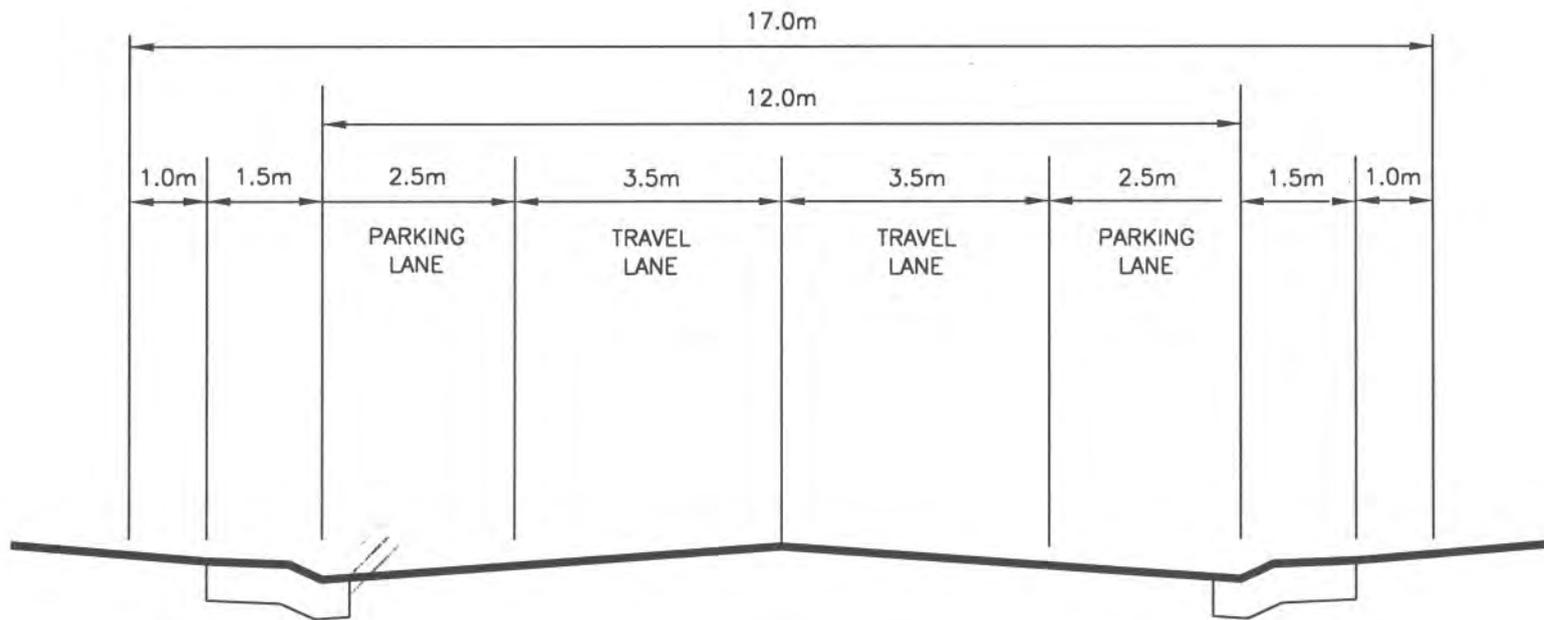
The local roads are planned with 15 m rights-of-way, routing traffic onto the collectors. The loop road west and south of the pond and the roads closer to the higher density development may be designed with a 17 m ROW allowing for a larger 12 m carriageway to handle possible shortcutting and increased traffic flow. This will be decided during the tentative plan stage through discussions with the City's Engineering staff. A typical cross section is included as Figure 4. None of the cul-de-sacs exceed the 230 m maximum length, and have lane access within 90 m of the bulb. Cul-de-sacs have been utilized because of their aesthetic value, as well as conduciveness to pedestrian and child safety.

6.4 Lanes

The majority of the subdivision is designed with access to rear laneways that are 6 m wide. The only variation is behind those lots backing onto the storm water pond, as well as the lots backing onto the neighbourhood park.

6.5 Trail System

The last transportation consideration is the inclusion of the pedestrian/cycle trail as outlined within the Area Structure Plan. The trail, as diagrammed within the Area Structure Plan, allowed for an east-west alignment within the utility ROW, as well as a branch veering to the northwest within the arterial ROW. With the modification to the road network, the trail system was altered slightly. The east-west connection will be maintained on the south side of the major collector within the ROW. From the major collector, the trail will cross at the intersection point with the collector road, travel north and west into the MR adjacent to the storm water pond. The trail will circle the pond with an arm running west along the south side of the circularis collector, access 40 Avenue at the intersection, and join up to the trail on the east side of 40 Avenue. A second arm will lead east across the circularis collector into the neighbourhood park, eventually meandering in a northeast direction moving into the adjacent quarter within the easement established for the sanitary force main. The proposed trail alignment is depicted on Figure 2. Trails planned along collectors or the major collector will be constructed of asphalt or incorporated into the sidewalk construction at a width of 2.5 m. Trails planned around the pond and within the neighbourhood park area will be constructed of crushed shale to a width of 1.5 m.



NOT TO SCALE

7. PUBLIC FACILITIES

We have identified the relocation of the private school of equivalent area within this Neighbourhood Area Structure Plan from the previously approved Outline Plan. It is located on a collector road and next to the arterial, as well as being within a short walking distance of the neighbourhood park and the facilities located there. Included within the park is a dry pond that will be utilized as a playing field and park space, reducing maintenance costs, and maximizing the efficiency of the open space.

The Neighbourhood Park, as depicted in Figure 2, has been laid-out with the cooperation of the City of Red Deer, Community Services Department. Full consideration was given to the Community Services Master Plan guidelines for facilities, setbacks and positioning. We have included a full 100 m x 60 m soccer pitch, a ball diamond with a 92 m outfield, a community shelter, multi-purpose asphalt pad for both summer activities and a winter hockey rink, a basketball court, playgrounds of both pre-school and elementary level, a sliding hill that capitalizes on the dry pond side slopes, space for a winter snow-bank rink, and adequate parking. In addition, the park will be traversed by the trail system and benches will be added for aesthetic as well as user enjoyment.

This plan is precedent setting for the City of Red Deer in that it incorporates a storm water pond central to the subdivision that serves aesthetic and storm water management purposes. The pond is approximately 2.01 ha (4.97 ac) in area. As a storm water management facility, usability is restricted to non-body contact. A setback from the rear property lines will allow for appropriate side slopes, as well as a 1.5 m wide trail encompassing the pond.

A second dry pond is planned within the TransAlta Utilities right-of-way. This utilizes normally unusable land and maximizes the yield that can be expected from the development, as well as reduces the land costs when developing the pond.

8. SOCIAL FACILITIES

One 0.5 ha (1.3 ac) site has been identified for a future social care facility. This site, located at the southeast quadrant of the intersection of Austin Drive and the collector extending east into Aspen Ridge, is planned as the future home of the Red Deer Hospice Society. Siting adjacent to the neighbourhood park, opposite the passive park area and near the lake is viewed as being the optimal location for this facility.

The provision of this site meets the requirements of the City Planning and Subdivision Guidelines. The location on Austin Drive and the collector meets the City requirements for location on a collector road, on a corner site.

In the event that this site is not developed for these purposes and intended use, the alternative land use would be for residential as shown on Figure 2.

9. STAGING

As depicted in Figure 5, the proposed staging for Anders on the Lake is as follows:

- Stage One, as identified on the staging plan, consists of the lands in the northwest corner of the study area. This includes approximately 13 lots fronting the east side of the already constructed portion of Allsop Avenue. Other areas to be developed include the lots south of the existing Anders South subdivision; the collector accessing 40 Avenue, extending east to approximately the neighbourhood park; the north portion of the northeast loop road; and the storm water pond. Access will be provided north via Allsop Avenue and west along the collector to 40 Avenue. This will allow for the closure of the temporary access currently in use in Anders South in turn keeping construction traffic away from the existing subdivisions. Besides the pond, other features to be developed within the first stage include the entrance treatment at 40 Avenue, construction of show homes, and the development of approximately 76 single-family lots including 23 pond side lots. The total area for Stage One is approximately 11.91 ha (29.43 ac).
- Stage Two progresses in a easterly direction to include the northeast corner of the quarter section. The west-to-south collector would be extended to the intersection of the collector heading east into the Melcor quarter. Asmundsen Avenue will be terminated just south of the quarter line. Stage Two will entail the construction of the dry pond and the dedication of the reserve area to the City for the neighbourhood park. Overall, Stage Two encompasses approximately 16.25 ha (40.15 ac), including R-1, R-1A, and R-2 residential land use.
- Stage Three will see development move towards the southwest corner of the quarter including the servicing of the proposed church and school sites. The entrance at the major collector will provide another main access point to the subdivision. Besides portions of the major collector, major development will include approximately ten more pondside lots, an R-2 cluster grouping on the west boundary of the quarter, and a fully landscaped entrance.

- Stage Four concludes development with two specific areas on either side of the main collector (to be completed during this stage). One area is the R-1 residential block adjacent to the pond which includes the final pondside lots and other higher end lots. The second area is the block between the school site and the east quarter line. This will include R-1, R-1A, and R-2 residential development. The completion of this area will create the parcels allocated for the day care and social care sites. The major collector will be completed as part of Stage Four.

It is assumed that within each of the stages outlined, there will be phases that are determined by market forces, financing, servicing availability, and time of year. Recognizing that under existing plans, the school and church sites can be serviced with a temporary access to 40 Avenue, wells, and septic tanks. We have reviewed alternative methods to offer full servicing under the new configuration by extending the services to be developed with Phase 1.

10. SITE SERVICES

10.1 Sanitary Sewer

10.1.1 Off-Site Sewer

Sanitary service to the area closely follows a servicing scheme developed for the City of Red Deer entitled “The City of Red Deer, Red Deer South Areas Servicing Study”, dated June 1990, prepared by Al-Terra Engineering Ltd. in association with J.N. Mackenzie Engineering Ltd. The report examined several alternatives for servicing the south portion of the City, extending to Delburne Road between Piper Creek and 20 Avenue. The report recommended sewage from the study area, plus Section 3 and the east half of Section 4-38-27-W4, be collected in a central location and pumped into the East Red Deer trunk system. The servicing scheme presented here follows this recommendation. As noted on Figure 6, a centrally located lift station in the southwest corner of the study area will collect sewage from the four quarters of land and pump the effluent via a force main to the northeast corner and across a portion of the NE ¼, Section 3 into the East Red Deer trunk system presently located at the south edge of the Anders East Subdivision.

10.1.2 On Site Sewer

The land generally slopes from a high point along the ~~east~~ boundary of the study area to a central low, and then rises slightly to the west to two higher land forms near the west boundary; one at the centre point and the other at the southwest corner. A trunk sewer extending from the proposed lift station in the southwest corner, east along the south arterial and then northeast through the study area, will service the easterly portion. A second trunk sewer, heading north from the lift station, will service the remainder of the area. Based on the overall servicing scheme for the study area, the trunk sewers will be sized to service the study area only except a portion of trunk main on the south arterial, which will service a portion of

the SW ¼, Section 3. Internal mains will service the development, as shown on Figure 6. Servicing will be in accordance with City of Red Deer standards.

For the lots backing onto existing lanes in the Anders Park Subdivision, and Anders South, servicing to individual lots will come from the existing sewer mains in the lanes. Because the downstream trunk sewer servicing the Anders Park subdivision is at capacity, we are proposing the diversion of flows from these mains into the sewage collection system in the study area, thus eliminating the potentially negative impact the study area could have on downstream mains for existing trunk sewers.

10.2 Water Services

10.2.1 Off-Site Services

The recent upgrading of the water distribution system servicing the east portion of the City, (expanding pressure zone #2), places the study area within this higher pressure zone. Pressures are adequate to provide both domestic and fire flows to the study area. No off-site service extensions are required to the area other than the continuation of the major trunk main grid.

10.2.2 On Site Services

The existing 300 mm water trunk main will continue along 40 Avenue, as will a 250 mm main along the east boundary of the study area. There will be one 250 mm link between these mains and all other mains (150 or 200 mm), as required to meet domestic and fire flows. Internal layout is shown on Figure 6.



LEGEND

	STUDY BOUNDARY
	EXISTING STORM TRUNK MAINS
	PROPOSED STORM TRUNK MAINS
	MAJOR OVERLAND FLOW

LAND USES

	EXISTING DEVELOPMENT
	EXISTING PARKS & RECREATION DISTRICT
	EXISTING STORM POND
	PROPOSED DEVELOPMENT
	PROPOSED PARKS & RECREATION DISTRICT

NOTE:

- SERVICE WITHIN EXISTING DEVELOPED AREAS NOT SHOWN
- STORM MAINS NOTED ARE 300mm & LARGER
- EXISTING CONTOURS ARE 0.25M INTERVALS

NE1/4 SEC 3-38-27-4

SW1/4 SEC 3-38-27-4

SE1/4 SEC 3-38-27-4

Scale 1:4000 Fig. No. 7

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Project

ANDERS ON THE LAKE
 PORTION OF NW 1/4 SECTION 3-38-27-4W4M
 PREPARED FOR: RED BROOK GROUP 2

Title

OVERLAND DRAINAGE AND
 STORM SERVICING

Date	File	Scale	Fig. No.
14NOV00	2505 023 00 01	1:4000	7

10.3 Storm Drainage

10.3.1 Off-Site Services

The study area is not serviced with a storm sewer and will, therefore, require a new storm trunk system. The Red Deer South Area Servicing Study examined the south portion of the City and in Scenario D1 recommended the study area plus most of the NE ¼, Section 3, a small portion of the NW ¼, Section 2, a small portion of the SW ¼, Section 3, and all of the NE ¼, Section 4 east of Piper Creek be included in one service basin. The report further recommends a storm water storage facility be included in the study area which services approximately ½ of the NE ¼, Section 3 and the small portion of the SW ¼, Section 3, plus the study area. The storm water storage facility is intended to store storm water from the site and release the water at a controlled rate of 0.00164 m³/s/ ha, via an outfall line to Piper Creek.

The proposed storm sewer system for the study area generally follows this concept. Three storm water storage facilities are proposed for the site for the minor and major storm events, with one off-site trunk line to Piper Creek controlling the rate of release. The alignment of the off-site trunk main will either cross the NE ¼ or SE ¼, Section 4, requiring an easement with the final alignment based on the ability to negotiate with other landowners. Alternately, an alignment within the TransAlta Utilities right-of-way to the south is possible, although an alignment will be difficult due to location of electrical towers.

10.3.2 Storm Water Storage Facilities

Three storm water storage facilities consisting of one wet pond and two dry ponds are proposed for this site, as noted on Figure 7. Storm water from the minor storm will be collected and piped into the wet pond, designed with a capacity to store the minor storm volume. The dry ponds will collect overland flows from the major storm.

The wet pond is centrally located on the site in a natural low area that ponds water for most of the year. Previous studies identified this location for storm water storage facilities. Present City policy is for dry ponds only and, therefore, a wet pond facility will require the City to make an exception to their policy. In our opinion, the wet pond in this location has the following benefits:

- The existing slough where the pond is to be located is believed to be at or near the groundwater elevation and, therefore, a dry pond at this location will require an expensive subsurface drainage system to maintain a dry surface for recreational use.
- The quality of storm water entering Piper Creek will be enhanced after flowing through a wet pond.
- This area was designated previously as the location for a central park and storm water management facility. With the low rate of release permitted to Piper Creek, a dry pond would be flooded with water from only a short duration rain, thus reducing the usable time for recreational use.
- It provides a visual amenity and increases property values in the area.
- More recreation time will be available in the two connected dry ponds as all minor flows will bypass the dry ponds and discharge directly into the wet pond.

The facility will be designed to store the minor storm event from the entire site and adjacent areas, plus the major storm for a small area immediately adjacent to the pond. A small diameter line to Piper Creek, with a controlled outlet, will release the storm water at a controlled rate of $0.00164 \text{ m}^3/\text{s}/\text{ha}$ as determined by Alberta Environmental Protection. The facility will be designed to maintain a constant water level during normal operation and will rise a maximum of 1.8 m during a major storm event. Water quality will be considered during the design, including adequate depth to minimize weed growth, aeration, makeup water from domestic supplies, turnover of water in the facility, and other factors. The pond will be constructed such that the high water level will be below the footing of surrounding houses. Adequate setbacks will be provided with a minimum of 5 m to the property lines from the high water elevation. Safety will also be incorporated in the design,

including maintaining minimal side slopes of 7:1, delineating the normal water level, signage warning of fluctuating water levels, locating park benches, etc., above the high water marks and not utilizing the lake as a recreation facility.

The dry ponds will only function as a storage facility for storm events beyond the minor storm event. The storm collection and overland drainage system will be designed so that when a storm event in excess of the minor storm occurs, storm water will back up onto the streets or other areas. The storm water will then flow overland and enter the dry ponds. There will be no direct connection to the dry ponds to the minor pipe system, thus permitting the dry ponds to be constructed at a higher elevation, eliminating surcharging of storm sewers and weeping tiles for building foundations. Outlet pipes will control outflow and direct the flow from the dry pond to the wet pond for release into Piper Creek.

One dry pond is located in a natural low area in the NE corner of the study area and will collect the major overland flow from the NE part of the study area and part of the NE $\frac{1}{4}$ of Section 3. The facility will also accommodate a ball diamond as part of the Neighbourhood Park.

A second dry pond is proposed in a natural low area located in TransAlta's right-of-way immediately adjacent to the south boundary of the study area. The area within the right-of-way is frozen for any type of development and, therefore, could accommodate a dry pond. We have obtained written agreement from TransAlta to construct this facility within their right-of-way. Similar facilities have been permitted by TransAlta in other communities with the provision that clearance from overhead wires is provided and access to and stability of poles or towers is maintained. This pond would service the south portion of the study area, plus the small portion of the SW $\frac{1}{4}$, Section 3.

10.3.3 Minor Storm System

The five year minor storm will be collected in an underground pipe storm collection system and directed to the wet pond. Two outlets are proposed into the wet pond with corresponding trunk mains. One trunk main will service the north part of the study area, another the south half. The collection system will be designed according to City of Red Deer standards. Location of the storm sewer mains, including 200 mm lines for weeping tile drainage collection, are shown on Figure 7.

10.3.4 Major Overland Flow

During a storm event in excess of the minor storm, control outlets on catch basins will cause water to pond on the streets in trapped lows or flow overland. The major drainage route will be designed to direct water from trapped lows and overland along streets, lanes or drainage routes to the dry ponds. Design of the streets and drainage routes will permit trapped lows for the storage of surface water, to maximum depths permitted for safety, plus allowable maximum velocity for surface water flowing on the streets. Design will consider protection of buildings from flooding during a major event. The major overland drainage routes are shown on Figure 7.

10.4 Shallow Utilities Servicing

Preliminary discussions with the appropriate agencies revealed no major servicing concerns when it came to shallow utilities. It is understood that servicing extensions will be brought south from either the existing Anders Park, or Anders South subdivisions in an orderly manner based on the staging plan presented earlier. The only exception possibly being a hook up to the Telus lines running within the TransAlta right-of-way.

10.5 Solid Waste Disposal

Solid waste disposal and collection will be an extension of the existing City servicing. Collection locations will be in the rear lanes and curb-side where necessary. The study site is located within a quarter section of the landfill site allowing for an easy addition to the collection system.

10.6 Police/Fire Protection

The location within the City of Red Deer boundaries dictates that Police and Fire protection will be derived from the normal City of Red Deer servicing. The water system will include fire hydrants supplying adequate water flows for fire protection. The proposed firehall within the Melcor quarter will place this development within the immediate vicinity of fire protection.

11. THE STORM WATER POND

Due to the precedent setting nature of this proposed development, we are including a description and brief explanation as to the various issues involved with the construction and operation of this pond. It is imperative to note that the pond's primary function is to serve as a storm water management facility.

In order to obtain final approval of the system, the developer is requesting an exception to City policy #4310 - Storm Water Management. Specifically, we are seeking relief from clause (B) Storage Facilities, whereby it states that "where storage facilities are to be maintained by the City, they should be of the dry detention pond type...". By granting the developer an exception to the policy, the City will be better able to monitor and evaluate the effectiveness of this facility before allowing the development of additional storm water ponds.

The reasoning behind the proposed pond is found in the following points. The size of the catchment area, combined with the minimal release rate permitted into Piper Creek, would result in standing water within a dry pond for a lengthy period after most rain events. Discussions with other municipalities have indicated that dry ponds that are frequently saturated are expensive and difficult to maintain because access is limited and repairs frequent. It was felt that aesthetically, the creation of a wet pond would be far more pleasant than a frequently saturated dry pond. Being a storm water facility, the pond is not conducive to body-contact activities. Lakes used for swimming and related activities are recreational only and are not fed by the collection of storm water. At normal operating levels, the maximum depth of water is approximately 3.0 m with a fluctuation range of an additional 1.8 m. Fluctuation changes of this magnitude would pose somewhat of a risk to swimmers if swimming was permitted.

Environmentally, the use of a wet pond over a dry pond will improve the quality of water discharged to Piper Creek. Access to the pond will be permitted to all community members via the open space links and path system. It is our belief, based on discussions with other entities involved with wet and dry ponds, that a wet pond is actually a safer facility. Water

bodies are recognized as safety concerns and people are more cautious around them, especially with regard to children. With dry ponds, people assume they are a dry park space and fail to realize that during and after a storm, they do retain a fair amount of water.

Safety is also a prominent factor affecting the design of storm water ponds. Figure 9 includes a typical storm water pond cross section. For this particular facility, the developer intends on incorporating a 0.76 m high retaining wall that will define the pond's edge at the normal water level. Normal water level will only be 0.3 m deep along the wall. The exact design and materials have yet to be determined, and will be decided in cooperation with the City Engineering Department at the point of detailed design. The hard edge of the retaining wall reduces weed growth around the perimeter and allows for a manicured edge treatment that fits with the vision of the developer. In and around the sedimentation forebays, the developer will create a more natural edge with the inclusion of native vegetation such as cattails and sedge grasses.

Figure 8 also entails a cross sectional view of the proposed pond and adjacent development including normal and high water levels, and building envelopes. This depicts the spatial relationship between the pond, dedicated park space and the residential development.

11.1 Operation and Maintenance

A conscious effort is being made to design the pond to minimize the amount of operation and maintenance required. Specifically, the urban runoff collected via the storm system will be piped by gravity through two submerged inlets into the pond. The inlets are located at the narrower ends of the pond, respectively. Each end will serve as a sedimentation forebay. The sedimentation forebay, as diagrammed below, is a collection area approximately 4 m deep where the runoff is directed allowing sediment and silts to settle. As this settlement occurs, the cleaner water rises and flows over the weir, constructed approximately 30 m from the mouth of the inlet pipe.

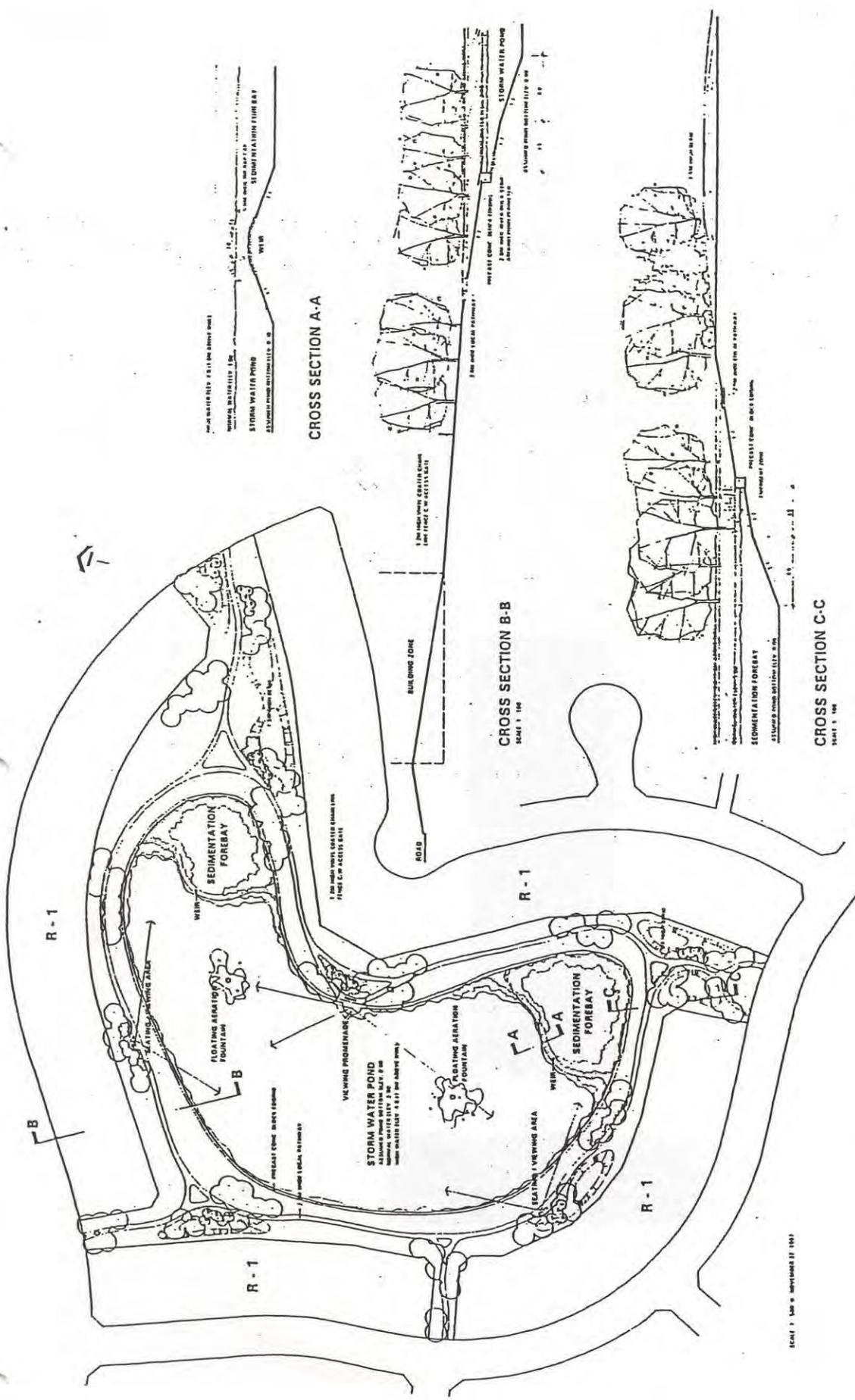
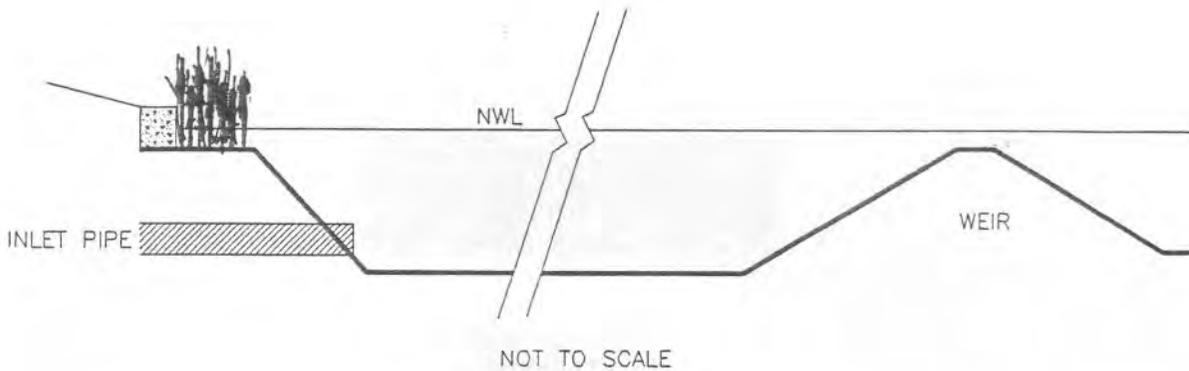


Figure 8

PARK/STORM WATER POND CONCEPT PLAN



SCALE 1" = 10' (VERTICALS 1/2" = 10')



Due to the concentration of nutrients in this area, we are designing the side slopes to accommodate the growth of mature wetland vegetation. We are incorporating the hard edged retaining wall in this area for slope stability and erosion control, particularly with regards to ice force and wave action. Over time, the built up sediment will need to be excavated and the original depth restored. With a proper sediment control program during construction, sediment removal will only be required approximately every 10 years and can be accomplished with a backhoe.

Once the water has made the open body, it will be circulated and aerated by the use of aeration fountains before release through the outlet structure. Aeration and circulation improves water quality, eliminates odours, and retards weed and algae growth. Except for a gradual slope near the retaining wall, the pond will reach maximum depth as quickly as possible which also reduces weed growth and improves water quality. The outlet structure will be a submerged pipe that will direct the outflow towards Piper Creek.

Along with sedimentation removal, other operation and maintenance items include the regular collection of debris that will inevitably flow into the pond, and the

deployment and collection of the fountains in the spring and fall, respectively. This can be done by hand with a small row boat.

The costs associated with these items include annual maintenance costs of \$3,000 to \$8,000 for mainly weed and algae control. The operation costs are limited to electricity for the fountain and is projected to be \$2,000 annually. Building a slush fund to cover miscellaneous items such as landscaping and vandalism repair brings the yearly total to approximately \$12,000. It is important to note that these numbers do not reflect a reduction representative of the annual operation and maintenance costs associated with a dry pond.

11.2 Financing

The precedent setting nature of this pond requires some innovative solutions to both the design and financing questions being raised. We have met many of the design concerns and will continue to throughout the detailed design stage. The capital costs associated with the construction of a wet pond over a dry pond in this location will be covered by the developer. The developer is also proposing a financing plan to cover the operation and maintenance costs that will take the onus off the City and guarantee the longevity of this facility.

Based on the structure utilized in various communities to finance the operation and maintenance costs of amenity items, funding is collected through an encumbrance on the residential lots in the area. For the Anders on the Lake community, each lot developed within the 143.14 acre study area will have an encumbrance on the title pursuant to the provisions of the Land Titles Act (Alberta). The proposed church site and private school will not be encumbered unless they are further subdivided for residential purposes. There is also no vehicle in place to encumber the lots currently developed as Anders South, or as part of any adjacent quarter.

The increased property value for pond side lots is the justification for collecting 50% of the projected \$12,000 annual operating budget. This works out to approximately

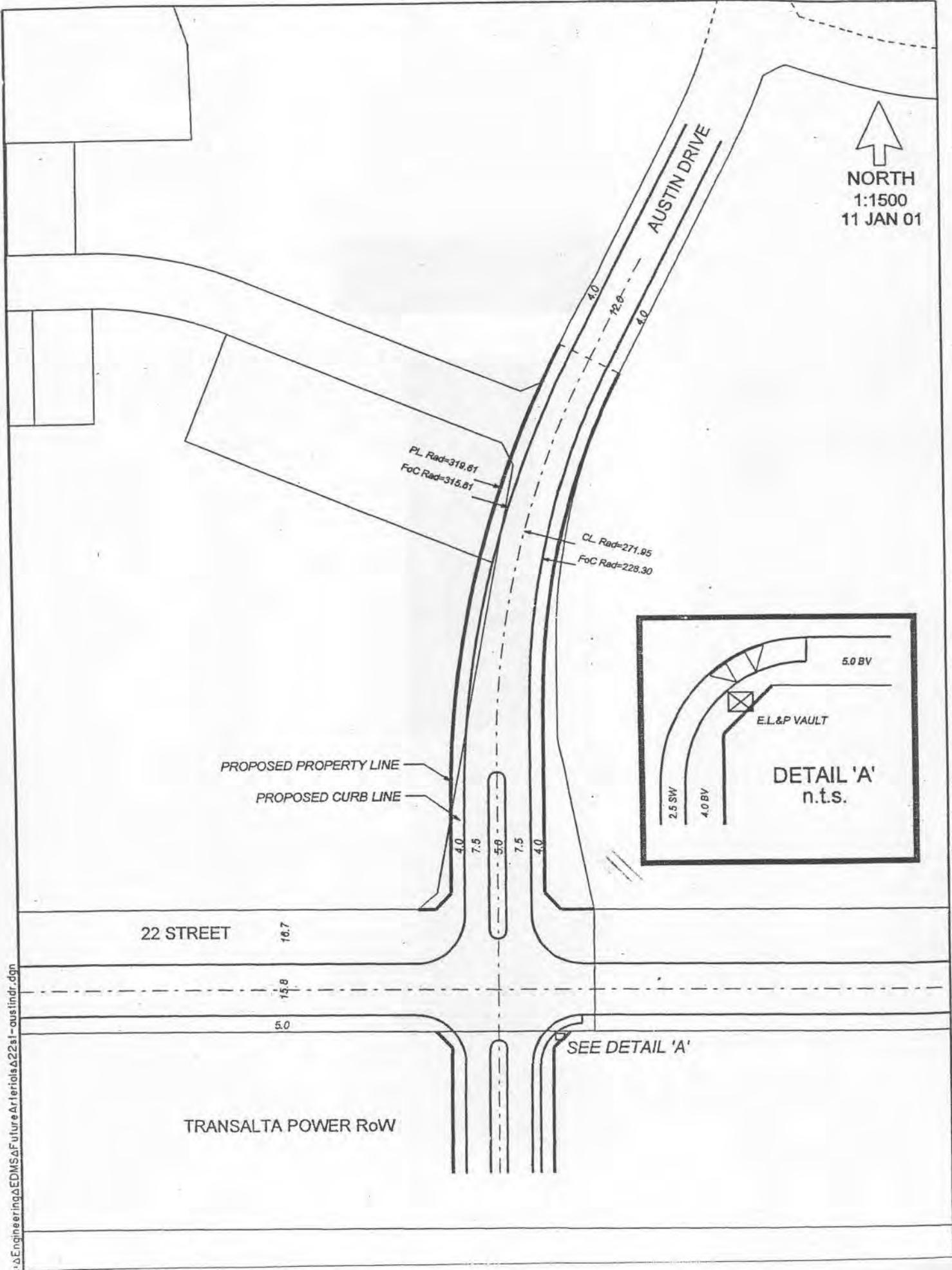
\$115 per year per lot. The balance would be divided equally among the remaining lots equating to a yearly charge of approximately \$25 per year. In the case of a condominium complex, the encumbrance would be calculated per unit. A copy of a typical encumbrance agreement is included in the Appendix. This encumbrance will be based on the Consumer Price Index to calculate increases to meet inflation.

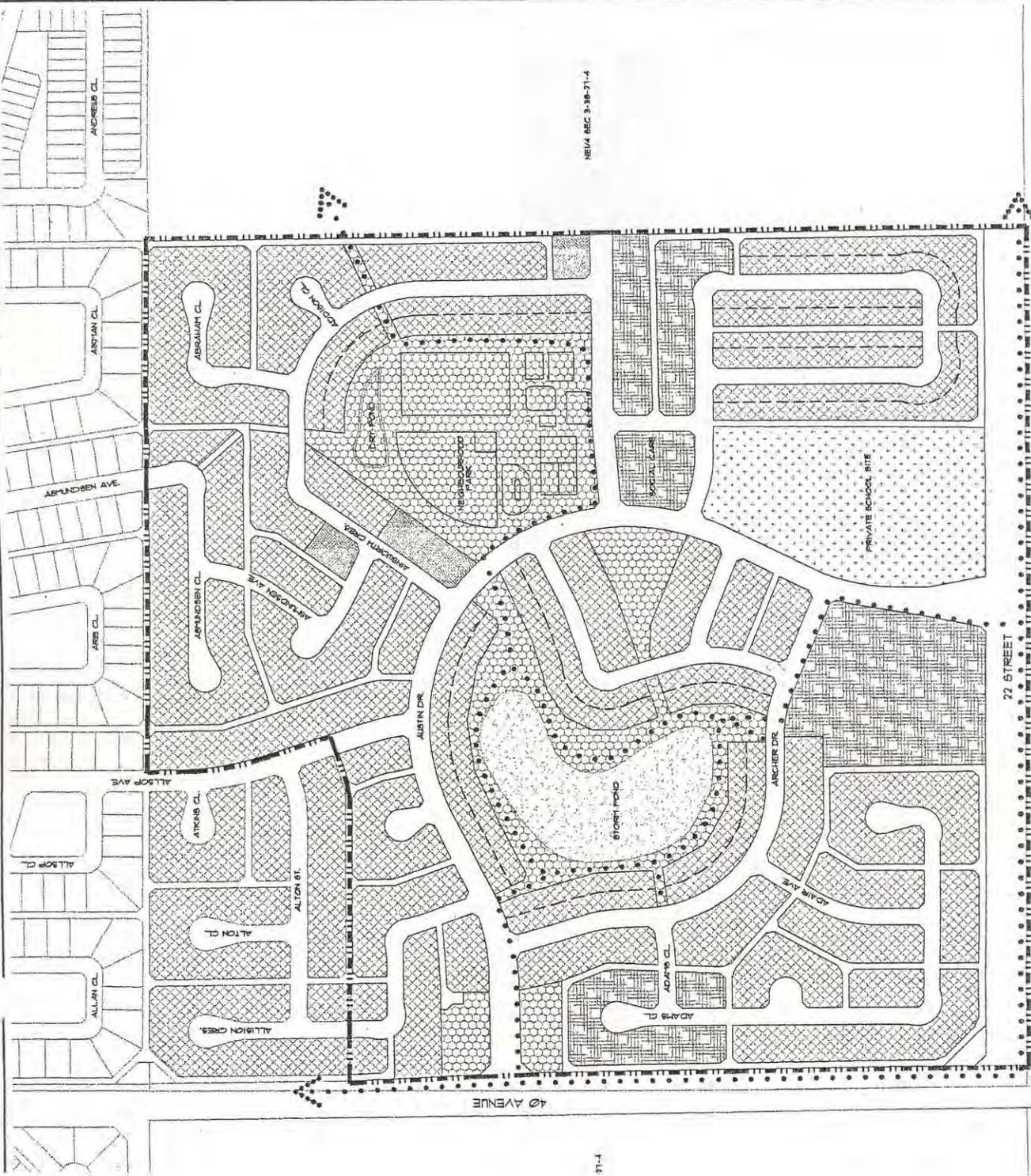
For the first five years, the developer will assume responsibility for the collection of encumbrances and will cover the balance while the community develops. After five years, there are a couple of options. Firstly, the operation and maintenance of the pond, including the collection of encumbrances, can be turned over to the City. Secondly, a community association can be created and the responsibilities turned over to their directors. These details can be worked out with the City during the first few years of operation.

Besides the increased property value associated with the pond, the amenity value will be evident to all community members including those residing nearby in adjoining quarters. The pond is also serving its primary function as a storm water management facility for the entire quarter along with portions of the adjacent quarters. Because of this, it will be imperative that the City include the lot encumbrances as part of the development agreement for any other landowner that may look to develop as part of the Anders on the Lake community as depicted on the Neighbourhood Area Structure Plan.

APPENDIX 1:
Re-alignment of Austin Drive and 22 Street Intersection Details

NORTH
1:1500
11 JAN 01





- LEGEND**
- STUDY BOUNDARY
 - LAND USES
 - (R1) RESIDENTIAL DISTRICT (LOW DENSITY)
 - (RIA) RESIDENTIAL DISTRICT (SEMI-DETACHED DWELLINGS)
 - (R2) RESIDENTIAL DISTRICT (MEDIUM DENSITY)
 - (P1) PARKS AND RECREATION DISTRICT
 - (P3) PRIVATE SCHOOL SITE
 - (F1L) EXISTING STORM POND
 - WALKOUT BASEMENTS PERMITTED
 - PROPOSED TRAIL

STATISTICS

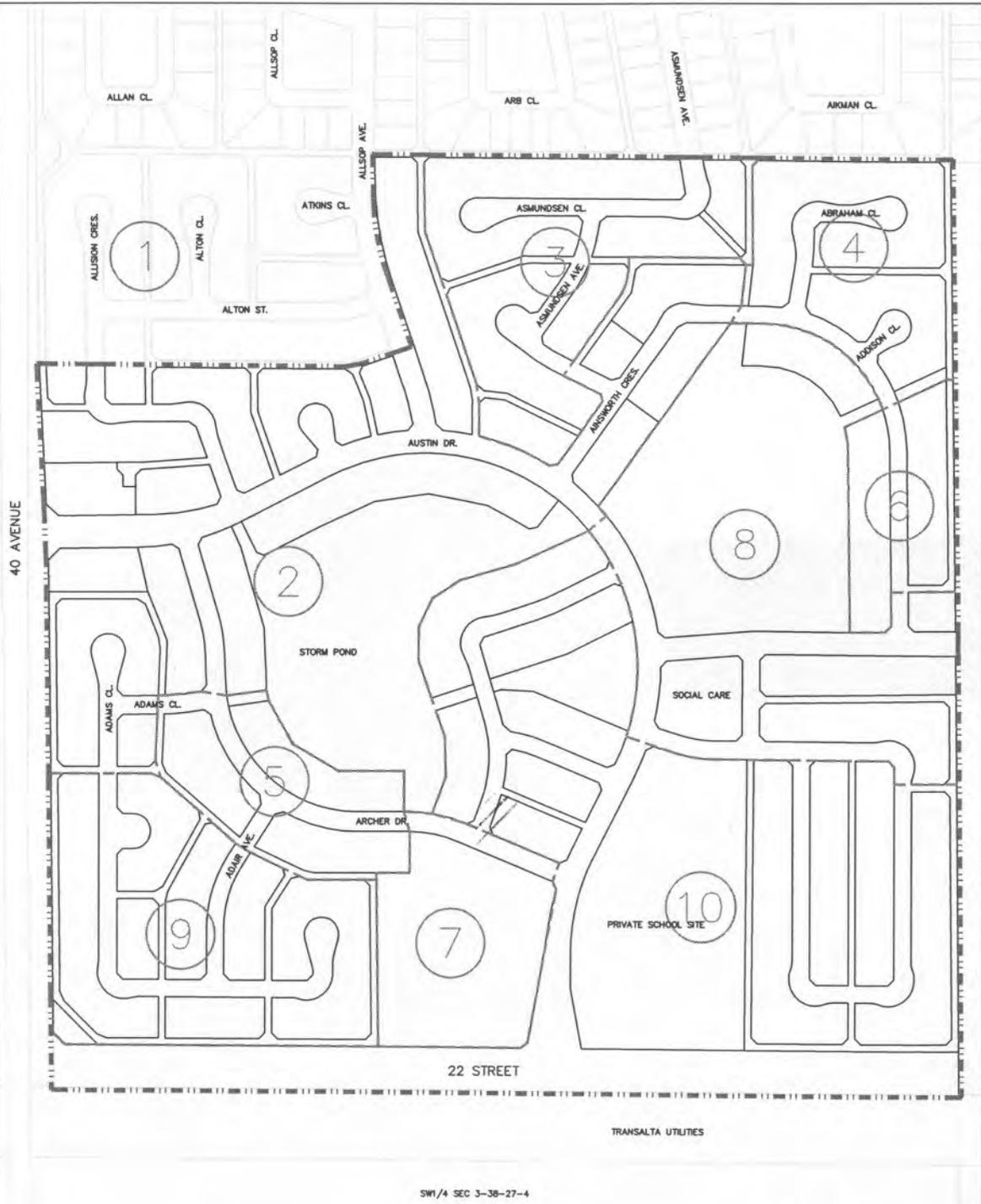
	ACRES	HECTARES	%
TOTAL AREA	143.81	582.0	100.0
(R1) RESIDENTIAL	61.98	251	41.7
(RIA) RESIDENTIAL	1.43	0.6	1.0
(R2) RESIDENTIAL	12.65	5.1	8.8
(P1) PARKS	11.93	4.8	12.5
(P3) SCHOOL SITE	8.42	3.4	5.9
(F1L) STORM POND	4.97	2.0	3.5
ROADS/LANES	30.51	12.3	21.1

UMA
 UMA Engineering Ltd.
 Engineers, Planners, Surveyors
 1000 Highway 101, Suite 100
 Calgary, Alberta
 T2N 2S3

Project
ANDERS ON THE LAKE
 PORTION OF NE 1/4 SECTION 3-38-71-104-1
 PREPARED FOR: RED BROOK GROUP 2

Title
LAND USE CONCEPT

Date: 04-JAN-01
 File: 2505 023 00 01
 Scale: 1:4000
 Fig. No.: 2BW



40 AVENUE

SW1/4 SEC 3-38-27-4

NE1/4 SEC 3-38-27-4

SE1/4 SEC 3-38-27-4

Scale 1:4000 Fig. No. 5

LEGEND

--- STUDY BOUNDARY
 - - - STAGING BOUNDARIES

LAND USES

(EX-R1) EXISTING RESIDENTIAL DISTRICT (LOW DENSITY)
 (R1) RESIDENTIAL DISTRICT (LOW DENSITY)
 (EX-R1A) EXISTING RESIDENTIAL DISTRICT (SEMI-DETACHED DWELLING)
 (R1A) RESIDENTIAL DISTRICT (SEMI-DETACHED DWELLING)
 (EX-R2) EXISTING RESIDENTIAL DISTRICT (MEDIUM DENSITY)
 (R2) RESIDENTIAL DISTRICT (MEDIUM DENSITY)
 (EX-P1) EXISTING PARKS AND RECREATION DISTRICT
 (P1) PARKS AND RECREATION DISTRICT
 (PS) PRIVATE SCHOOL SITE
 (PUL) EXISTING STORM POND

STATISTICS

	ACRES	HECTARES	%
TOTAL AREA	143.81	58.20	100.0
(EX-R1) EXISTING RESIDENTIAL	44.16	17.87	30.7
(R1) RESIDENTIAL	23.82	9.64	16.5
(EX-R1A) EXISTING RESIDENTIAL	1.14	0.46	0.8
(R1A) RESIDENTIAL	0.35	0.14	0.2
(EX-R2) EXISTING RESIDENTIAL	2.40	0.97	1.7
(R2) RESIDENTIAL	10.25	4.15	7.1
(EX-P1) EXISTING PARKS	6.27	2.54	4.4
(P1) PARKS	11.66	4.72	8.1
(PS) SCHOOL SITE	8.42	3.41	5.9
(PUL) STORM POND	4.97	2.01	3.5
ROADS/LANES	30.37	12.29	21.1

SEE FIG 2 FOR CHANGES TO NUMBERS

UMA Engineering Ltd.
 Engineers, Planners, Surveyors
 2540 Kensington Road N.W.
 Calgary, Alberta
 T2N 3S3

Project
ANDERS ON THE LAKE
 PORTION OF NW 1/4 SECTION 3-38-27-W4M
 PREPARED FOR: RED BROOK GROUP 2

Title
STAGING PLAN

Date File Scale Fig. No.
 14NOV00 2505 023 00 01 1:4000 5

4.0 ARCHITECTURAL CONTROLS:

In the keeping with a vision of a high end marquis development, DMC Construction Ltd. will impose a strict set of architectural controls. The architectural controls established will ensure the new area blends in with the existing development that surrounds the subject land parcel.

The DMC architectural controls will meet or exceed the minimum standards as established by Redbrook Group ² Corporation for the remainder of the Anders On The Lake quarter section.

The architectural controls will require a uniform fence in terms of style, color, and height along the rear of the properties abutting Austin Drive, subject to approval by the City of Red Deer.

Muntin bars will be required on all windows located on the front elevations of units. The rear elevations will require upgraded architectural treatment such as balconies, decks, and windows. All roofs will require architectural shingles. All dwellings will require attached garages. No two storey dwellings will be allowed on corner lots at entrances into the subdivision.

Exterior treatments are to be enhanced with features that may include:

- Brick
- Stone
- Pillars and/or Columns
- Buildouts and/or banding

It is the Developer's intention to review and approve all house drawings to ensure they conform to the architectural development guidelines, prior to an application to the City of Red Deer for building permits.

5.0 ENVIRONMENTAL HAZARDS:

As required with all new developments, a Level I environmental Site Assessment was undertaken for the full quarter section. Results of that study did not identify any issues that would warrant further studies as the site appears to have historically held only one residence within the development boundaries and operated as an agricultural entity. A copy of the study results were submitted with the original draft copy of the Neighbourhood Area Structure Plan.

6.0 TRANSPORTATION:

The proposed residential road network will tie into a road system that already exists. The southmost area consisting of a P-loop, will have direct access onto Austin Drive, a collector roadway. The north most area, consisting of a cul de sac, is connected directly to Alberts Close, a neighbourhood residential road.

7.0 SITE SERVICES:

All utilities required to service this subject parcel, including shallow utilities, are located immediately adjacent to the boundaries of this parcel.

In general, the land slopes from east to west across this site. The grade varies from almost no grade differential, at the north end of the site to up to 3.0 metres at the south end of the subject lands.

7.1 Sanitary Sewers, Storm Sewers, and Water Distribution System:

All three of these utilities exist along the east and north boundaries of the subject land parcel. In addition, stubs for each utility have also been extended across Austin Drive, to provide servicing to the west side of the subject parcel. Figure 4 illustrates the proposed layout for the sanitary sewer and water distribution systems for this site. Figure 5 illustrates the proposed layout for the storm sewer system, or the minor, piped drainage system for this site.

7.2 Major Overland Drainage System:

Figure 5 illustrates the major overland drainage route for this proposed development. After leaving this site, the off site major overland drainage routes direct the water to the man made lake. Accordingly, if the amount of rainfall from a major rain storm is more than the minor, piped storm sewer system can handle, the excess water will be routed, overland, along the major overland drainage route illustrated on Figure 5.

7.3 Shallow Utility Servicing:

The shallow utilities required to service this land parcel exist at the perimeter of this land parcel. Accordingly, the existing systems need only to be extended, in order to provide servicing for this proposed development.

8.0 DEVELOPMENT PHASING:

The intent is to develop the whole subject land parcel as one phase.



FIGURE 4
ANDERS ON THE LAKE
DMC CONSTRUCTION SITE
SITE SERVICING -
SANITARY SEWERS & WATER MAINS

SCALE 1:2000
 PREPARED: FEB 5/03
 REVISED: MAR 5/03
 REVISED: MAY 5/03

- BOUNDARY
- - - - EXISTING SANITARY SEWER (ALL 200mm PIPE, EXCEPT WHERE INDICATED OTHERWISE)
- PROPOSED SANITARY SEWER (ALL 200mm PIPE)
- - - - EXISTING WATER MAIN (ALL 200mm PIPE, EXCEPT WHERE INDICATED OTHERWISE)
- - - - PROPOSED WATER MAIN (ALL 150mm PIPE, EXCEPT WHERE INDICATED OTHERWISE)

AL-TERRA
 ENGINEERING LTD.
 EDMONTON RED DEER

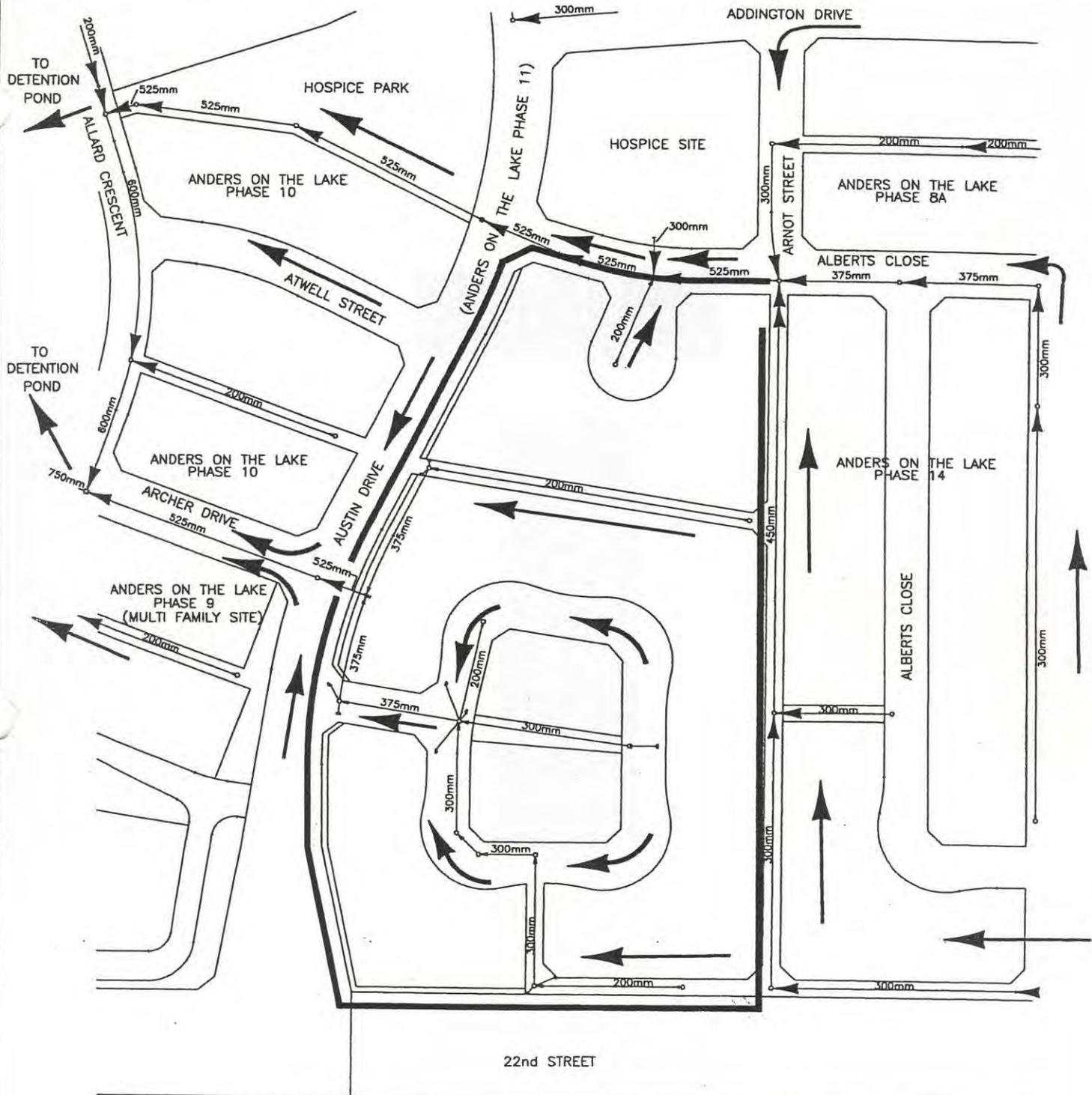
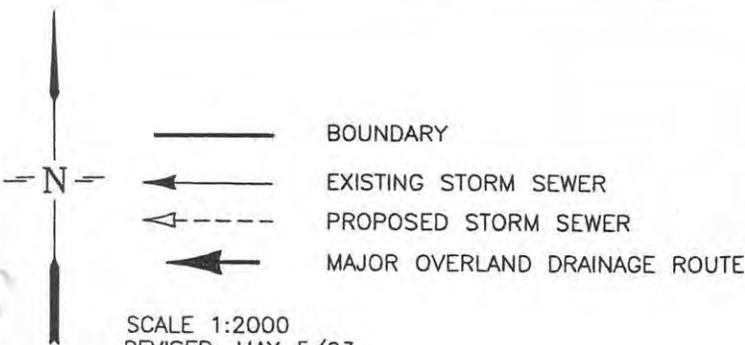


FIGURE 5
ANDERS ON THE LAKE
DMC CONSTRUCTION SITE
MAJOR OVERLAND DRAINAGE
& STORM SEWERS



SCALE 1:2000
 REVISED: MAY 5/03
 REVISED: MAR 5/03
 PREPARED: FEB 5/03

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 ENGINEERING LTD.
 EDMONTON RED DEER