SQUARE BUTTE RANCHES - AREA CONCEPT PLAN SUPPLEMENT (1998)
NORTH HALF 17-21-04 W5 AND S.E. 20-21-04 W5

Mr. Max Gibb, President of Square Butte Ranches, and Mr. Leo Kyllo, Consultant for the developer, were present for the public hearing in connection with the proposed amendment to the previously accepted Square Butte Area Concept Plan for the North Half 17-21-04 W5 and S.E. 20-21-04 W5. Also in attendance were Mrs. Jennifer Gill, Mr. Donald Moench and Mrs. Karen Moench. The public hearing was advertised in the Western Wheel on August 5 and 12, 1998, and circulated to landowners within a half mile of the subject property. The subject parcel is located adjacent to Kananaskis Country, Southwest of Fisher Creek. The current Area Concept Plan for Square Butte Ranches was accepted by Council in 1995. In the accepted Area Concept Plan, a total of 38 units were proposed (26 cabin units, twelve ranchettes). The proposal before Council today differs from the original Area Structure Plan by adding 5 lots for cabin units, and an indoor riding arena to the proposed development. The additional five lots are proposed to be added west of existing Lot 10. They are intended to be part of the existing bareland condominium association. The cabins are proposed to have a septic tank and mounded tile field system to be reviewed and approved by a geotechnical engineer. To develop these lots, an extension of the piped water supply and system will be required. As the proposed road extension crosses (perpendicularly) the drainage path running East/West through the quarter, care should be taken in its engineering to ensure the drainage is disturbed as little as possible. Letters of objection were received from Donald R. and Karen L. Moench and Karen and Jack Whitlie. Areas of concern included population density and the inability of supporting services to support more people, increased damage to the ecosystems, questionable conduct of the developers, the volume of traffic and the noise and dust on the road.

SQUARE BUTTE RANCHES - AREA CONCEPT PLAN SUPPLEMENT (1998)
NORTH HALF 17-21-04 W5 AND S.E. 20-21-04 W5

1273 Mr. Goettler moved that Council approve the Area Concept Plan, as amended.

CARRIED

1274 Mr. Groeneveld moved that the developer be informed that, if he were to proceed with subdivision of the additional 10 and up to 5 lots there would be an increased assumption of costs by the developer with regard to road maintenance based on the proportion of lots in the area using the municipal road system related to the Square Butte Development.

CARRIED

1275 Mr. Berglund moved that staff be instructed to draft a bylaw to set the lot densities based on the approved Area Concept Plan and its amendment.

SQUARE BUTTE RANCHES

AREA CONCEPT PLAN SUPPLEMENT
1998

Submitted to the Municipal District of Foothills No. 31
June, 1998
By
Square Butte Ranches Ltd.

Prepared by
Kyllo Planning & Development Ltd.

KYLLO PLANNING & DEVELOPMENT LTD.
155 MILLRISE DRIVE S.W.
CALGARY, ALBERTA, CANADA
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TELEPHONE (403) 256-3337
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June 22, 1998

Reeve Laycraft & Members of Council
Municipal District of Foothills No. 31
High River, Alberta

Dear Sirs,

Square Butte Ranches
Area Concept Plan Supplement

On behalf of Square Butte Ranches Ltd., I am pleased to submit the supplementary report for the continuation of the Resort Recreation project. The development is proceeding at a more rapid rate and we are confident that the completion of the project as presented herein will establish a resort of the highest quality.

Thank you for the advice and assistance offered by your staff in the preparation of this report.

I look forward to further project involvement in the Municipal District.

Sincerely,

Kyllo Planning & Developments Ltd.

Leo Kyllo, President

cc: Square Butte Ranches Ltd.

CONTENTS

PLANS

Section 1

Introduction

1.0 Background

In 1995, an Area Concept Plan was prepared for Square Butte Ranches in support of an application for redesignation to Resort Recreation District in the Land Use Bylaw of the Municipal District of Foothills No. 31. The application was for the north half of Section 17 and the southeastern quarter of Section 20 in Township 21, Range 4, West of the 5th Meridian and was approved December 7, 1995.

The Area Concept Plan addressed the suitability of the site for this land use as a means to advance the development which had been approved by the M.D. through a Development Permit in 1989. The report described the land area and its attributes, the development proposal and procedures for implementation. Included was an environmental impact assessment and a geotechnical and groundwater analysis.

The 1995 Area Concept Plan proposed to construct only a portion of the Phase 1 development approved by the Development Permit and specified in Order 32/89 of the Municipal District of Foothills No. 31 Development Appeal Board, which had refused an appeal against the Development Permit. Within Phase 1, 48 units of accommodation had been approved, of which 38 were identified in the Area Concept Plan. It was proposed that the additional 10 units be considered as a second stage, along with additional accommodation or development identified as Phase 2 in the original application. The future development, if warranted by market demand, would require evidence it could be constructed in keeping with the environmental and functional constraints of the site.

The original name for the project was Maximum View Ranch. The concept was initiated by Mr. Max Gibb, who was the owner of the adjacent Maximum West Ranch Club. When Maximum West was sold, a name change was required and Square Butte Ranches was selected. The development team now includes Mr. Gibb, Mr. Joe Killi and Mr. Mike Supple.

1.1 Purpose of the Supplemental Report

This report has been prepared as a supplement to the 1995 Area Concept Plan. It provides an up-dating of the project to its current status and proposes that an additional 15 cabin sites be approved for Square Butte Ranches, as these can be developed without significant environmental impact.

Square Butte Ranches Ltd. requests that the Municipal District:

- Ratify the continuation of the development program with the addition of the 10 cabin units currently approved, and

- Allow an additional 5 cabins to be developed.

Section 2

Project History

2.0 Review of Major Events

Square Butte Ranches has taken nearly ten years to evolve, from the first concepts to the quality development now underway. Because of this lengthy timeframe, it is felt that a brief review of the project history is in order. The following is a chronology of some of the most important events and approvals:

July 11, 1989	Application by Maximum View Ranch for Development Permit as a Recreational Lodge under the Agricultural Conservation District, Phase 1 to comprise 48 units of accommodation and Phase 2 with 32 units.
July 19, 1989	Approval of Development Permit No. 6371 by M. D. of Foothills for Phase 1.
August 3, 1989	Development Permit appealed.
August 24, 1989	Public Hearing before Development Appeal Board.
September 13, 1989	Development Appeal Board Order No. 32/89 refusing the appeal and ratifying Development Permit No. 6371 for Phase 1 with conditions.
September, 1989 to March, 1990	Preparation of Master Plan for Maximum View Ranch.
April 9, 1990	Presentation of Master Plan to Municipal District Council for information.
July 20, 1992	Municipal District notified of project name change to Square Butte Ranches.
1992 and 1993	Concept revisions, design modifications, site survey, water well testing, construction of dam and pond, construction of first cabin, construction of fences and corrals. Municipal District confirmed that development under Development Permit No. 6371 had commenced.
February 24, 1994	Resort Recreation District approved as a land use within the Municipal District of Foothills No. 31 Land Use Bylaw No. 566.

June 3, 1994	Application for redesignation of N.1/2-17 and S.E.1/4-20-21-4-W5 to Resort Recreation District to provide for bareland condominium sales of property.
September 8, 1994	Public Hearing respecting application for Redesignation.
September 15, 1994	First Reading of redesignation Bylaw 102/94 stated a condition that an Area Concept Plan must be prepared by Square Butte Ranches Ltd.
February 2, 1995	Submission to M.D. Council of Area Concept Plan for Square Butte Ranches.
February 16, 1995	Second Reading of Bylaw 102/94.
December 7, 1995	Third Reading and approval of Bylaw 102/94.

2.1 Development Status

Since the spring of 1995, development of the project has proceeded with legal survey, construction of internal roads, water well drilling and testing, design and installation of piped water system, site fencing, pond construction and marketing activities.

The upgrading of the Municipal District road leading to the site was undertaken in the summer of 1997, the time at which four additional cabins commenced construction. The livery stable and "saloon" (community hall) were also constructed in 1997. In 1998, completion of the ranch centre is planned, with construction of the townhouses, the environmental centre and an outdoor riding arena. If approved, an indoor equestrian centre is planned to follow in 1999.

Marketing has accelerated since the 1995 redesignation to Resort Recreation District provided buyers with the opportunity for individual ownership of their cabin / townhouse site and of common ownership of ranch facilities.

Of the 26 cabin sites developed in Phase 1, 22 have been purchased and construction on these by the owners will proceed over the next two years. The majority of the 12 townhouses are expected to be constructed by the developers in 1998 and reservations have been received for 2 to this point. Sales of the remainder of Phase 1 is expected to be completed by mid-1999.

Section 3

Phase 2 Development Proposal

3.0 Proposed Expansion

The developments proposed to be added to Square Butte Ranches include an additional 15 units of accommodation (10 of which are already contained in Development Permit No. 6371) which are proposed as cabin sites, an indoor equestrian centre and the associated roads and utilities. This expansion will be the final accommodation development for the project, bringing the total to 53 units. Any further works will be limited to common facilities and improvements.

The layout of the full development is presented in the Phase 2 Concept Plan on the next page. Specifics of the proposed development program follow in the next paragraphs.

3.1 Cabin Locations and Services

The Concept Plan shows the location of the additional 15 cabin sites and the internal road connections. Seven of the sites are located in the N.E. and eight in N.W. quarter of Section 17-21-4-W5. All lots have a designated building location which is within tree cover, thereby protecting views from other cabins and the common ranch properties. While development is proposed for the westerly quarter section of the land area, it extends just into this parcel. The majority of this quarter will remain undeveloped.

Roads will be developed at the same standards as the previous development. Grades will be less than 8%. Cuts and fills will be relatively minor as most of the route is located on gentle slopes.

Water will be supplied by a piped system connected to the supply, treatment and storage facilities constructed over the past year. The forecast water demand is less than 9 gallons per minute. Further discussion of water supply will be presented in the next section.

Electricity, natural gas and telephone services will be by underground extensions.

Construction of cabins will be controlled through the same procedures as are currently in place.

3.2 Equestrian Centre

As a part of the proposed accommodation expansion, Square Butte Ranches Ltd. is proposing to construct an equestrian centre consisting of an indoor arena and associated corrals. These will be connected to the previously approved outdoor riding ring. Based on preliminary planning, the proposed site is shown on the Development Concept. Some adjustment may be necessary but this will be the general location for the facility.

Section 4

Current Development and Management Conditions

4.0 Area Concept Plan Requirements

Within the 1995 Area Concept Plan for Square Butte Ranches, a number of development and management conditions were advanced. This section will briefly review and provide an appraisal of the suitability of these. The appropriate application of these conditions to the Phase 2 development is also described.

4.1 Environmental Controls and Wildlife Protection

Within Section 4 of the 1995 Area Concept Plan, a number of measures were proposed to ensure that wildlife, vegetation, surface waters and soils were protected. These have been implemented as follows:

- Removal of vegetation has been kept to a minimum for the development to date and the expansion will be under similar controls. As the first stages of construction are only now being completed, revegetation of exposed soils and disturbed areas is currently being undertaken.

- Wildlife protection is being advanced through the design and construction of the project and by establishing operational procedures and controls over patron use. These include the construction of rail fences for easy movement of wildlife, locating roads and paths away from movement corridors and bedding areas as much as possible, retaining habitat especially winter forage and nesting / birthing areas, control over pets and staff surveillance over patron activity. Continuation of these programs is assured and additional development of wildlife habitat and nesting sites will remain a ranch policy. Fencing of streams and ponds to prevent damage by livestock is now underway and rehabilitation of disturbed sites will be completed during the summer of 1998. Stocking ponds with fish and other aquatic species will be considered and the necessary approvals from Alberta Fish and Wildlife will be acquired. Ranch owners are being advised of the need for wildlife protection through the condominium bylaws, ranch club rules and architectural controls. The owners are held responsible for their guests.

4.2 Ranch Operations

Square Butte Ranches is just now moving into the operational stage with staff being retained to carry out management and to provide ongoing maintenance. Interim Boards of Directors for both the Ranch Club and the Condominium Corporation have been struck and full elections will be held when 80% of the units have been sold. Staff responsibilities and reporting procedures have been established. Daily reports of ranch use are now being developed for the information of the Boards. Relevant portions of these records, such as unit occupancy, will be forwarded to the Municipal District beginning in September, 1998.

Rules for patron conduct and operating procedures have been developed for both the Ranch Club and the Condominium Corporation. Management and staff have the responsibility to enforce these requirements.

The Ranch Centre, presently consisting of the "saloon" (community hall), stable and associated corrals, is the focus of activity for recreational and social purposes. It also serves as the operational and administrative hub. Its location, near the eastern boundary of the project, reduces the impact on the more isolated portions of the site.

4.3 Slope and Soil Protection

Development to date has proceeded with the benefit of geotechnical advice. Road cuts and fills and disturbed slopes are sound. Buildings sited on slopes greater than 12% have required geotechnical input as a part of the building permit process and septic fields have been designed by engineers.

4.3 Building Foundations

As required by the building permit process, building foundations have been constructed with geotechnical advice where necessary. No blasting has been required, even for the North Cabin area. As similar foundation conditions will be encountered in Phase 2, the same process will be followed.

4.4 Municipal Road Upgrading

While the slow pace of the initial development delayed the off-site road construction until 1997, the widening and re-grading has been completed and final surfacing and dust control will be carried out this July. Square Butte Ranches Ltd. is prepared to provide dust control measures to the secondary access point for the project located at the north gate.

4.5 On-Site Road Development

Road design and construction methods have been satisfactory and there is no evidence of any instability or erosion. Revegetation of exposed soils will be completed during the summer of 1998. The only adjustment to the plan presented in 1995 was shifting the main access road crossing the stream to a location just above the upstream pond. This was necessary to provide better construction conditions requiring less fill and gentler grades.

The roads into the proposed expansion area are expected to encounter similar conditions as experienced in Phase 1. Design and construction methods use to date will be continued. Slopes of less than 8% will be accomplished except for short sections of low traffic roads. Only minor cuts and fills are expected. The first portion of the extension, leading west from Lot 10, will

encounter moist, high plastic soils, based on evidence from the previous geotechnical investigations. Installation of geosynthetic mats and ample granular fill is planned.

4.6 Trails

As there have not been many patrons frequenting the ranch up to now, little trail construction has been completed. Following the plan advanced in 1995, trail development will be undertaken during the summer of 1998 to accommodate increasing visitation. Care will be exercised to prevent disturbance of vegetation and wildlife. Erosion control will be applied.

4.7 Water Impoundments

The first impoundment, the westerly pond, was constructed during 1994. This facility is functioning well and will serve as a source of water for fire fighting. The excavation of the organic soils from the downstream pond was conducted in 1997 and, after adequate drying, the dam will be constructed this year. Revegetation of the margins of the ponds will be completed during the coming summer. Stocking with fish and the introduction of frogs or other aquatic life will be reviewed with the appropriate authorities.

4.8 Drainage Control

The design and construction of roads and improvements have been conscious of the need to direct drainage to retention areas and vegetative filter beds in order to prevent increased run-off, pollution and siltation of water courses. For the most part, this has been accomplished and the completion of the second pond will further that intention. Additional retention or filtration will be provided as required. Similar methods will be used during the Phase 2 development.

4.9 Water Supply

Investigation of groundwater sources continued after the completion of the 1995 Area Concept Plan. In 1997, a deep well was drilled just north of the ranch centre to a depth of 120 feet. This well was tested using Q20 methods at 3 gallons per minute and, in the opinion of Thurber Consultants, the geotechnical advisors, it taps a different source than the other wells and springs on the site.

Water Well #3, located west of the ranch centre, was previously tested at a yield of 3 gpm, also using the Q20 method, but it contains iron. The spring located within the ranch centre was tested (but not subjected to a Q20 analysis) at a long-term yield of 4gpm of sweet water. This source has been flowing at a constant rate for more than forty years. An adjacent spring was used as a source of water for a homestead dating back to the early days of the century.

These sources are all felt to be from independent aquifers based on consideration of depth, water composition and no observed changes in flow or water level during tests. Five other wells of somewhat lower productivity have been drilled and cased. These remain as standby sources. Further deep drilling could also be explored.

The water demand for the full development of 53 units, including Phase 2, is projected at just under 9 gpm. This is based on consumption averaging 240 gallons per unit per day, a volume which would nearly serve an urban household on a year-round basis.

The Square Butte Ranches lodging is intermittent and the number of occupants is normally fewer than three. The cabins and townhouses are required to have low-flow plumbing fixtures and water charges are levied on metered consumption. Consumption for one cabin has been monitored over the past five years and a second for eight months and has been far less than 200 gallons per day. According to suppliers who service recreational properties, typical water consumption would be 30 gallons per person per day that the unit was occupied.

The projected demand of 9 gpm is felt to be conservative. The long-term supply of 10 gpm using the two tested wells and the spring would appear to be more than sufficient. This will be analyzed further and a determination of realistic demand established through the licensing process. Consumption will be monitored as the project receives more patronage.

Peak daily demands, such as on weekends or when guests arrive, can be met through storage. Each cabin is required to install a 1,000 gallon cistern and the central treatment plant and pumphouse has a 20,000 gallon reservoir. This combined storage nearly equals a ten day supply at the calculated unit demand.

The construction of cabins on all 41 sites and the sale of all 12 townhouses is expected to take more than five years to complete. This will allow the water consumption to be monitored and, if additional capacity is required, additional wells can be connected to the system. In the event of a system breakdown or supply difficulties, the individual units could be served by truck delivery to the storage facilities.

The water treatment system incorporates filtration, iron removal and clorination before pumping to the individual cabin cisterns. The central treatment plant is located just north of the townhouses, a location different than that shown in the 1995 document. The system has recently been completed and the necessary applications for licenses to divert groundwater and an operating license will be submitted to Alberta Environment early this July.

4.10 Sewage Disposal

Septic tank and field systems have been installed for all existing cabins and will be utilized for all new units. These are required to be designed and inspected by a geotechnical engineer, a procedure specified in the building permit. This method of sewage disposal is the most suitable for the area and the occupancy. It will be continued for the remaining development and management will monitor the operations.

4.11 Solid Waste Control

Because the full scope of the project is yet to be reached, separation of wastes and recycling programs have not yet been initiated but these are planned. Meanwhile, collection in animal proof containers is the standard procedure and disposal to the regional system will continue.

Construction wastes are collected and disposed of to approved sites.

Manure disposal to pastureland will continue.

4.12 Franchised Utilities

Electricity, natural gas and telephone services have been installed underground and are serviced by franchised companies. These will be extended to Phase 2. Cable television is not provided but cabin and townhouse owners are allowed to install miniature satellite dishes.

4.13 Service Facilities

An environmental centre will be constructed near the stable in 1998 to house maintenance operations.

4.14 Fire Protection

Because cabin development is now reaching a significant stage, the full fire protection system is warranted. This will include facilities to draw and truck water from the ponds, provision of equipment, staff training and servicing of cabin fire extinguishers. The perimeter of each cabin will be monitored for fire hazards by management and an ongoing information program will be instituted. Because each cabin is equipped with a water cistern, a sprinkler system may be possible at a reasonable cost and result in reduced insurance premiums. This option will be investigated.

4.15 Implementation Procedures

The implementation procedures identified in the 1995 Area Concept Plan appear to be working well and will be continued for the proposed expansion.

Section 5

Conclusions

5.0 Request for Expanded Development Permit

By way of this Supplement to the 1995 Area Concept Plan for Square Butte Ranches, a request is being made for a minor expansion to the approved development program for Square Butte Ranches by the addition of five cabin sites and an indoor equestrian centre. This expansion can be accomplished without significant impact to the site and its surrounding landscape. This development will cap the accommodation limit for the project at 53 units.

5.1 Concluding Remarks

It has taken Square Butte Ranches Ltd. a considerable amount of time to reach the present level of development. The completion of the project as outlined herein is expected to proceed more quickly due to economic conditions, buyer preferences, an attractive product and project inertia. These have all contributed to recent sales. The merits of the project, supplemented by the confidence and tenacity of the developers, have allowed it to achieve the high quality it is today.

The exceptional quality of Square Butte Ranches will be continued. Quality stimulates quality as a recipe for success. Sensitive design has been matched by responsible construction under the watchful eye of accountable owners.

SQUARE BUTTE RANCHES LIMITED

Bylaw No. 102/94 was given one reading on September 15, 1994 and the Planning Officer informed Council that the conditions as outlined regarding:

1. Servicing and utilities
2. Conclusive geotechnical information
3. Esso evacuation plan
4. Utilities in winter and proper garbage disposal

have now been addressed in an Area Concept Plan.

256 Mrs. MacDonald moved that Area Concept Plan entitled "Square Butte Ranches" being N-1/2 Section 17 and SE 20-21-4 W5M be adopted.

CARRIED

February 2, 1995

Municipal District of Foothills No. 31
Box 5605
High River, Alberta
T1V 1M7

Attention : Reeve F. Groeneveld and Members of Council

Dear Sir:

Area Concept Plan
Square Butte Ranches

I am pleased to submit to the Council of the Municipal District of Foothills No. 31 the Area Concept Plan for Square Butte Ranches. I am confident that this document will provide solid direction and guidance to both the developers and the Municipal District as the innovative project comes to reality.

We would appreciate Council's early attention to this plan and to the further readings to the Land Use Redesignation for the subject property. We are anxious to continue our work on the project.

On behalf of the partners of Square Butte Ranches Ltd. and the consulting team, I wish to thank Council and your staff for the cooperation provided to us and to compliment the staff for their professional and diligent efforts over the past months.

Sincerely,

Kyllo Planning & Development Ltd.

Leo Kyllo

Leo Kyllo, President
lk/

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Section 1

Introduction

1.0 Purpose of the Plan

This Area Concept Plan has been prepared on behalf of Square Butte Ranches Ltd. in support of the application to the Municipal District of Foothills No. 31 for Redesignation to Resort Recreation District of the north half of Section 17 and the south-east quarter of Section 20 in Township 21 Range 4 West of the 5th Meridian. The development being proposed is for a private recreational ranch, offering a unique ranching experience to owners of the recreational properties, with positive outdoor educational and environmental values. Emphasizing proximity to Kananaskis Country and the extensive outdoor recreation available, the project will feature the ranching heritage and the exceptional scenery of the area.

This Redesignation will allow for a private ownership structure which is in keeping with market demands. While the nature of the development will remain the same as already approved, the Redesignation will allow individual, private purchasers of mini-ranches to hold title through a bare-land condominium arrangement. Under the existing Agricultural Conservation District, individual ownership of cabins is not allowed.

1.1 Background

The history of this project dates back to 1989 under the name Maximum View Ranch, when one of the present owners applied for and was granted a development permit for a "Country Recreational Lodge" under the provisions of the Agricultural Conservation District of the Municipal Districts Land Use Bylaw. The project was intended to provide "*mini-ranches*" having the privacy of cabins, along with on-site support services, in a ranching and recreational environment. Initially, the development was to incorporate private investors and focus on rentals to the public.

The owner also operated Maximum West Ranch Club at that time, and because of the success of that operation, a more extensive development was briefly considered. Focusing on a larger lodge with the incorporation of more facilities and services, this concept was targeted to corporate retreats and business meetings. Because of the recession in the early 1990's, the project was subsequently delayed.

The sale of Maximum West Ranch and its conversion to an exclusive corporate retreat facility resulted in the need for a change in the name of the proposed development to Square Butte Ranches Ltd. Also, because of an operational separation and different focus between the two projects, the concept for Square Butte Ranches has been returned to the *mini-ranch* theme with an emphasis on privacy, a low-key approach, and a modest ranch centre.

Section 2

Planning Context

2.0 Previous Approvals

In the spring of 1989, an application was made by Maximum View Ranch Ltd. for approval of a Country Recreational Lodge as a discretionary land use under the Agricultural Conservation District of the Municipal District of Foothills Number 31 Land Use Bylaw. Along with this land use request, a development permit for the first phase of the project was requested. These requests were granted in Development Permit Number 6371 and upheld with conditions by Board Order 32/89 of the Municipal District Development Appeal Board.

The approval was based on the report "Maximum View Ranch Country Recreational Lodge Development Proposal" prepared by Urban Systems Ltd., and dated June 6, 1989. The development was to consist of a ranch centre incorporating a lodge with sixteen (16) accommodation units, dining facilities, meeting rooms, and associated services; thirty-two (32) cabins dispersed to secluded or scenic locations as *mini-ranches*; an equestrian centre including a livery stable, corrals, outdoor arena, and storage; on-site utilities; and supplementary fencing and corrals.

Incorporated in the 1989 approval was an additional quarter section of land, the SW 20-21-4-W5M. That parcel, belonging to Mr. Joe Lukacs, has been removed from this plan and from the Redesignation. No development was proposed for this parcel in the initial approval; rather the land was included only for additional outdoor space and pasture land, a need which is not warranted given the scope of the present project.

2.1 Other Planning Documents

Subsequent to the initial approvals, consideration was given to marketing the project to higher end business clients. To consider this, an additional report, entitled "Maximum View Ranch Country Recreational Lodge Master Plan", dated February, 1990, was presented to the Municipal District for information on April 9, 1990. This Master Plan was prepared in order to refine the development concept, to properly site the facilities, and to provide the necessary supporting information required by the conditions in the development permit. This Master Plan was also presented to the appropriate provincial agencies. The document incorporated a detailed development plan, a thorough analysis of site and environmental conditions, and a capital budget. Because of the close association with Maximum West Ranch Club at that time, it was proposed that the main lodge be emphasized and a higher level of investment be considered. Of particular relevance, the central lodge units were to be increased to twenty-four (24) and cabins decreased to twenty-four (24).

Commissioned to provide background information for the Master Plan were two additional reports:

- Preliminary Geotechnical and Ground water Analysis, Maximum View Ranch Thurber Consultants Ltd., January 1990;

- ❷ Historical Resources Impact Assessment, Maximum View Ranch Country Recreation Facilities, Near Millarville, permit 89-115, Aresco Ltd., March 1990.

While the development concept has now reverted back to the *mini-ranch* concept, these reports provide good site analysis and background information for the present undertaking.

2.2 Development Progress

Since the approval of the Development Permit, water well drilling, fencing, road design, detailed cabin siting, and pond design has been completed.

The introduction of two additional partners has strengthened the ownership of Square Butte Ranches Ltd. and the project is now ready to proceed. The proponents have requested the Redesignation of the property to the new Resort Recreation District as this will more accurately reflect the intent and provide the proper guidelines for its development. It must be emphasized, however, that the concept has not changed nor has the intensity of development been increased. However, the Resort Recreation District will provide the opportunity to develop under a *bare-land condominium* arrangement, which provides a more responsible form of ownership and is more in keeping with the anticipated market and the aspirations of the local community.

In 1992, during meetings between the Municipal District staff and the owners and consultants of Square Butte Ranches, it was committed that the upgrading of the municipal road leading to the site would be required at the point at which more than two dwelling units per quarter section was reached. That remains the commitment of the owners. Road upgrading plans have been prepared, these have been submitted to the Municipal District and construction quotes have been received. The road upgrading agreement will be executed with the submission of this plan.

2.3 Policy Framework

The overall policies and legislation under which this plan has been prepared include the Alberta Planning Act and the Calgary Regional Plan. More specific planning direction is given by the Municipal District of Foothills General Municipal Plan, which was adopted in 1986. Control over land use and development is exercised through the Municipal District's Land Use Bylaw.

The General Municipal Plan states an overall philosophy of:

> "To provide for settlement, subdivision and use of land in an orderly, economical and beneficial way without infringing on the rights of individuals except to the extent necessary for the greater public interest of the M.D.'s residents."

The plan also presents a series of goals, including encouragement of the conservation and wise use of agricultural land, encouragement for the expansion and diversification of the economic base and providing recreational development. This northwestern sector of the Municipal District has been established as a "development area" suitable for a variety of residential and recreational uses.

The General Municipal Plan deals specifically with recreation developments, noting that they are desirable, providing they do not unduly interfere with ranching nor present noise, ground water or trespass problems. Two specific policies are stated in the plan :

> "Recreational developments that are compatible with the rural surroundings and take advantage of natural physical features and large areas of land are viewed as being appropriate types of developments for the M.D. of Foothills. These activities are often agriculturally related or sport activity oriented. Developments such as (but not limited to) ski resorts, golf courses, riding stables, campgrounds, lodges, dude ranches, rodeo grounds and picnic grounds would be considered to be appropriate for the M.D. The location of these types of developments will be subject to their compatibility with the main function of each Policy Area identified in this Plan....
>
> Owners / developers of proposed recreational developments will be required to install adequate sewage disposal systems and water supply systems satisfactory to the M.D. and the appropriate authorities."

As Square Butte Ranches is within the area of the Municipal District designated for development, it presents uses which are compatible with those recommended and it is adjacent to the vastness of Kananaskis Country, this proposal is in keeping with the goals of these documents.

2.4 Plan Goals

The primary intent for the Square Butte Ranches Area Concept Plan is to provide a policy framework leading to the development of an environmentally-sound, attractive and viable project which offers its private owners high quality recreational experiences in a scenic landscape. The plan has been prepared in keeping with the policies and standards of the Municipal District and under the statutory conditions within which the Municipal District functions.

The overall goals of this plan are :

- To guide the development of Square Butte Ranches and ensure that it provides appropriate activities and functions in keeping with the above-noted policy framework.

- To ensure that it is compatible with the environment.

- To establish the project as a sound and responsible development within the Municipal District.

- To establish that the responsibility for the costs of the project will rest with the developers and the responsibility for on-going operations and maintenance will rest with the developers and condominium association.

Section 3

Locational Context

3.0 Site Location and Features

The Square Butte Ranches site is located some thirty miles (fifty kilometres) from Calgary. As shown on the Location Plan, the property is adjacent to Kananaskis Country, Alberta's recreational playground which offers more than 1600 square miles (4000 square kilometres) of Rocky Mountains, forests, lakes, and streams. On the northeastern corner of the site is the Maximum West Corporate Retreat Centre.

The Square Butte Ranches site consists of 472 acres (191 hectares) of exceptionally scenic Rocky Mountain foothills terrain. The site features an open, meadow-like central valley flanked by three razorback ridges to the north and one ridge to the south. These ridges, with mixed coniferous and deciduous tree cover, frame the open meadow and focus one's eye on Mesa Butte, a major land form one mile (1.5 kilometres) to the west.

3.1 Access

Access to the Square Butte Ranches from Calgary is by way of Highway 22 to Millarville, then west on Secondary Highway 549, and north on Secondary Highway 762 to within some three miles of the site. The rest of the route is on local roads. It is a portion of this local road that will be upgraded by the developers of Square Butte Ranches. About three quarters of a mile beyond the site to the north, the public roadway ends and access to the private properties and Kananaskis Country is via a limited access trail.

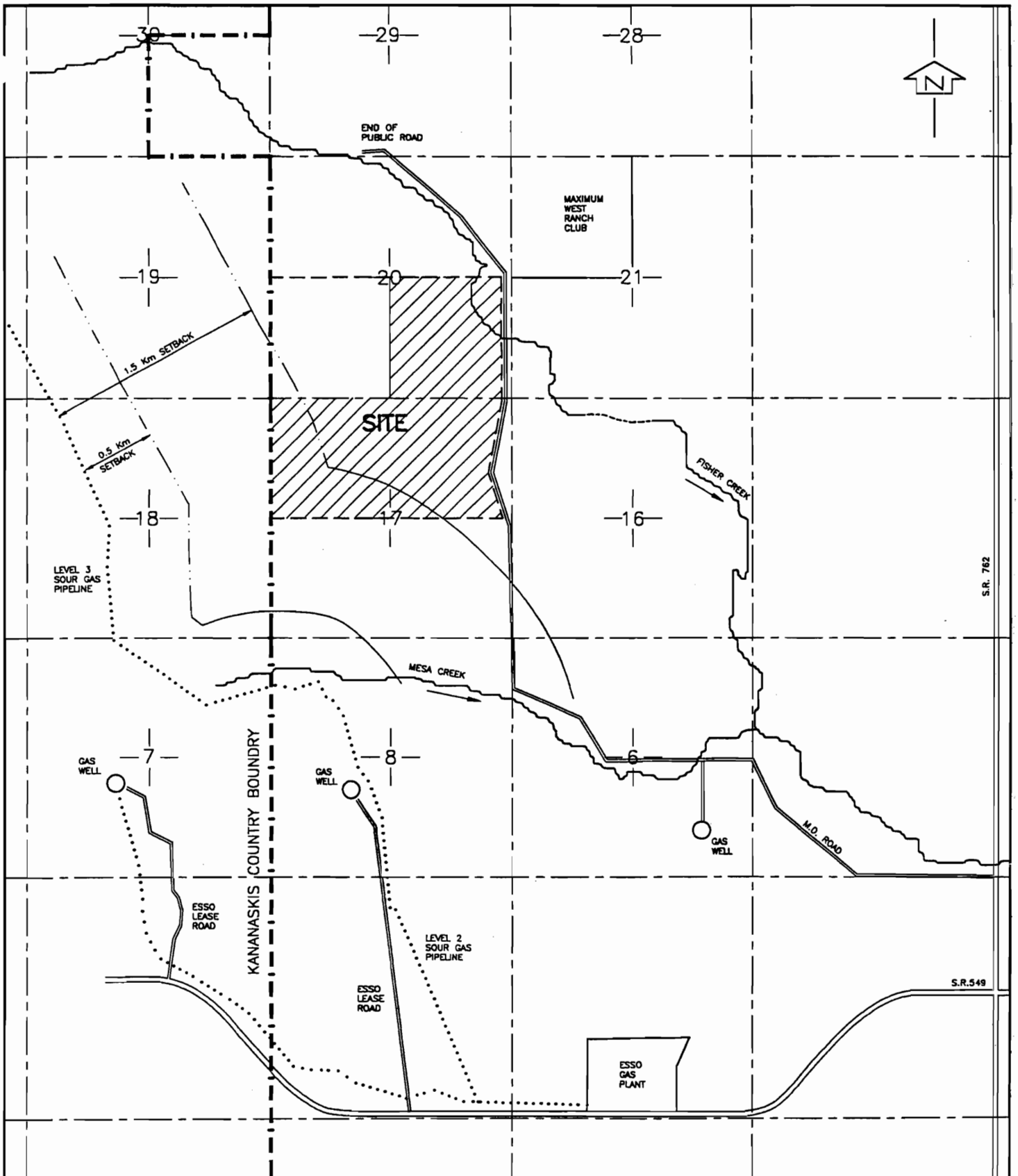
3.2 Set-Back From Gas Pipeline

As shown on the Location Plan, a sour gas pipeline is located within Kananaskis Country approximately three quarters of a mile west of the site. This facility, rated at Level 3 by the Energy Resources Conservation Board, poses certain set-back requirements respecting various types of development. While not specific to the type of development proposed herein, the Subdivision Regulations under the Alberta Planning Act define the following setbacks:

- 0.5 kilometre for an unrestricted country development containing more than eight permanent residences per quarter section;

- 1.5 kilometres for a *rural public facility*, being an area of land or building used for intensive recreation, or an urban area.

The developments proposed within Square Butte Ranches include cabins, which would be of a similar nature to the unrestricted country development, and the ranch centre facilities, which would be similar to the rural public facility. The proposed cabins and the ranch centre and equestrian facilities are sited better than two kilometres away from the pipeline. Thus, this proposal is in full conformation with these requirements.



B.M. Potter Consultants Ltd.

LOCATION PLAN

DRAWN G.S. BRIGGS	DATE 12.03.94
APPROVED B.M. POTTER	SCALE N.T.S
DESIGNED B.M. POTTER	JOB No. 288-004

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1	12.03.94	PRELIMINARY	BP

Section 4

The Site

4.0 Legal Description

Square Butte Ranches includes three quarter sections:

- ❶ NE 17 - 21 - 4 - W5M 152 acres
- ❷ NW 17 - 21 - 4 - W5M 160 acres
- ❸ SE 20 - 21 - 4 - W5M 160 acres

The properties are subject to agreements for incorporation into the development described herein. The current owners are noted in the appendix.

4.1 Site and Adjacent Land Uses

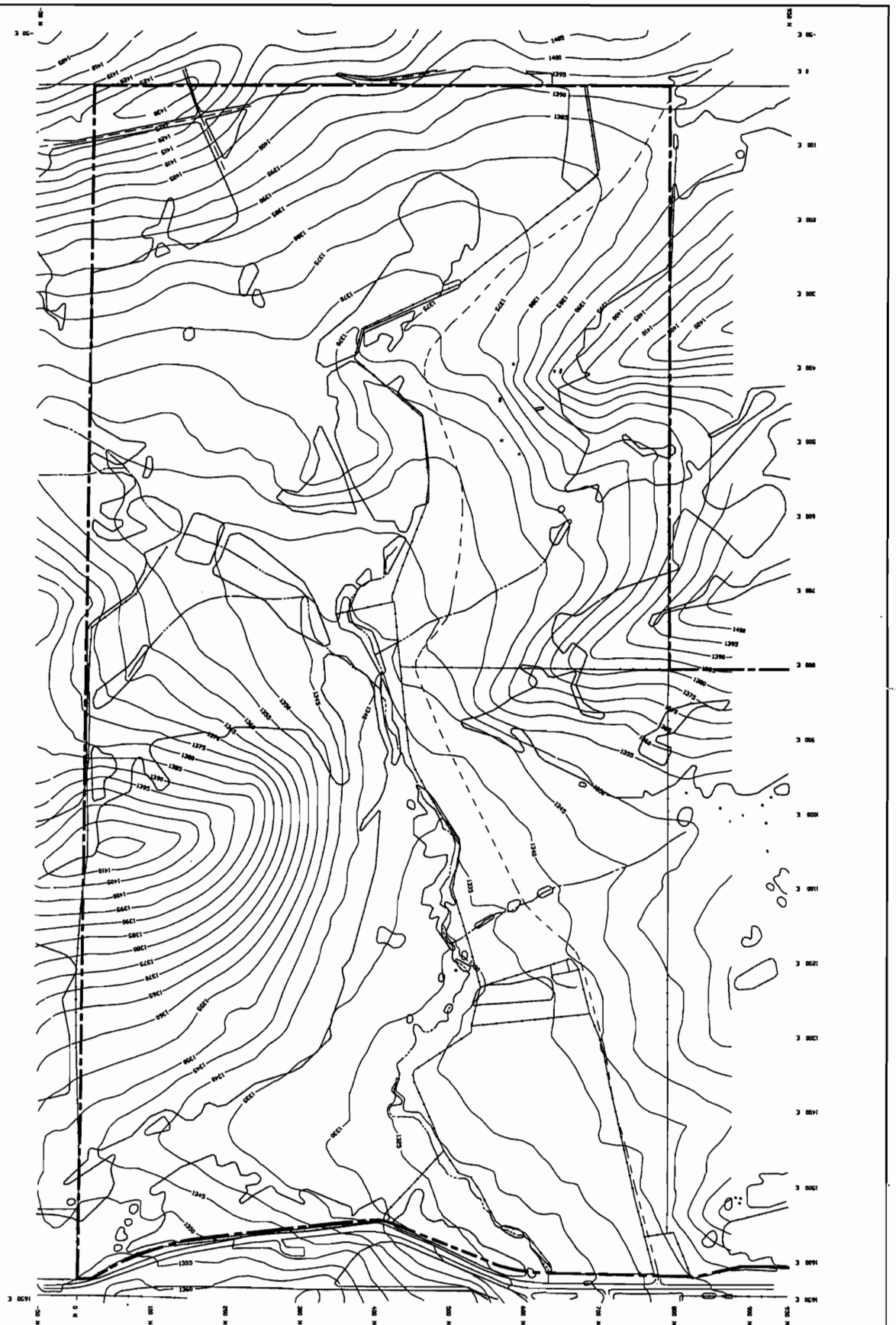
The site is presently used for ranching, with the majority of the northern quarter as unimproved pasture and much of the southern quarters in forage production or cleared for improved pasture. A number of cross fences and corrals are present in the southern quarters. The southern portions of the site establish an open meadow atmosphere, while the northern ridges provide a treed environment.

Apart from the corrals and fences, the only developments on the site are a cabin in the southeastern corner of NE 17 and a dam on the stream course in the eastern portion of the central valley. The cabin is the first structure for the project and will initially be used for marketing purposes. Ultimately it will be sold as a private mini-ranch.

A significant feature of the subject site is its proximity to Kananaskis Country. As shown on the Location Plan, trail links into Kananaskis Country are present; one leading northwest into the McLean Creek Off-Highway Vehicle Zone and one to the southwest into the Three Point Creek Outdoor Recreation Zone. This boundary between the motorized recreation zone and the horseback/hiking/cross-country ski zone is ideal as it provides opportunity for both forms of recreation immediately accessible from the site.

The Kananaskis Country Integrated Resource Plan identifies the area to the west from the proposed site for multiple use, which allows forest harvesting, grazing, hunting, and oil and gas development along with the recreational uses. Because of the present demand for lumber it is possible that the forest harvesting may occur in the area over the next five years.

While substantial gas development has been undertaken over the past two decades in the general area it would appear to be mostly completed except, perhaps some distance west or north from the subject site. Wells were drilled and abandoned in NW 17 and in SW 21, within the site. The nearest wells, shown on the Location Plan, are more than a mile to the south.



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SP-1

TOPOGRAPHY – SOUTH

DRAWN	DATE
C.S. BRIGGS	12.03.94
APPROVED	SCALE
B.M. POTTER	0
DESIGNED	JOB No.
B.M. POTTER	288-004

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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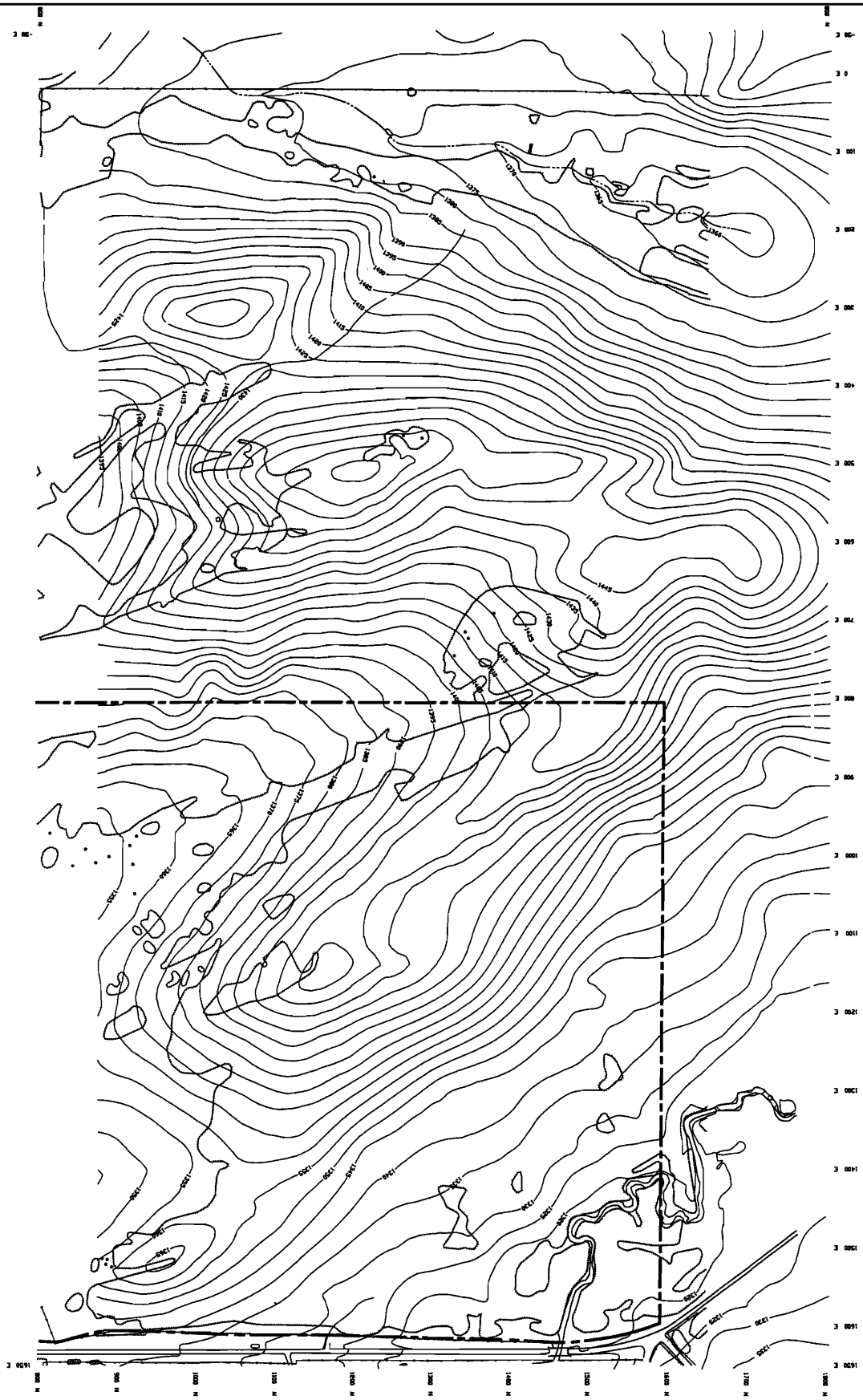

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APPROVED: B.M. POTTER	SCALE:
DESIGNED: B.M. POTTER	JOB No.: 288-004

DWG. No. NP-1

TOPOGRAPHY – NORTH

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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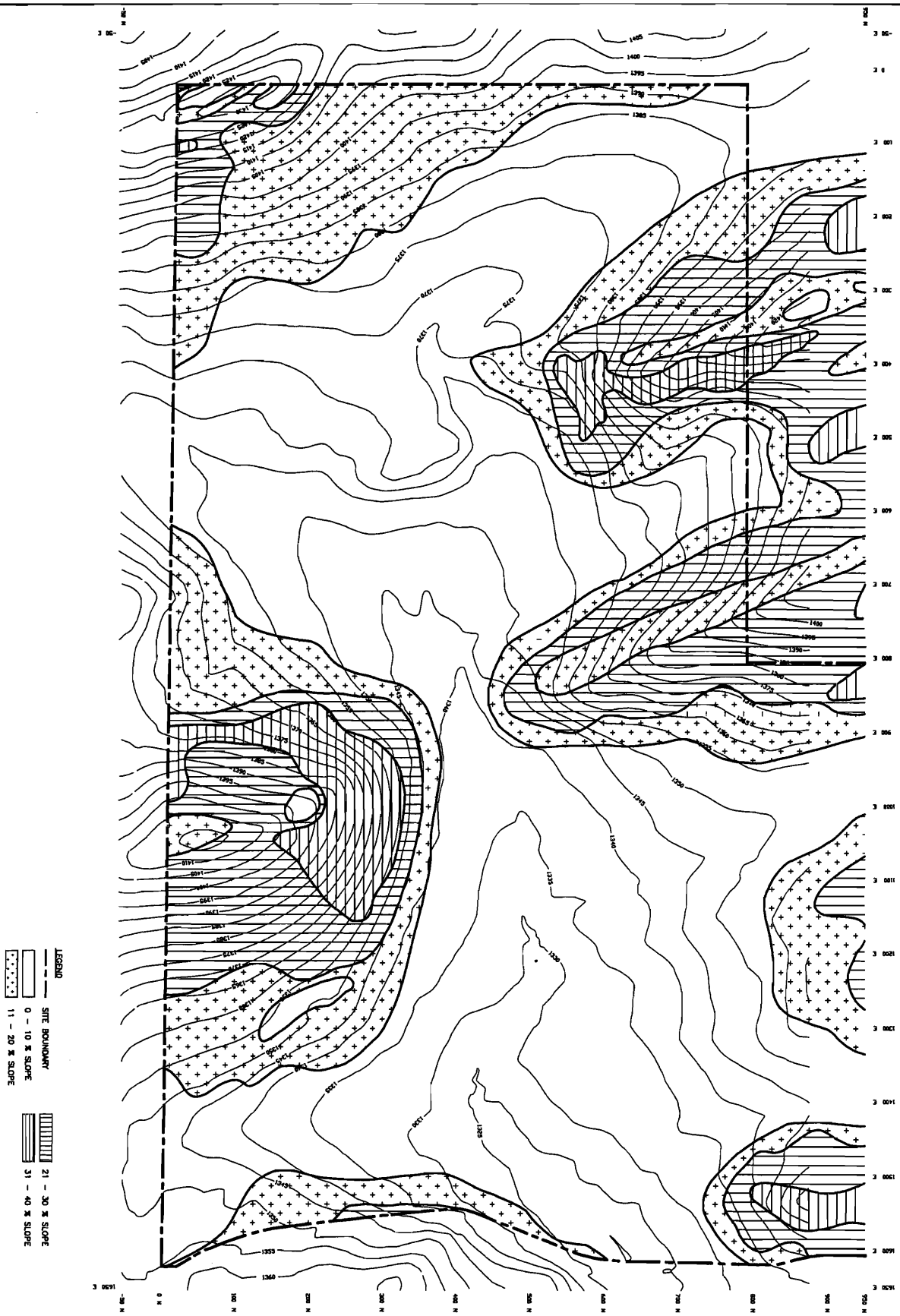

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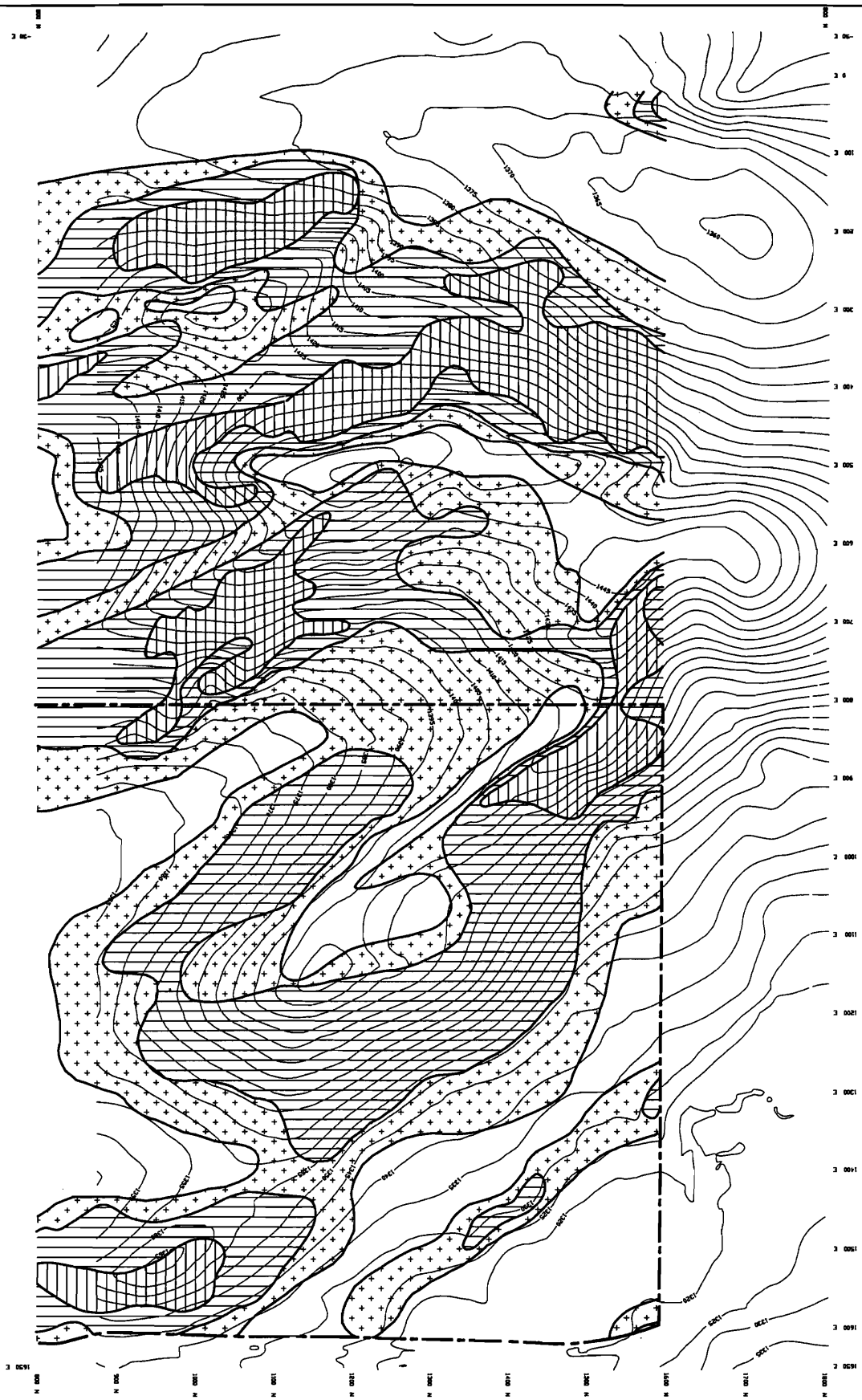
DESIGNED B.M. POTTER	JOB No. 268-004	

SHEET No. SP-2

SLOPE ANALYSIS - SOUTH

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1	12.03.94	PRELIMINARY	BP



B.M. Potter Consultants Ltd.

SLOPE ANALYSIS – NORTH

DRAWN C.S. BRIGGS	DATE 12.03.94		
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MINI-RANCH DEVELOPMENT
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MILLARVILLE ALBERTA

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4.2 Topography

The physical topography of the site, as shown on the Topography and Slope Analysis plans, consists of typical *razorback ridge* terrain common along the foothills of the Rocky Mountains. The dominant features include the gently-sloped central valley with three parallel ridges trending northwest to southeast to the north of the valley and one ridge shoulder to the south. The west sides of these ridges are typically more gentle in slope (20% to 30%) while the east sides are often steeper (30% to 50%). The maximum relief for these ridges is some 300 feet (90 metres), while the average relief is some 230 feet (70 metres).

Leading north from the central valley are tributary valleys between the three ridges. Two of these rise more steeply than the central valley (10% to 25%), and form slight *saddles* between the ridges before dropping off again to the northwest. The more westerly valley forms a continuation of the central valley and runs north out of the site. From its crown, it then drops to the north and northeast to Fisher Creek.

At the northeast corner of the site, to the north and east of the more easterly ridge is the valley of Fisher Creek. Leading from the front ranges of the Rocky Mountains, Fisher Creek is joined by the intermittent stream course draining the central valley of the site about one half mile east of the local road. These stream courses provide excellent drainage for the property.

4.3 Vegetation

The site features an open grassland and hay meadow bordered by a typical lower foothills boreal forest. Overall, the vegetation is of good, healthy quality. Five identifiable vegetation zones exist as described below. These zones are detailed on the Vegetation plan.

❶ Grasslands - are a dominant feature within the valley sections of the site. Natural grasslands consist of wheatgrass, bluegrass, and rough fescue. Introduced forage vegetation includes bromegrass, timothy, and alfalfa. On this site, the grasslands tend to occur on the south facing slopes and valleys. The gentle sloping areas have been cultivated as pasture lands. The grasslands are typically found on Eutric Brunisolic soils which lack pronounced horizon development and pH values will generally be over 5.5.

❷ Valley Wetlands or Marshlands - occur within the main valley corridor near the intermittent creeks that flow during spring runoff. Dogwood, alders, willows, equisetum, sedges, and dock are the main vegetation of the zone. The soil is similar to the grassland but sections are typically more acidic and exhibit pH values under 5.5. They are also significantly higher in organic content.

❸ Aspen Transitional Phase - occurs on the southern faces of the ridges where it borders the grassland areas. The transitional phase combines aspen with a shrub understory of rose and buckbrush with a herb layer containing junegrass, rough fescue, orchard grass, yarrow, avens, geranium, and bedstraw. The gradual encroachment of aspen into the grassland will occur if natural processes are not impeded and in the absence of fire. The soil profile development is poor and Orthic Eutric Brunisol is characteristic.

❹ Mixed Wood Forest - occurs on the lower southern facing slopes within the site. The till deposits on the lower slopes support aspen, white spruce, and lodgepole pine, with an understorey of grasses and such herbs as fireweed, asters, and rue. The soil profile is a Melanic Brunisol with horizons over four inches (10 cm) deep and a pH over 5.5.

❺ Mixed Conifer Forest - on the north and east exposures, the dominant vegetation zone is a mixed conifer forest consisting of lodgepole pine and white spruce, with associated juniper, wintergreen, bunchberry, bearberry, Labrador tea, lichens, and mosses. Typically cooler and more moist, these zones exhibit more acidic soils of medium texture. Soil depths vary but tend to become thinner on the ridge slopes giving way to rock exposures in some areas of the site. The drier portions of the site will have pine predominating while the cooler and moist locations will have more spruce.

In addition to these specific vegetation zones, a wide variety of wildflowers frequent the site. Species will vary according to site conditions but include a number of herbaceous and woody plants. A variety of blooms and colors may be present at any time from spring to fall.

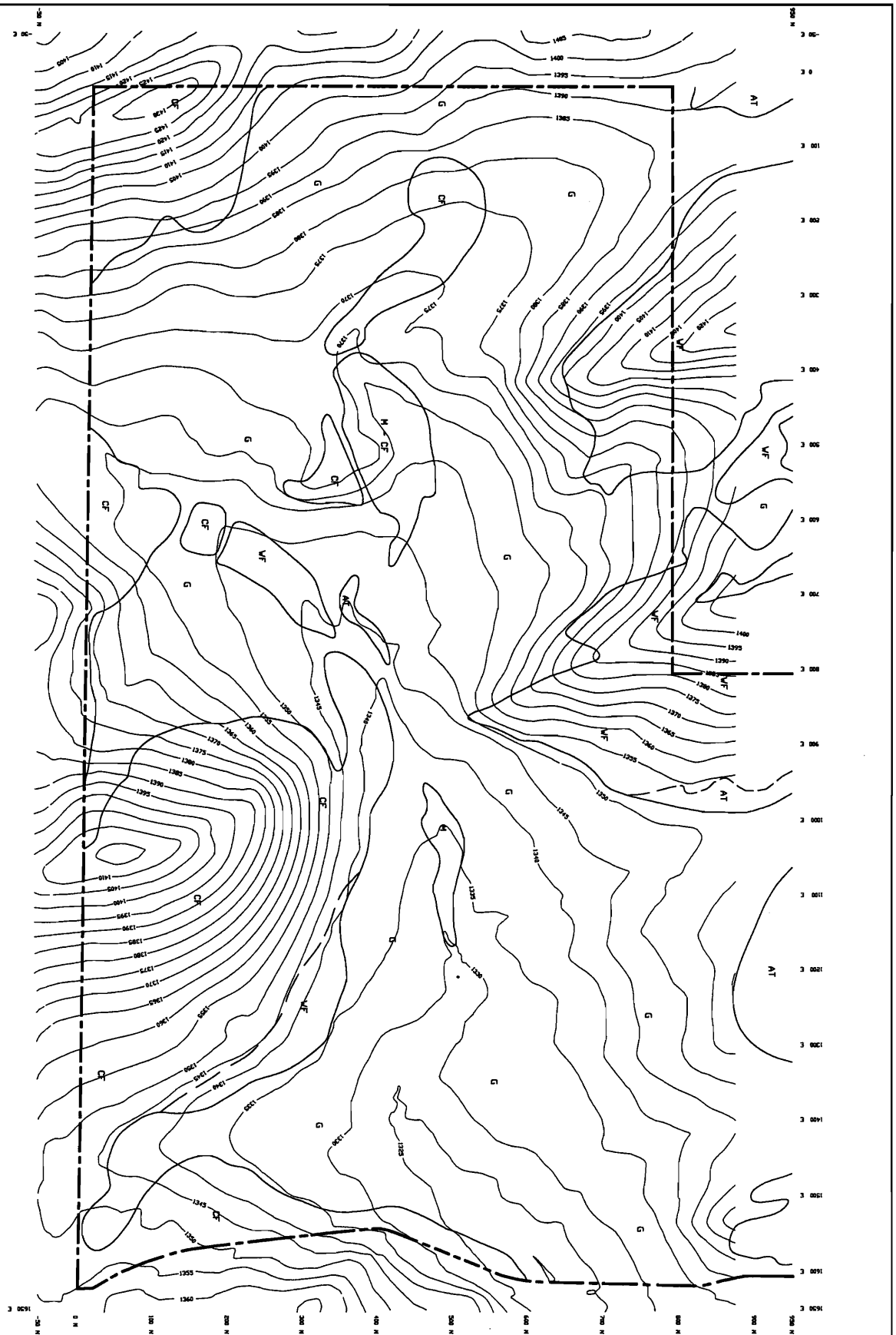
Scenic variety, open views, winter and summer appeal, shelter and wildlife habitat are provided by the vegetation regime. During development, added attention will be paid to preventing unwarranted destruction of vegetation. In particular, roadway clearing should be kept to a minimum and revegetation of cut and fill slopes with native trees, shrubs, and grasses should be quick. All trees to be removed will be used for construction or firewood.

By concentrating the development on the eastern portions of the site and confining its overall footprint, the impact on the vegetative community will be substantially reduced compared to other land uses or more dispersed activity. With appropriate mitigation techniques and the institution of effective user practices, impacts on vegetation can be kept to a minimum and may, in some cases, result in a net increase in the capability for certain species.

4.4 Wildlife

Combinations of mixed forest, marshy wetlands, and open pastures, along with the relatively undisturbed natural environment of Kananaskis Country to the west, create a variety of productive wildlife habitats which are typical of the Eastern Slopes region of the Rocky Mountain foothills. Similar to the impacts on vegetation, the concentration of development along the eastern boundary of the property will significantly reduce the effects on wildlife, compared to more dispersed activity.

Elk, moose, mule-deer, black-bear, lynx, cougar, beaver, and coyotes, as well as a variety of smaller mammals and birds are typically found in the area and have been observed on-site. Also, wild horses and a wild turkey have been reported in the vicinity. Trout are found in Fisher Creek, primarily during higher flow periods and during spawning. Some will remain year-round in deeper pools or beaver ponds. However, it is not a stream accommodating substantial fish populations throughout the year.



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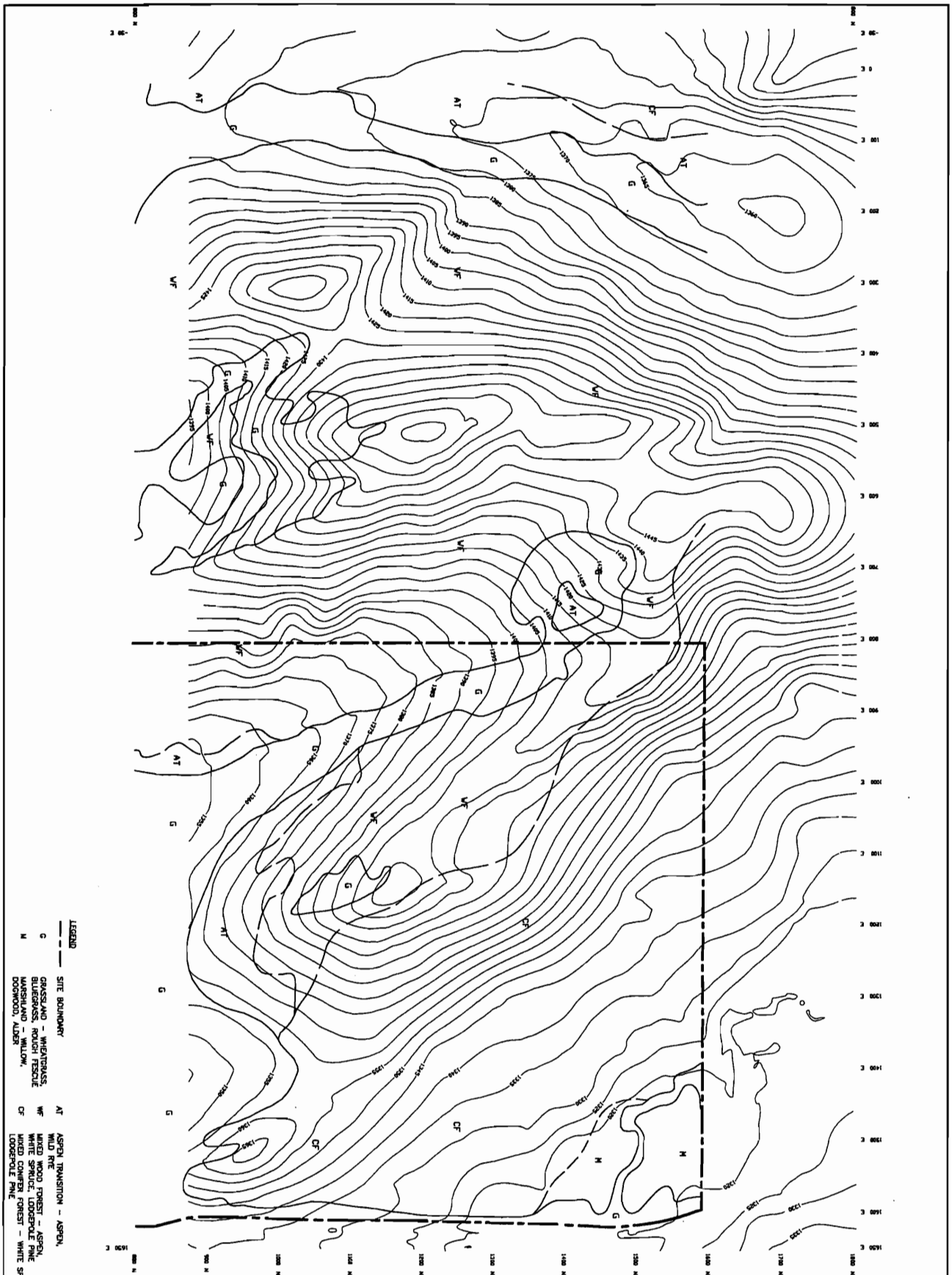
APPROVED: B.M. POTTER | SCALE:
DESIGNED: B.M. POTTER | JOB No.: 268–004

DWG. No. SP–3

VEGETATION – SOUTH

MINI–RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1.	12.03.94	PRELIMINARY	BP



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APPROVED B.M. POTTER	SCALE		
DESIGNED B.M. POTTER	JOB No. 288-004		

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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DRG. No. NP-3

VEGETATION - NORTH

The potential to view a variety of wildlife will be a major attraction for Square Butte Ranches and an information package will be developed to enhance wildlife values and protect habitat. Attention should be directed by the developers to a number of factors in the project. Upon its completion, the condominium association will be responsible for these matters.

- Control over pets will be essential to ensuring that desirable species remain in the area. All pets of patrons should be kept leashed or indoors, including cats and especially dogs.

- Potential problem wildlife, such as bears or skunks, require adequate attention during design and operation of the facility. In particular, proper handling of garbage, including on-site storage and regular collection and removal, must be properly planned.

- Desirable wildlife species, including birds, squirrels, and other small mammals, deer and elk, can be maintained on-site or nearby if the development respects the needs of each species. Attention should be addressed to maintaining or supplementing feed sources, providing adequate shelter, maintaining escape routes and ensuring proper protection during critical periods of the year, such as during times of deep snow, heavy pregnancy, and birthing. Bird feeders, birdhouses, and nest platforms should be constructed, and fences should be designed and located with regard to wildlife.

- Recreational movement on-site and in the area should be adequately controlled to prevent undue disturbance of wildlife, especially during winter months and birthing periods. Routing of trails should avoid bedding and birthing grounds and patrons should be supervised or instructed to minimize disturbances.

- Care must be taken to prevent livestock grazing from destroying important wildlife habitat, especially winter forage. Improvements along clearings and meadows may be possible by replanting with native shrubs and grasses. Fencing of critical wildlife areas to keep cattle away may be necessary.

- A 50 metre buffer from the stream courses should be maintained where possible. Also, livestock watering should be away from the streams and marshes. Any damaged sites should be restored.

- On-site water impoundments can be developed for fish, waterfowl, invertebrate, and aquatic plant habitat. Likely these should be stocked annually and harvested each fall. Proper water depth, bank protection, and water quality will be required and special attention to spillway details will be needed to prevent escape of stocked fish into downstream waters. Rare or endangered amphibians and reptiles may also be introduced. An additional pond further west will provide better access for wildlife but this can be of a small size.

The guidelines noted above will reduce the impact that a development of this nature would otherwise produce and will likely enhance habitat for many birds. As noted by Tera Environmental Consultants in a review conducted for this plan (see Appendix B), some reduction of habitat for larger ungulates, such as elk and moose, and for carnivores, such as cougars and bears may have a slight influence on the overall production of these species in the region. However, the proposed development will retain significant wildlife values, especially compared to other uses that could be undertaken on the site.

4.5 Hydrology

All of the site drains into the intermittent stream within the central valley, except for the northeast corner, an area of about 80 acres (32 hectares). This intermittent stream has a drainage basin of nearly two square miles (5 square kilometres) as it leaves the site. The stream is fed by ground water discharge and surface runoff and flows on surface during the snowmelt and spring periods. However, it does not have a surface flow in its lower sections through the fall and winter. In spite of this, upstream flow of one to two imperial gallons per minute (5 to 10 litres per minute) was observed by Thurber Consultants during the fall and winter of 1989/90. It is likely that year-round discharge takes place but it seeps through the surface organic materials in the lower reaches of the stream. A stock watering impoundment for this stream was approved in 1989 for a dam height of some ten feet (3.5 metres) flooding about one acre (0.4 hectares). This dam has now been constructed.

The northeast portion of the site drains into Fisher Creek, a permanent stream with a significant year-round flow which traverses the property for approximately 2000 feet (600 metres). No development is proposed near this watercourse at this time.

4.6 Views and Features

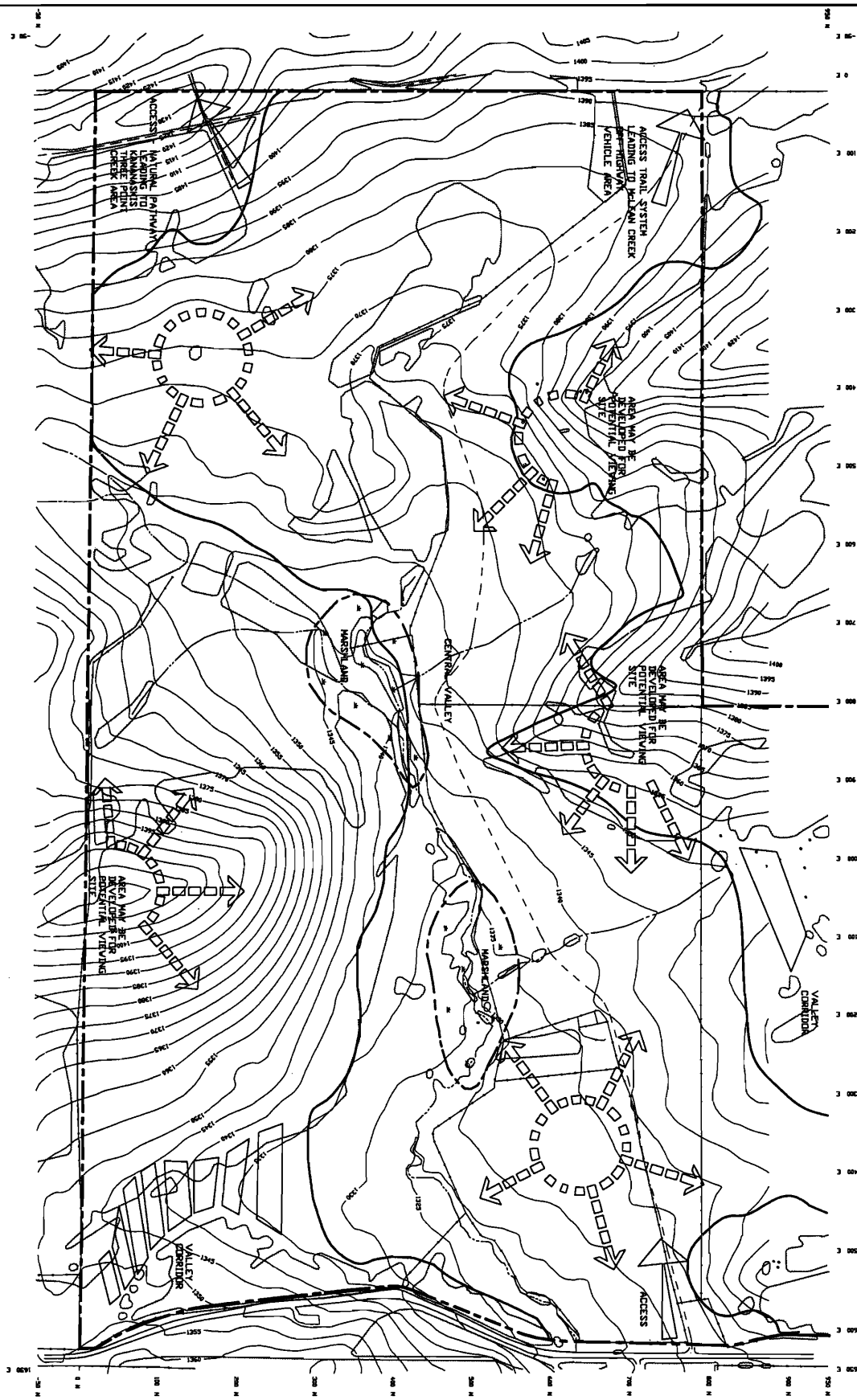
The Square Butte Ranches site offers a wide variety of views including: spectacular mountain vistas; views of foothill landscapes varying from Coalmine Hill in the east to the prominent Mesa Butte in the west; views revolving around the tree-covered ridges, grassy hills, and open valleys on-site; views of a diverse vegetated landscape; and views of wildlife. Specific view sheds and other features are identified on the Views and Features plan.

It will be important that the development of the ranch facilities be carried out so as to complement and protect, but not to compete with, these views. Siting of such buildings as the ranch centre and cabins should maximize the view potential and the design and finish of these should *fit* within the landscape. Specific viewpoints may be accessed by trails and seating may be provided.

The intermittent stream in the central valley provides the potential for a water feature which will provide visual relief in this valley and allow the stream to be enjoyed year-round.

The valley corridors, enclosed as they are between ridges and thick foliage, offer natural trail routes and means of accessing the higher elevations. These are also typical movement corridors for wildlife, thereby providing sighting opportunities.

Another feature of Square Butte Ranches is the convenient entry to Kananaskis Country and its hundreds of miles of trails leading to mountains, streams, lakes, and forests. As shown on the Views and Features plan, the south access is for non-motorized recreation while the north route leads to the McLean Creek motorized recreation zone.



B.M. Potter Consultants Ltd.	DRAWN G.S. BRIGGS	DATE 12.03.94			MINI-RANCH DEVELOPMENT for SQUARE BUTTE RANCHES MILLARVILLE ALBERTA		
	APPROVED B.M. POTTER	SCALE					
DWG No. SP-4 VIEWS & FEATURES – SOUTH	DESIGNED B.M. POTTER	JOB No. 288-004				1 12.03.94 PRELIMINARY BP	
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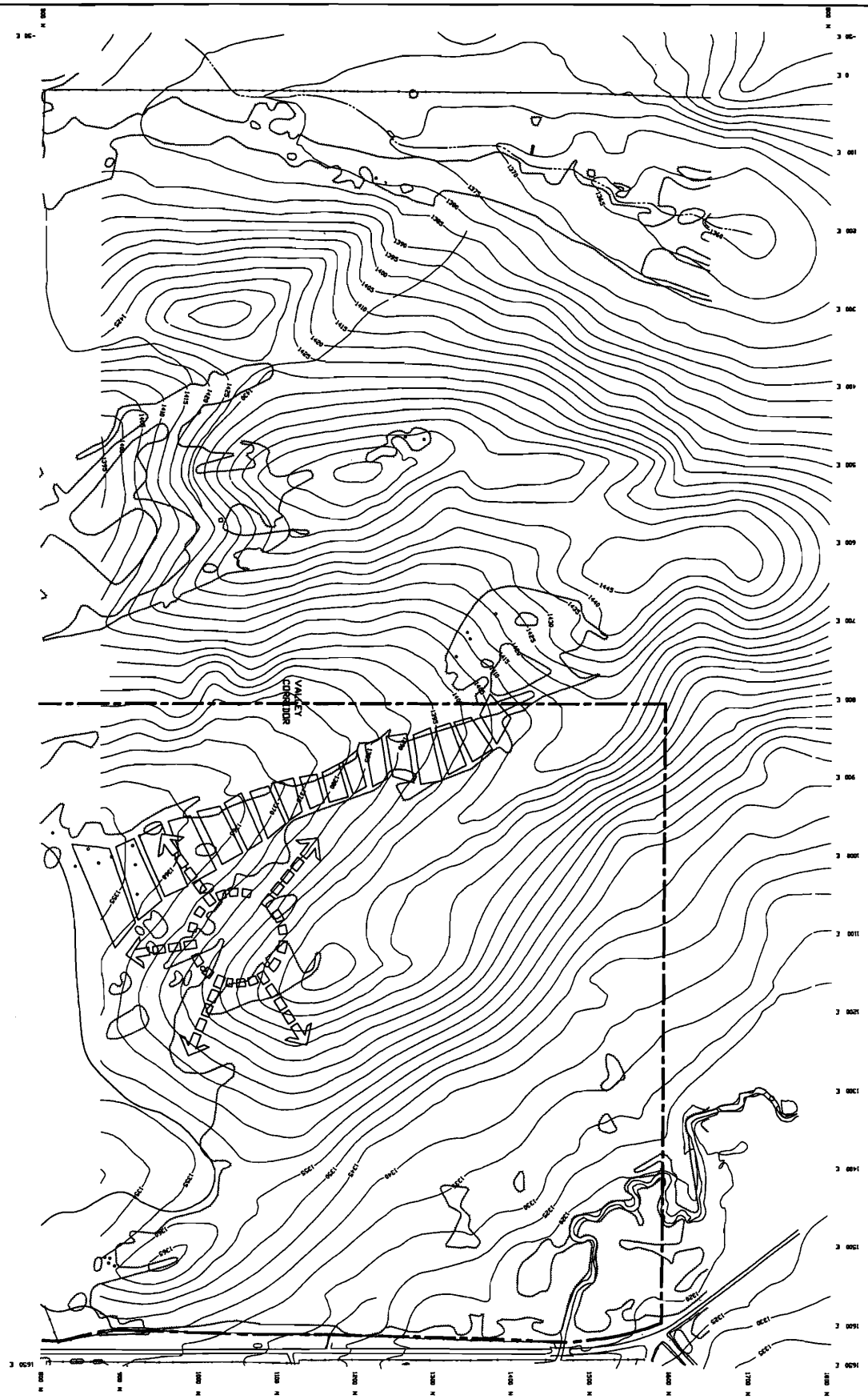

B.M. Potter Consultants Ltd.

VIEWS & FEATURES – NORTH

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APPROVED: B.M. POTTER	SCALE:
DESIGNED: B.M. POTTER	JOB No.: 288-004

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1	12.03.94	PRELIMINARY	BP

4.7 Geotechnical and Groundwater Analysis

A detailed geotechnical and groundwater investigation was undertaken in the fall of 1989 and continued into early 1990. This has been supplemented by a further analysis of the specific proposal for Square Butte Ranches and identification of further geotechnical requirements during the detailed design and construction stage.

In general, the surface soils and subsurface conditions may be described as fair to good for construction from a geotechnical point of view. The soils are stable at slopes in excess of 30% and, providing good engineering practice is followed, these can be expected to remain stable after development. With the exception of the areas immediately adjacent to the creek, the site soils and bedrock exhibit good strength characteristics at all building locations and are suitable for support for both shallow strip and spread footings. Where the lacustrine and colluvial materials have sufficient depth, drilled, cast-in place concrete piles are expected to be the most economical foundation alternative.

The major geotechnical constraint to the development is the presence of high plastic clays on the site. These materials impose design constraints on foundations due to their inherent swelling characteristics, and on the proposed sewage treatment facilities, due to their relative impermeability. Also, where roadways cross the stream course in the central valley, soils with high moisture content and, in some locations, high organic content may be encountered. These will involve additional design considerations including sub-cutting, filterfabrics, reinforcement, et cetera.

4.8 Historical and Archaeological Features

In order to fulfill the requirements of the Alberta Historical Resources Act, an Historical Resources Impact Assessment was undertaken for the subject site by Aresco Ltd. during the fall of 1989 under a permit from Alberta Culture. A formal report was submitted to the Alberta Archaeological Survey and it is expected that clearance from the survey to proceed with development will be received following some additional investigation at the Virtue Homestead, nearby the ranch centre site. This work will be completed prior to construction as required by the Historical Resources Act. As this legislation provides its own enforcement, it is not necessary to establish further controls within this plan.

Section 5

The Development Proposal

5.0 Introduction

The ranch development will focus on common facilities in an activity centre which will contain "ranchette" units in the form of Santa Fe townhouses and may also include other facilities to serve the private recreational uses of the owners. Nearby will be the equestrian and livestock facilities. This ranch centre will be on the edge of the main valley within the site and radiating outward will be secluded clusters of cabin units - the mainstay of the accommodation.

5.1 Recreation Concept

Square Butte Ranches will be a recreational development owned privately and managed by a condominium association. The properties are only to be used for recreational purposes and not for permanent dwellings, as expressly stated in the Municipal District Land Use Bylaw. It is projected by the developers that the maximum period of stay by any owner over the course of a year will be 200 days, with July seeing the most concentrated activity. June and August will also be relatively busy, but the patrons will decrease substantially over the other months. Regulations covering the maximum stay per annum will be specified in the condominium association bylaws.

As a part of the purchase of a cabin or " Santa Fe " ranchette unit, $10,000 will be levied as a membership fee for the " Square Butte Ranch Club ", the entity which will be responsible for the recreational, educational, environmental and social activities and services for the development. This club will have a close working arrangement with the condominium association, but will have its own bylaws and regulations including provisions for keeping dogs leashed, cats kept indoors, anti-litter rules, protection of wildlife, protection of vegetation, etc. Included in these bylaws will be penalties for members who do not observe the provisions laid out by the club or the condominium association. For serious offenses by the owners or their guests, such as not conforming to the maximum stay provisions, the membership fee will be forfeited and membership in the club rescinded.

The management staff of Square Butte Ranches will be responsible to both the condominium association and the ranch club and will maintain a daily record of the use of the facilities and services and any non-compliance with the rules and regulations of these bodies. Monthly reports will be submitted to the Board of Directors of each organization for approval and the appropriate information will be forwarded to the Municipal District. Public reserve will be dedicated and the Municipal District will thereby become a party to the condominium association, allowing for attendance at association meetings.

Companion to this Area Concept Plan and the Land Use Bylaw Redesignation of the Square Butte Ranches site as Resort Recreation District will be the Bareland Condominium Plan and a Development Agreement between the Municipal District and Square Butte Ranches Ltd. Details for the execution of this plan and conditions of the condominium plan approval will be exercised through the Development Agreement.

The facilities for Square Butte Ranch will be developed and operated on a first-class basis. The following are some of the services and facilities which are expected to be provided :

- Recreation Activities:
  - ➡ horseback riding
  - ➡ wildlife viewing
  - ➡ photography
  - ➡ nature study
  - ➡ mountain biking
  - ➡ cross-country skiing
  - ➡ snowmobiling
  - ➡ hayrides
  - ➡ sleigh rides
  - ➡ tobogganing
  - ➡ barn dancing
  - ➡ rodeo/gymkhana events
  - ➡ special parties and weddings arranged for the owners
  - ➡ hiking
  - ➡ landscape viewing
  - ➡ landscape painting
  - ➡ fishing
  - ➡ canoeing
  - ➡ snowshoeing
  - ➡ exercise/fitness programs
  - ➡ carriage rides
  - ➡ skating
  - ➡ wilderness survival programs
  - ➡ brandings

- Accommodation:
  - ➡ private, first class ranchette suites at the ranch centre
  - ➡ high quality free-standing cabins

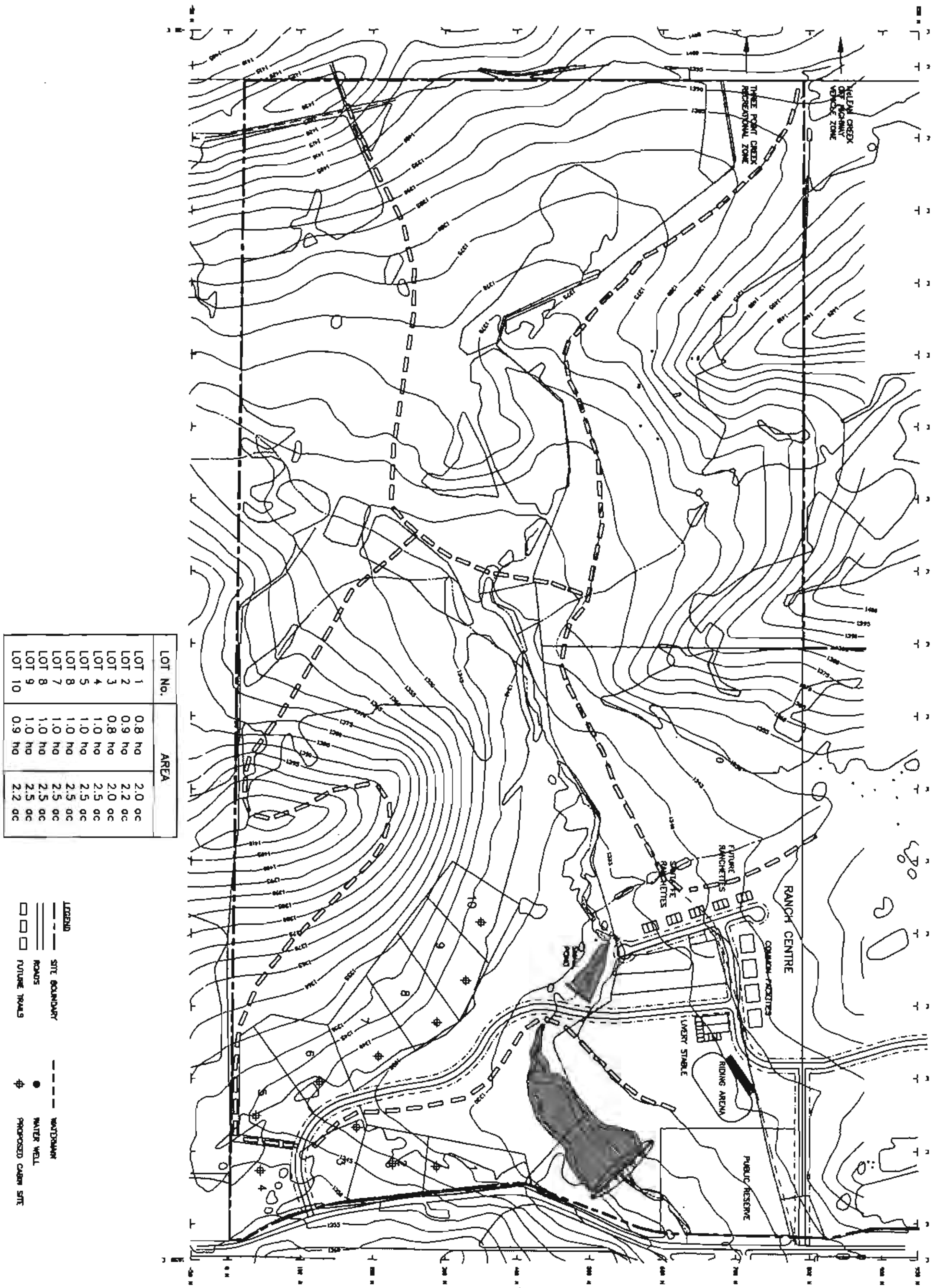
Directly linked to on-site opportunities will be the extensive recreation available in Kananaskis Country. In order to reduce the impact on the neighbors, patron movement for additional recreation will be directed into Kananaskis Country to the west, and not onto private or leased land. Also, patrons who are inexperienced will be guided for excursions into this area.

The kinds of recreation opportunities which will be featured include:

- Kananaskis Country Recreation Activities:
  - ➡ horseback riding
  - ➡ round-ups
  - ➡ hiking
  - ➡ ski touring
  - ➡ mountain biking
  - ➡ cross-country skiing
  - ➡ snowmobiling
  - ➡ back country pack trips
  - ➡ back country camping
  - ➡ mountain climbing
  - ➡ fishing
  - ➡ hunting
  - ➡ snowshoeing
  - ➡ survival training

5.2 Development Plan

Development of the first phase of Square Butte Ranches will proceed as outlined in the original development permit submission and all facilities and services will be located within the eastern portion of the site, NE 17 and SE 20. Development into the northwestern quarter of Section 17 will be limited initially to riding trails and ponds for livestock watering. The Development Plan drawings show the layout for the facilities in each quarter section.



LOT No.	AREA	
LOT 1	0.8 ha	2.0 ac
LOT 2	0.9 ha	2.2 ac
LOT 3	0.8 ha	2.0 ac
LOT 4	1.0 ha	2.5 ac
LOT 5	1.0 ha	2.5 ac
LOT 7	1.0 ha	2.5 ac
LOT 8	1.0 ha	2.5 ac
LOT 9	1.0 ha	2.5 ac
LOT 10	0.9 ha	2.2 ac

B.M. Potter Consultants Ltd.

DWG. No. H-1 DEVELOPMENT PLAN

DRAWN	DATE
C.S. BRIGGS	02.24.83
APPROVED	SCALE
B.M. POTTER	
DESIGNED	JOB No.
L.J. COUGHLIN	368-804

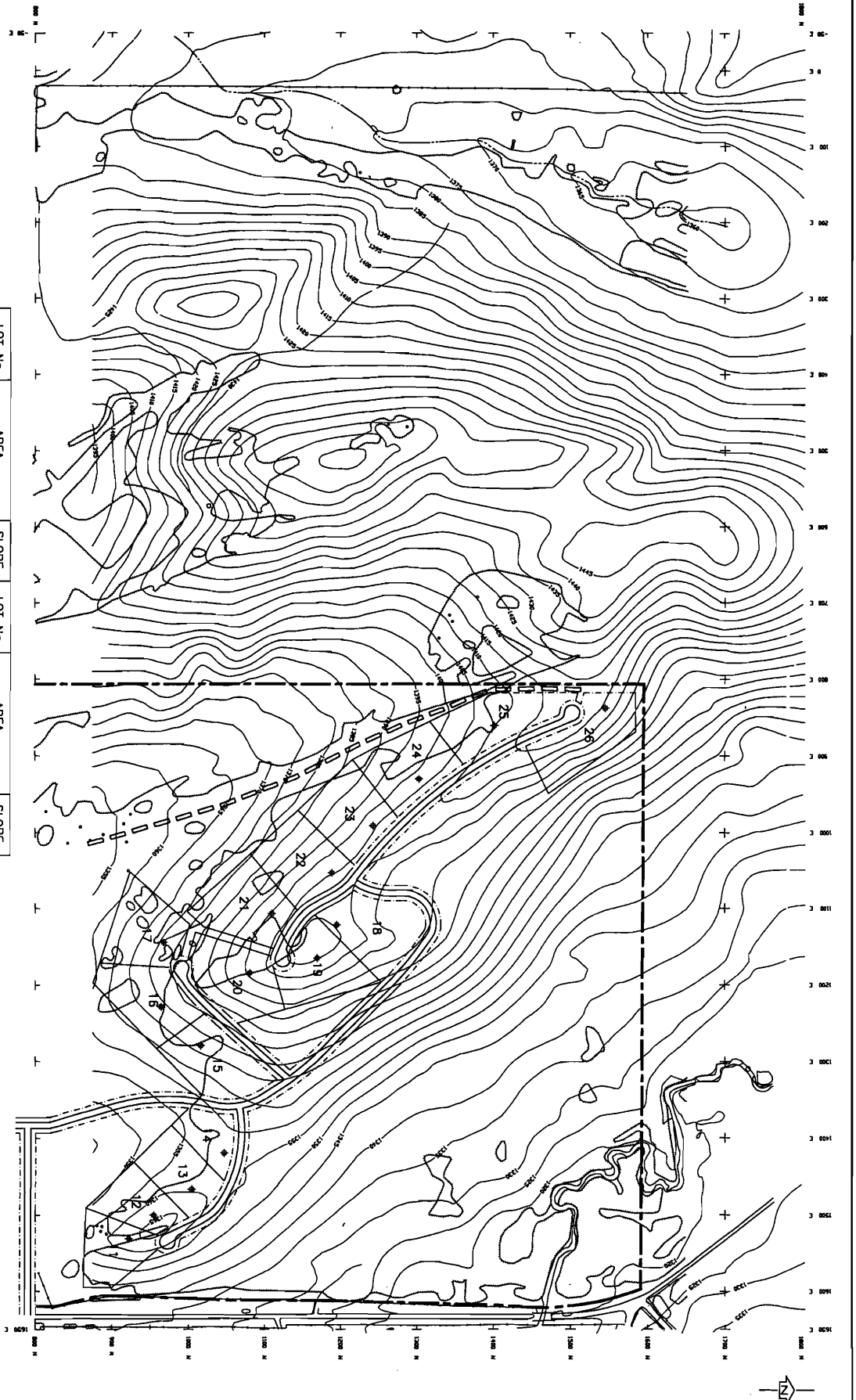
MINI-RANCH LAYOUT

for

SQUARE BUTTE RANCHES

MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
3	13.08.84	REVISIONS	BP
2	08.28.84	LETTERING	BP
1	02.24.83	PRELIMINARY	BP



LOT No.	AREA		SLOPE
LOT 11	0.7 ha	1.8 ac	10 %
LOT 12	0.6 ha	1.5 ac	16 %
LOT 13	0.8 ha	2.0 ac	12 %
LOT 14	0.4 ha	1.9 ac	5 %
LOT 15	0.7 ha	1.8 ac	18 %
LOT 16	0.9 ha	2.2 ac	18 %
LOT 17	0.9 ha	2.2 ac	14 %
LOT 18	1.0 ha	2.5 ac	10 %

LOT No.	AREA		SLOPE
LOT 19	0.9 ha	2.2 ac	3 %
LOT 20	1.0 ha	2.5 ac	16 %
LOT 21	0.9 ha	2.2 ac	18 %
LOT 22	0.9 ha	2.2 ac	16 %
LOT 23	0.9 ha	2.2 ac	22 %
LOT 24	0.9 ha	2.2 ac	18 %
LOT 25	0.9 ha	2.2 ac	14 %
LOT 26	0.9 ha	2.2 ac	2 %

LEGEND

SITE BOUNDARY

ROADS

TRAILS

WATERMAIN

WATER WELL

PROPOSED CABIN SITE

B.M. Potter Consultants Ltd.

DRWG No. H-2

DEVELOPMENT PLAN

DRAWN	C. CHURCHILL
DATE	02.24.93
APPROVED	B.M. POTTER
SCALE	.
DESIGNED	L.J. COUGHLIN
JOB No.	268-004

MINI-RANCH LAYOUT

for

SQUARE BUTTE RANCHES

MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
4	12.06.94	REVISIONS	BP
3	08.23.94	SITES	BP
2	05.30.94	LOTTING	BP
1	02.24.93	PRELIMINARY	BP

The components of the project will remain as presented with the exception that the first phase will consist of twenty-six cabins, compared to thirty-two approved, and ranch centre will have twelve ranchette units compared to sixteen approved. The remaining units may be requested in a later bareland condominium application. Also, because the development will be undertaken by investor/owners, commercial patrons will be eliminated, thereby reducing the traffic flow. The properties will not be permanently occupied. Rather, they are being designed and constructed as vacation homes and weekend retreats. The buyers will use the cabins for recreational retreats from their primary residences and will be active business people or retirees who travel during portions of the year. Municipal services will not be provided within the project ; instead those internal services will be maintained by the residents' association.

The basic design approach for Square Butte Ranches is to focus activity into a centre located in the eastern portion of the central valley and to radiate secluded clusters of cabins outward on the eastern portions of the site. As shown on the Development Plan drawings, the western portions of the central valley, the tributary valleys, and much of the higher elevations will remain as open, unfettered recreation space and natural area. A small ranch centre will feature the common facilities serving the private activities of the owners and their guests. These could include food services, social and recreation facilities, and private meeting space. Town-house style ranchette will complement the other accommodation. To the east will be the livery stable, corrals, an outdoor riding ring and a lake. The structures will be of log or wood-frame and timber construction and will be designed as a small ranching community.

The remainder of this section will describe the design approach for each of the individual facilities. But first, a discussion of the architectural theme will be presented.

5.3 Architectural Theme

The building theme for Square Butte Ranches will carry forth the local ranching tradition with an emphasis on log and timber construction. Also incorporated in the design will be substantial rock work and, where views are to be captured, timber and glass. All materials and construction are to exceed municipal standards.

The ranch centre buildings will be primarily of log or other appropriate construction but with a front facade having the appearance of a street of an historic Western Canadian small town. Featuring a boardwalk, hitching rails, overhead canopies, bay windows, and false-fronted sections, the streetscape will be rustic in nature, looking as a southern Alberta ranching town may have looked in the early 1900's.

The cabins will be sited as to maximize views but to provide seclusion and to be hidden from view from other parts of the property. They will also be primarily of log construction.

5.4 Ranch Centre

The ranch centre will in the first phase incorporate twelve ranchette units in a *Sante Fe townhouse* style, along with common facilities for private functions serving the owners and their guests. These will be designed as a rustic, historic, ranching town. The structures will be constructed primarily of log, timber, and stone, but may have false fronts. The streetscape will present a boardwalk with hitching rails and water troughs. The design of these buildings will address marketing requirements and buyer preferences as determined by the developer. The layout will reflect that shown on the Development Plan drawings. These structures will be a minimum of 40 metres from the stream course.

5.5 The Cabins

Twenty-six cabins are to be constructed in the first phase with ten to be located in the south valley and sixteen on the ridge north from the ranch centre. The layout is shown on the Development Plan drawings.

The cabins will be designed to meet the needs of the owners but will feature log construction and stone. Large decks will provide outdoor access focusing on the views. For each cabin cluster the units will be sited so as to maximize views, but keeping each cabin screened as much as possible from the valley and trails and from other cabins.

Those cabins which are sited on slopes of more than 12% will be reviewed by geotechnical engineers to determine the stability of the site, foundation requirements, backfill and landscaping conditions and access provisions.

All construction will be of a standard determined by the developer's engineers and architects and may be subject to a review by the municipal engineer at the developer's cost.

5.6 Recreation Facilities

The main focus of the active recreation facilities will be the livery stable and outdoor riding arena. The stable will be a traditional hip-roof barn of log construction, approximately 36 feet (11 metres) by 100 feet (30 metres). It will also have a hay loft accessible at grade from the north side. Adjacent to the barn will be the riding arena which will be some 300 feet (90 metres) by 140 feet (43 metres). Viewing will be provided from a sloped grass area to the northwest. The arena will be used to allow patrons to become comfortable with their mounts, for rodeo/gymkhana events, and for brandings. Along with the barn and arena will be associated corrals, paddocks, and pastures.

Canoeing and fishing will be provided at the lake. A wooden dock is to be constructed on the north side. Skating will provide an activity on the lake during the winter. A fire pit will be developed at a convenient location.

5.7 Building Foundations

The ranch centre, along with the stable, is to be located in an area within the central valley just north from the stream course. These are expected to be constructed of log and will not introduce abnormally heavy loads on the foundations. Concrete cast-in-place piles are expected to be used. Some additional soil tests will be needed at these locations to confirm foundation details.

The cabins, for the most part, will be located on the ridges where depths to bedrock are not great and the cabins can be founded on bedrock with spread or strip footings or on piles. In areas where soils are deeper, high plastic clays will be encountered and these will require special attention to the footings, subsurface drainage, and proper backfill in order to reduce the potential for moisture changes in these soils. Alternatively, the cabins sited on these clays could be founded on piles. Confirmation of the foundation details will be made by a geotechnical engineer and an inspection review letter from the geotechnical engineer will be submitted to the Municipal District on the completion of each foundation or structural floor slab.

The surface soils at many locations consist of high to medium plastic clays. These materials are subject to changes in volume (both shrinkage and swelling) with changing moisture content. This change in volume can result in significant differential movement of conventional slab-on-grade construction for floors and in turn may result in damage to the structure.

The most effective control measure is to use structural floor slabs wherever possible and avoid the use of slabs-on-grade. Structural floors are strongly recommended for buildings where subgrade moisture control is difficult such as the mechanical rooms and kitchen areas of the ranch centre.

Since the cost of structural floor systems is significantly greater, slab-on-grade floors can be considered where some movement can be tolerated. However, measures should be incorporated into the design, as appropriate, in order to minimize the magnitude of slab movements. Such measures include: increase gravel base thickness, subsurface drainage, careful site grading, proper foundation backfill procedures, and slab and partition isolation from structural elements.

All foundation excavations are expected to be relatively shallow and no excavation shoring or dewatering requirements are anticipated. Excavation side walls should be sloped to conform with Alberta Occupational Health and Safety Act requirements for protection of workers.
The principle constraint to foundation excavation will be the presence of shallow bedrock in the North Cabin areas. Although this material could be excavated to the depths shown in the test pit logs using a light backhoe, some hard, cemented sandstone stringers and shales are expected. These areas may require limited blasting to reach the desired foundation elevation.

Laboratory testing for water soluble sulphate content from three samples within the former ranch centre area indicate negligible concentrations for the samples tested. Therefore, Type 10 Normal Portland cement may be used for the manufacture of concrete in contact with the native soils at the site. A minimum twenty-eight day compressive strength of 20 MPa is recommended for durability reasons.

5.8 Municipal Road Upgrading

The municipal roadway from the southeast corner of Square Butte Ranches to the Mesa Creek corner will be widened and upgraded to full Municipal District rural standards with a 26 foot (7.9 metres) carriage way for two-way traffic. Also, the full length of the local road from the site to Secondary Road 762 will be treated for dust control. This work will be undertaken by the developer through the Development Agreement with the Municipal District and will be supported by a Bank Letter of Credit to the projected value of the project which will be drawn down as construction proceeds.

5.9 On-Site Road Development

Access to the Square Butte Ranches' facilities from the main municipal road will be via private roadways constructed at the developer's cost. The design of these will be to encourage slow speed travel. Grades will be less than 10% except for short sections. These roads will be designed to rural cross-sections and will be graveled and dust controlled. The preliminary roadway design, including the plan-profiles and typical cross-sections, are presented in the appendix. Details of the design and construction will be reviewed by the Municipal District's engineer and contained in the Development Agreement between the M.D. and the developer.

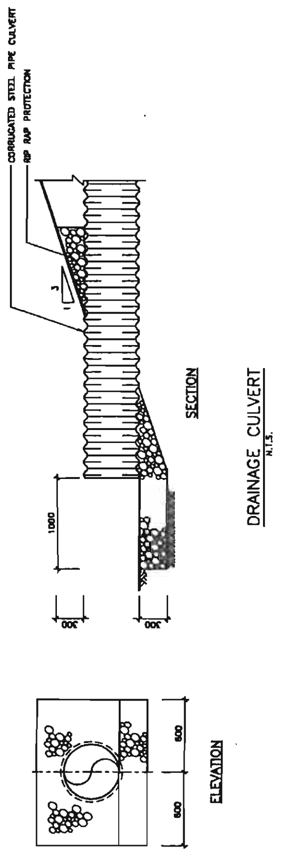
Parking and delivery areas, including those by the ranch centre, stable, and service centre, will be ditched for drainage and will be dust-controlled. Each cabin and ranchette will have two parking stalls.

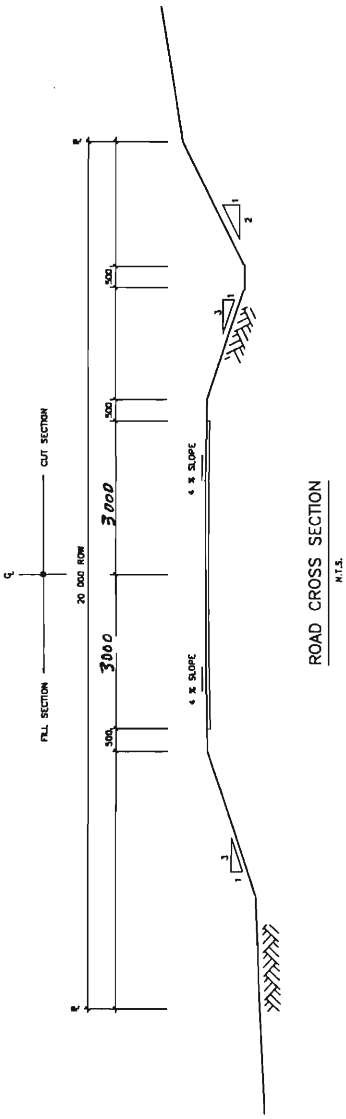
From a geotechnical point of view, there are three major constraints to roadway construction including slope stability concerns in road cut areas, impact of shallow bedrock, and road construction where soft subgrade soils are present.

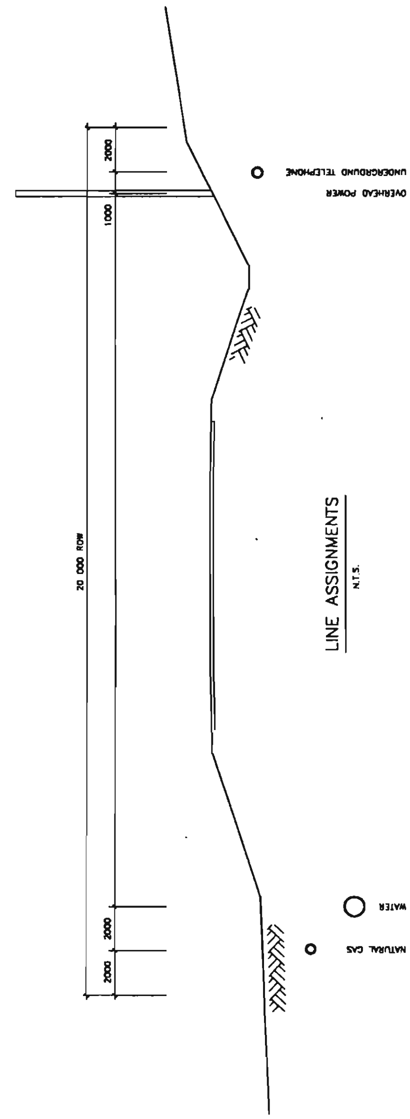
A review of preliminary roadway cross-sections indicates that roadway cuts along potential alignments are expected to be less than ten feet (3 metres) except for one location on the north ridge which may be as much as 20 feet (7 metres). Side slopes as steep as possible are desired in order to reduce tree clearing.

The deepest cuts are located on slopes leading to the north ridge. Based on the test pit results in this area, bedrock is expected to be encountered within two to six feet (0.5 to 1.7 metres) below existing ground surface. Therefore, the cuts are expected to be primarily in bedrock and the stability of this material will control the back slope requirements. Rock cuts located on this north ridge are expected to be stable at or near vertical, since the bedrock bedding planes dip into the main body of the slope at these locations. For cut slopes in stiff to hard colluvium or till, a maximum back slope of 2 vertical to 1 horizontal is recommended.

Although the cuts are expected to be stable at the slopes defined, the exposed soil and rock surfaces will be subject to erosion and raveling due to weathering processes. Replanting, rip-rap or other means of controlling erosion will be exercised. Also, to provide adequate drainage, a minimum ditch width of one-half of the height of the cut is recommended. In addition, adequate routine road maintenance will be conducted.







B.M. Potter Consultants Ltd.	DRAWN C.S. BRIGGS	DATE 12.03.92	MINI-RANCH DEVELOPMENT for SQUARE BUTTE RANCH
	APPROVED B.M. POTTER	SCALE NOTED	MILLARVILLE ALBERTA
DWG. No. D-1 ROAD DETAILS	DESIGNED L.J. COUGHLIN	JOB No. 268-004	

No.	DATE	REVISIONS	BY
2	11.08.94	LINE ASSIGNMENTS	BP
1	12.14.92	PRELIMINARY	BP

Fill slopes should be constructed at a maximum slope of two horizontal to one vertical. Flatter slopes may be required for maintenance equipment access and safety reasons.

All exposed slopes will be protected from erosion utilizing rip-up, native tree and shrub planting or replanting with native grasses.

Soft road subgrade conditions are expected in the recent lacustrine and fluvio-lacustrine materials in the central valley stream course. Unconfined shear strengths as low as five pounds per square inch (35 kPa) were recorded in these areas. Several methods of subgrade treatment can be considered in these areas including the use of geosynthetic mats, sub-excavation, and increasing the thickness of the granular road fill. For preliminary design purposes, a minimum road subgrade structure consisting of three feet (1 metre) of select granular material can be assumed for roads in the vicinity or stream courses.

The thickness of granular material may be reduced to about two feet (0.5 metres) if soil reinforcement utilizing geosynthetics such as Tensar are incorporated into the road design in areas with soft subgrade. Consolidation settlements and rutting may be expected in soft subgrade areas. These areas should not be surfaced with finished material until settlements have stabilized.

Based on the projected vehicle trips, the design traffic volumes for the project are very light. The long term performance of the roadways will be dependent upon maintaining proper drainage, including crowns, cross slopes, and ditches. These items are of particular concern when dealing with high plastic clay subgrade materials such as those present on this site.

The native clay materials on-site are suitable for use as borrow materials. However, due to the high plastic nature of the clays, particular attention will have to be paid to moisture content control. The colluvial and till materials are generally drier than optimum compaction moisture content and may require the addition of water for use in engineered fills. These materials are expected to be relatively easy to excavate and are the preferred borrow materials at the site.

The lacustrine materials on-site are also suitable for construction of fills and are particularly well-suited for the construction of relatively impermeable embankments. However, due to a wide variation in both organic and moisture content, careful selection of these materials will be required. Bedrock at the site is typically weathered near the surface and the properties of the material are expected to vary significantly depending on the specific source. Due to this variability, the material is expected to be relatively difficult to compact in a controlled manner and should be used with caution in critical fill areas.

Drainage from the roadways will be an important design requirement. In order to protect against erosion and the pollution of watercourses, drainage will be directed to vegetative filter beds before discharge in stream beds. It is recommended that salt not be used for de-icing roads. Sanding should be sufficient.

5.10 Trails

A network of hiking, riding, and cross-country ski trails is proposed for the site as shown on the Development Plans. These will be constructed by the developer to a relatively natural standard, however, locations subject to erosion or instability will be upgraded as required with timber edging, soil-matting, and gravel. Maintenance will be provided by the condominium association. The trails will mostly be located within the valley corridors to reduce impacts on wildlife.

Access to Kananaskis Country is a main feature of this development. The developer has held discussions with the officials of Kananaskis Country to ensure that the trails and facilities will be properly maintained and protected. This contact will continue.

5.11 Water Impoundments

Along the intermittent stream course in the central valley, two water impoundments will be constructed at the developer's cost. The more easterly of these is to be used for fishing, canoeing, and winter skating, and will be approximately five acres (2 hectares) in area with a dam about sixteen feet (5 metres) above the existing valley. About six feet (2 metres) of organic soil will be excavated from the impoundment giving a maximum water depth of 20 feet (6 metres) with a three foot (1 metre) freeboard on the dam. The dam will be designed by the civil and geotechnical engineers for approval by Alberta Environment. Also, the pond will be stocked with trout by the developer and maintained by the condominium association. The impoundment and spillway will be approved by Alberta Fish and Wildlife. This pond will provide stock watering for the ranch centre area and will be a water source for fire protection.

The pond located upstream of the main access road has now been constructed. It provides an ornamental amenity and has a one acre area (0.4 hectares) and depth of about ten feet (3 metres).

The subsoils in the watercourse which were investigated consist of up to six feet (2 metres) of soft, moist to wet, organic high plastic clays of lucustrine and fluviolacustrine origin. The surficial materials are underlain by stiff to very stiff colluvium and till.

The investigations also indicated that there is a base flow in the watercourse since flowing water was observed at the surface in the creek bed west of the dam location, as well as at depth in Test Pit 13. No visible surface flows were evident in the downstream dam area at the time of the investigation which strongly suggests that ground water flow, most likely in the organic surface materials, should be expected there.

An earlier concept proposed a dam further west. Based upon information obtained during the site investigation, this site will be omitted as a significant impoundment. Further examination will be conducted of providing a watering site for wildlife.

Overall conditions at the east site are expected to be favourable for the construction of the proposed dam. Soft organic subsoils are likely to be encountered along the proposed centerline and these materials will be removed. Additional soil tests will be required to confirm the subsoil conditions and to assist in the design of the structure. Also, testing of the proposed borrow site will be conducted.

The stiff, high to medium plastic clays encountered at three feet (0.9 metres) or less below existing ground surface, have sufficient strength to support an embankment in the order of fifteen to thirty-four feet (5 to 8 metres) in height, assuming no significant surcharge loads are imposed.

Both the lucustrine and colluvial materials are relatively impermeable and the dam should be designed assuming an impermeable foundation. Concerns that should be addressed in the final design include seepage through and below the embankment, slope and foundation stability, and erosion protection of the upstream face of the dam and spillway.

It is expected that the embankment may be constructed with a homogeneous cross section utilizing the glacio-lucustrine or colluvial till materials. Embankment slopes in the order of three horizontal to one vertical appear reasonable, however, the exact slope requirements, including height, will depend on the final dam configuration.

It should be noted that the medium to high plastic clays in the area will be very soft and slippery when wet. Therefore, considerably flatter slopes on the embankment and reservoir shores may be desirable from the public safety point of view. Alternatively, a granular blanket may be desirable at the waterlines.

5.12 Drainage Control

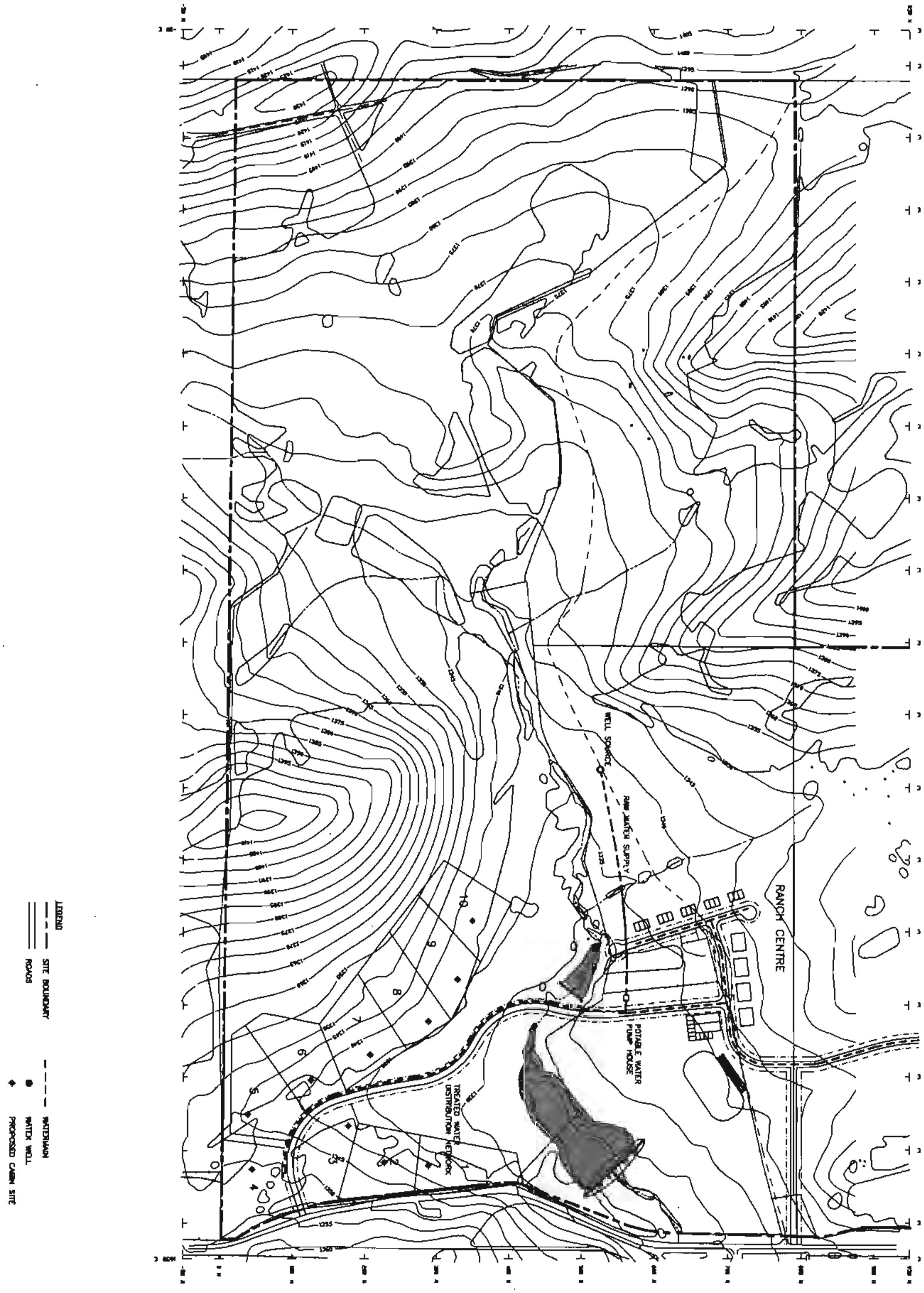
As noted above, drainage from all developed areas, including roads, building sites, and stable areas will be directed to vegetative filter beds to provide removal of silts, oils, and other contaminants. Discharge into stream courses will follow this treatment. Natural drainage courses will be protected and those without adequate vegetative cover will be rehabilitated.

5.13 Water Supply

The supply of domestic water to the Square Butte Ranches will be constructed by the developer and the system will be turned over to a utility corporation owned and operated by the condominium association. This system will be fully licensed by Alberta Environment. The design will be reviewed by the M.D. engineer and provisions for its construction contained in the Development Agreement.

Ground water, obtained from a previously tested well, will be the primary source of the potable water for Square Butte Ranches, which is estimated to be less than 5 gallons per minute. Because of the depth of the source, about fifty feet (15 metres), treatment will be provided. The Servicing Networks plan indicates the location of the water source and supply system.

It is proposed that Square Butte Ranches be supplied with domestic water by a piped, pressure system. Water meters will be installed at each unit in order to bill all water users and those with high levels of consumption will be charged a penalty. Also, all of Square Butte Ranches will be equipped with low-flow plumbing fixtures and appliances. These are designed to limit water use and will be required for every structure and facility on the site.



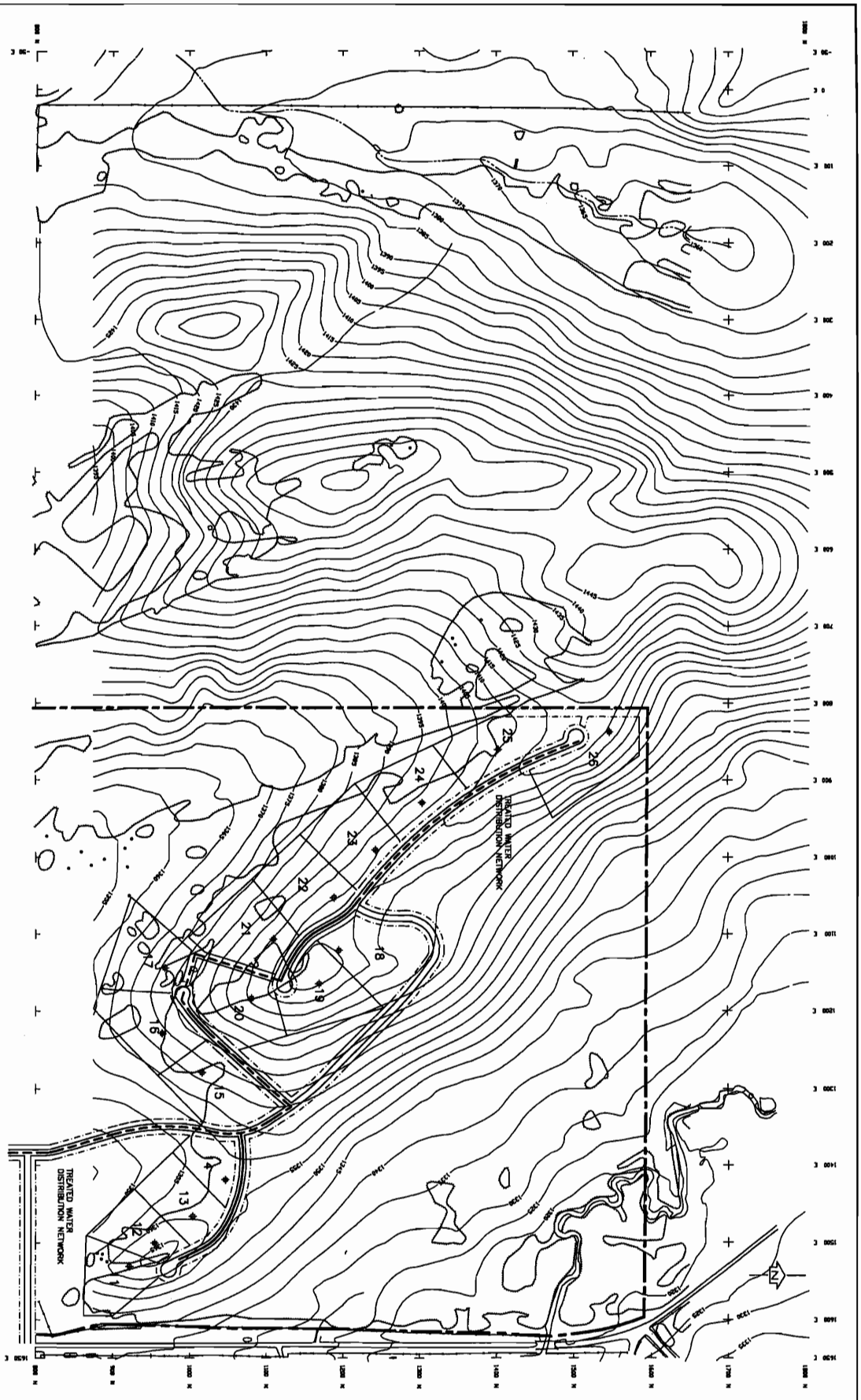
B.M. Potter Consultants Ltd.

S-1 SERVICING NETWORKS

C. CHURCHILL	11.08.04
B.M. POTTER	
B.M. POTTER	

MINI–RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES

ALBERTA



B.M. Potter Consultants Ltd.

DRAWN: C. CHURCHILL	DATE: 11.08.94		
APPROVED: B.M. POTTER	SCALE:		
DESIGNED: B.M. POTTER	JOB No.: 288-004		

SERVICING NETWORKS

SHEET S-2

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
2	12.08.94	REVISIONS	BP
1	11.08.94	PRELIMINARY	BP

The ground water supply on the site has been investigated thoroughly and provides positive evidence of ample ground water. All wells have not been tested to Alberta Environment standards except one secure well, with a twenty year safe yield established at 4 gallons (18 litres) per minute. This volume is almost the total amount needed for the development and it is this well, plus one other still to be tested, which are proposed to be used for development.

This productive well, noted as WW3 on the Test Location Plan in the appendix, was drilled to the west of the ranch centre. Water was encountered as the drill entered a fractured bedrock just below the surface clays. It appears as though this is along the east/west fault. The well was drilled to fifty feet (15 metres) and flowed to the surface at 3 gallons (13 litres) per minute. The well was completed with casing and screen and was bail tested at approximately forty gallons per minute (180 litres per minute). Two observation wells were also drilled, one to the northeast (WW5), and one east (WW4) of the production well.

Following receipt of the necessary exploration permits, the well was test produced at a stepped rate up to twenty-five gallons per minute (110 litres per minute) and then tested at fifteen gallons per minute (67 litres per minute) for 72 hours. Measurements were made at the observation wells, at the spring by the lodge site, and at a well nearly two miles (3 kilometres) south. Chemical and biological analysis has shown the potability of the water, but it does contain iron.

Following the work for the master plan, five additional water wells were drilled at various locations around the property. These are also shown on the Test Locations plan and all encountered water but none at the volumes present in WW3. As such, they become useful backup supply and may be used for stock watering.

Because the earlier ground water exploration permit has lapsed, a new permit has now been received. It is proposed that the records for all the wells be examined, documented, and a testing program conducted for the additional supply. Then, a license for the primary supply wells will be sought. Also, the supply and treatment system will be designed and licensed. A review of the water demand will be conducted, based on the water conservation methods to be incorporated, and the system will be licensed for that volume, plus some surplus for security of supply.

5.14 Sewage Disposal

Sewage treatment facilities will be constructed by the developer and maintained by the condominium association. The design and installation of the systems will be reviewed by the M.D. engineer and approved by Provincial authorities. Construction will be under the provisions of the Development Agreement.

Sewage disposal by normal septic tanks and mounded tile field systems is proposed for all developments on the site. Because of the low permeability of the clay soils along the valley floor and the shallow topsoil along the north ridge, the design of the disposal fields will be important. It is the intention of Square Butte Ranches that designs for all systems be reviewed and approved by a geotechnical engineer prior to applications being forwarded to the approval agencies. Confirmation of the installation of each septic field will be made by the geotechnical engineer and an inspection review letter submitted to the Municipal District.

A combined field will be used for the ranch centre and separate fields for each cabin. If practical, two or more cabins may be serviced by a common field. As the use of the cabins will be occasional and not full time, this will be the most practical method for disposal.

While this method of sewage disposal is a tried-and-true application, an examination of a new treatment process for rural applications will also be undertaken. This system uses an electrically driven aeration process within a septic tank and produces a secondary level of treatment. The effluent can then be discharged to surface, into either a grass bed or a forest. If worthwhile, this system may be considered and the necessary applications submitted. The developers intend to use the most appropriate system for sewage treatment.

5.15 Solid Waste Control

All solid refuse will be collected in animal-proof containers provided by the developer at each accommodation unit. Collection and disposal of wastes will be the responsibility of the condominium association. Wastes from the kitchen at the ranch centre will be separated; those suitable for animal feed will be taken to a local farm and the remainder will be collected in containers. All material feasible for recycling will be disposed of to local depots and the remaining waste will be trucked to the Municipal District landfill site. These operations will be conducted year-round. An innovative recycling centre, in keeping with the philosophy of the development, and an incineration system will be considered to reduce waste disposal requirements.

Manure from the livery stable will be regularly collected and spread on pastures. Proper separation from stream courses will be maintained.

5.16 Electric Power

The developer will arrange with TransAlta Utilities to provide a new three-phase electric service to Square Butte Ranches by overhead line to the east side of the site. Distribution of a single phase, domestic service will be provided underground to all facilities within the ranch centre and overhead distribution will be constructed to cabins along the internal road right-of-way. The proposed location of the shallow utilities within the road alignment is shown in the Line Assignments sketch included on the Road Details plan. Construction will be under the provisions of the Development Agreement.

5.17 Telephone

The developer will provide underground domestic telephone service to each cabin, the ranch centre and the stable through Alberta Government Telephones. Construction will be under the provisions of the Development Agreement.

5.18 Natural Gas

Underground natural gas service of a domestic standard will be provided by the developer to each facility through Canadian Western Natural Gas. Dwelling units will be heated during the winter months to ensure protection of the investment and to provide convenient recreational use during the winter. Construction will be under the provisions of the Development Agreement.

5.19 Service Facilities

The main service centre will be located in the vicinity of the livery stable. Facilities will include a small workshop and maintenance building, a garage for operating and maintenance equipment, and a screened outdoor storage area. These will be constructed in a western decor.

5.20 Site Supervision and Staffing

Twenty-four hour management and supervision will be maintained at Square Butte Ranches by the condominium association and the ranch club. Staff will have supervisory as well as other duties and an on-site management couple will be accommodated at the ranch centre. Recording facility utilization, managing the common facilities, maintaining the buildings, servicing the water supply system, collecting solid wastes, and conducting regular inspections of the cabins (when not occupied) will be among the duties of the staff. In addition, a variety of recreational and equestrian programs will be operated which may require other staff.

5.21 Fire Protection

There will always be a danger from fire in the rural landscape. For Square Butte Ranches, this danger will be thoroughly examined and all reasonable methods taken to prevent such an occurrence. These steps will include:

❶ installing a dry hydrant and a pump in the large pond to enable quick refills of fire trucks ; (This system will also be available to the Municipal District Fire Department to assist in fire fighting within the surrounding area.)

❷ clearing a buffer of some thirty feet (9 metres) around each building and ensuring that the fuel within this area remains low and applying fire retardant to wooden roofs ;

❸ ensuring adequate grazing of the open areas to prevent dry grass from becoming a hazard;

❹ advising all patrons of the dangers of fire and warning of high fire hazards;

❺ maintaining full-time supervision of the property;

❻ supplying adequate equipment for a quick response, including hand tools, hand pumps, and a portable hose/spray system;

- ❼ training all staff and cooperate with interested owners in fire protection and fire-fighting;

- ❽ ensuring that all buildings are equipped with fire extinguishers which will be serviced regularly.

5.22 Emergency Response

Because of the presence of sour gas wells and processing plant south from the site, Square Butte Ranches will be required to work with Esso Resources Canada Ltd. and a community group on an evacuation plan in preparation for an emergency with these facilities. A consultant was retained by Esso to update the Emergency Response Plan and Square Butte Ranches will be incorporated into its procedures.

5.23 Bareland Condominium Plan

Following the final reading of the Redesignation of the Square Butte Ranches site to Resort Recreation District, a plan for a bareland condominium will be prepared by the developer. This plan will provide for the subdivision of the individual cabin and ranch centre townhouse sites, generally as shown on the Development Plan. The plan also shows the location for public reserve dedication based on 10% of the area of the titled sites. The remaining land will be held as common property by the condominium association and the remaining public reserve will be deferred by caveat against that title. It is proposed that the dedicated public reserve be leased back from the Municipal District for a 20 year period.

Along with the bareland condominium plan, a Development Agreement will be negotiated and signed between the Municipal District and the Square Butte Ranches Ltd. This agreement will provide for the proper installation of all services and utilities.

Section 6

Implementation Procedures

6.0 Introduction

A number of procedures will be required leading the development of Square Butte Ranches. Some of these will require the involvement of the Municipal District, others will require the developer to initiate design processes or expertise, while others will require the involvement of additional approval agencies. Many of these processes must occur concurrently. A brief description of each is presented below.

6.1 Planning and Development Approval Processes

Following the appropriate land use approvals, the developers will commence action on:

❶ Finalization of the bareland condominium plan and its associated bylaws, submission to the Municipal District for approval, followed by registration with land titles. A condition to this approval will be the negotiation and execution of a Development Agreement between the Municipal District and Square Butte Ranches Ltd. This will be accompanied by a Letter of Credit posted by the developer to ensure the project is constructed according to the approved designs.

❷ Finalization of the design, by a professional engineer, for the larger dam and impoundment, submission for approval from Alberta Environment and Alberta Fish and Wildlife.

❸ Finalization of designs by licensed architects and/or professional engineers, with geotechnical reviews in some cases, for those buildings requiring professional design. Submission of building designs to the Municipal District for building permits, thereby allowing construction to begin;

❹ Building inspections and issue of occupancy permits by the Municipal District.

6.2 Design and Approval Processes

In order to move into construction, the owners will be required to prepare and have design drawings approved for:

❶ Municipal road upgrading for approval by the Municipal District;

❷ On-site road design, prepared by a professional engineer, including geotechnical reviews for critical areas, for approval by the Municipal District;

❸ Building designs, prepared by licensed professionals where necessary, as noted above;

❹ Water supply well, treatment system, and community distribution network designed by a professional engineer, then approved and licensed by Alberta Environment;

❺ Sewage disposal system designed by a professional engineer, reviewed by geotechnical engineers, and approved by Alberta Environment;

❻ Water impoundment designed by a professional engineer, reviewed by a geotechnical engineer, and approved by Alberta Environment;

❼ Design of the shallow utilities (electricity, telephone, and gas) by a professional engineer and approval of these by the franchised utility companies.

The above components will, where appropriate, be included in the Development Agreement between the Municipal District and Square Butte Ranches Ltd.

Appendix A

Ownership of Square Butte Ranches - 1994

NE 17 - 21 - 4 - W5M	Mr. Max Gibb
NW 17 - 21 - 4 - W5M	Dr. Simon Hudy
SE 20 - 21 - 4 - W5M	Mr. Joe Killi

Appendix B

Tera Environmental Consultants (Alta.) Ltd.

Assessment of Potential Impacts to
Flora and Fauna

tera
ENVIRONMENTAL
CONSULTANTS (ALTA.) LTD. SUITE 205, 925 - 7th AVENUE S.W., CALGARY, ALBERTA T2P 1A5 • 265-2885 • 266-6471 (Fax) •

SQUARE BUTTE RANCHES DEVELOPMENT ASSESSMENT OF POTENTIAL IMPACTS TO FLORA AND FAUNA

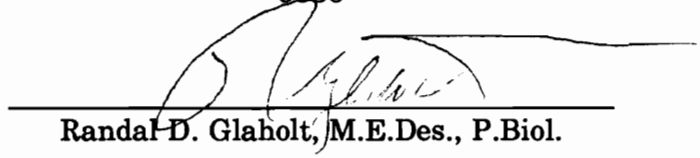
Prepared for:

Kyllo Planning and Development Ltd.

Prepared by:

TERA Environmental Consultants (Alta) Ltd.

November, 1994
9536



Randal D. Glaholt, M.E.Des., P.Biol.

EXECUTIVE SUMMARY

TERA Environmental Consultants (Alta.) Ltd. conducted a review of the proposed Square Butte Ranch Development for the purpose of determining to what extent native flora and fauna may be impacted and to provide recommendations for impact mitigation. With appropriate mitigation and user practices impacts can be kept to a minimum and may in some cases result in a net increase in habitat capability for certain species of flora and fauna.

Compared to present conditions, the proposed development will result in some loss of wildlife habitat capability and potentially result in some decline in wildlife productivity within the municipality, adjoining Kananaskis Country and beyond. Attainment of population goals for mule deer and cougar as prescribed in provincial wildlife management plans may be somewhat compromised as a result. Particularly unique habitats for "rare" plants do not occur on the property, however, the potential remains for some of these species to occur. Taken in isolation of other developments occurring in the area the proposed development will result in a relatively small loss of habitat for native flora and fauna. The proposed development will add cumulatively to impacts caused by increasing amounts of human activity and associated development taking place in the municipality as well as in more remote locations. Taken together these impacts are likely resulting in a much more substantial reduction in species habitat effectiveness and productivity within the municipality.

By concentrating the proposed development along the eastern edge of the property and, attempting to confine the overall footprint of the development and ensuring full implementation of the corporate philosophy, Square Butte Ranches will substantially reduce potential impacts relative to what would have occurred had the same project been spread out further to the west.

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LIST OF PLATES

1.0 INTRODUCTION

TERA Environmental Consultants (Alta) Ltd (TERA) was contracted by Kyllo Planning and Development Ltd. to conduct an environmental assessment of the proposed Square Butte Ranch Development located near Millarville, Alberta (Figure 1; Plates 1 and 2). The west side of the property borders Zone 4 lands in Management Area D of Kananaskis Country. First level management priorities in this area are: 1) maintenance of water quality, quantity and flow regime; and 2) maintenance or enhancement of the natural environment and landscape. The proposed development site itself is entirely on private land and does not occur within any provincially designated Wildlife Key Areas or Environmentally Sensitive Areas. The scope of the assessment was to conduct a qualitative evaluation of the proposed development's potential impacts on the native flora and fauna and to provide recommendations for impact mitigation. The proposed development site was examined by TERA's wildlife biologist and plant ecologist on 24 October 1994. The results of that assessment are summarized below. All site references are based on site drawings H-1 and H-2 provided by B.M. Potter Consultants Ltd.

2.0 ENVIRONMENTAL SETTING

The proposed development occurs at the south end of the Lower Boreal Cordilleran Ecoregion in close proximity to the Aspen Parkland Ecoregion to the east and south and Subalpine Ecoregion to the west. In the absence of conflicting land use this ecoregion supports a large range of vertebrate and invertebrate species and a diverse vegetation communities. A list of plants and animals with special conservation status which may occur in this ecoregion and which may find some suitable habitat within the Square Butte Ranch property is provided in Appendices 1 and 2.

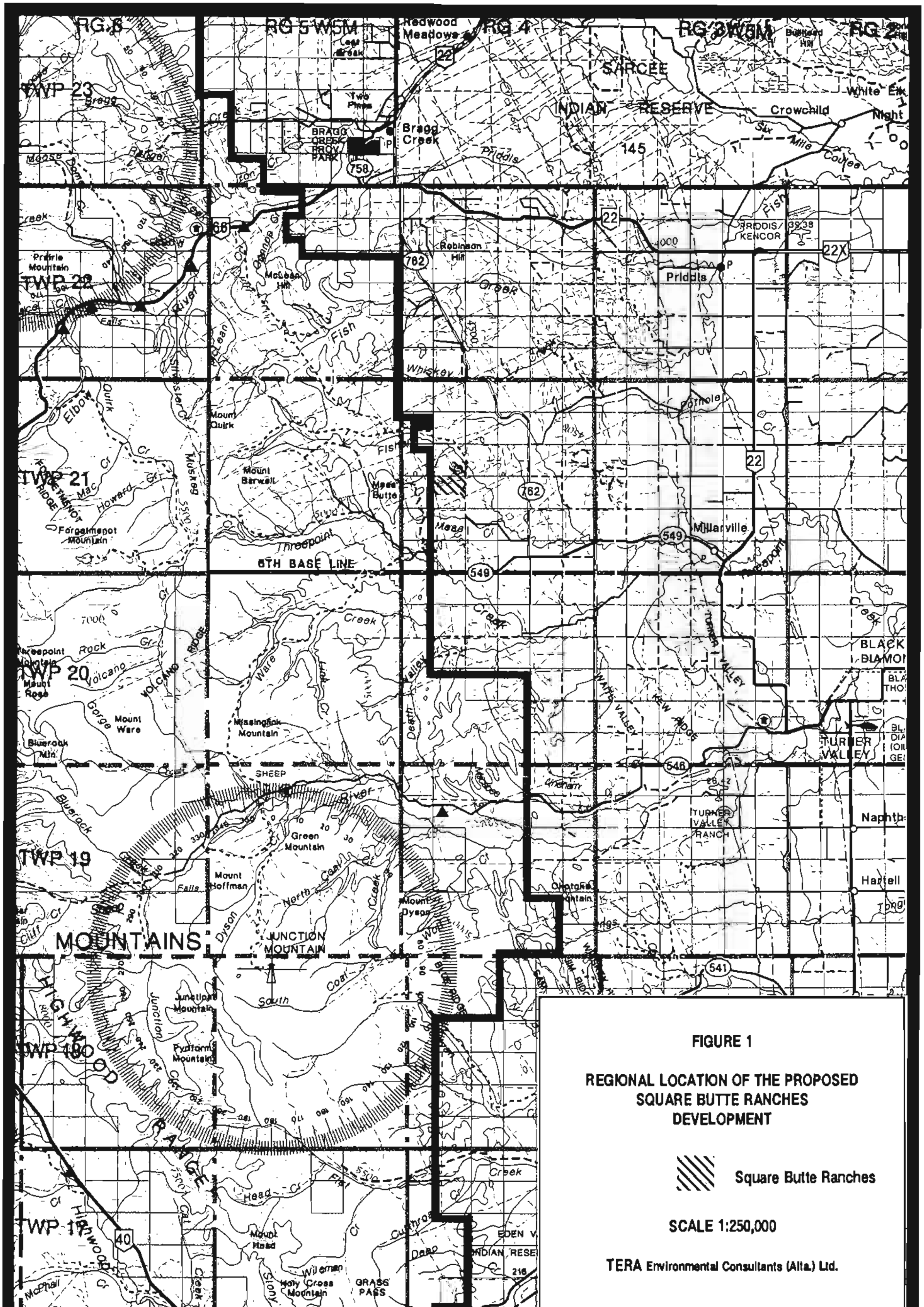


FIGURE 1

REGIONAL LOCATION OF THE PROPOSED SQUARE BUTTE RANCHES DEVELOPMENT

Square Butte Ranches

SCALE 1:250,000

TERA Environmental Consultants (Alta.) Ltd.

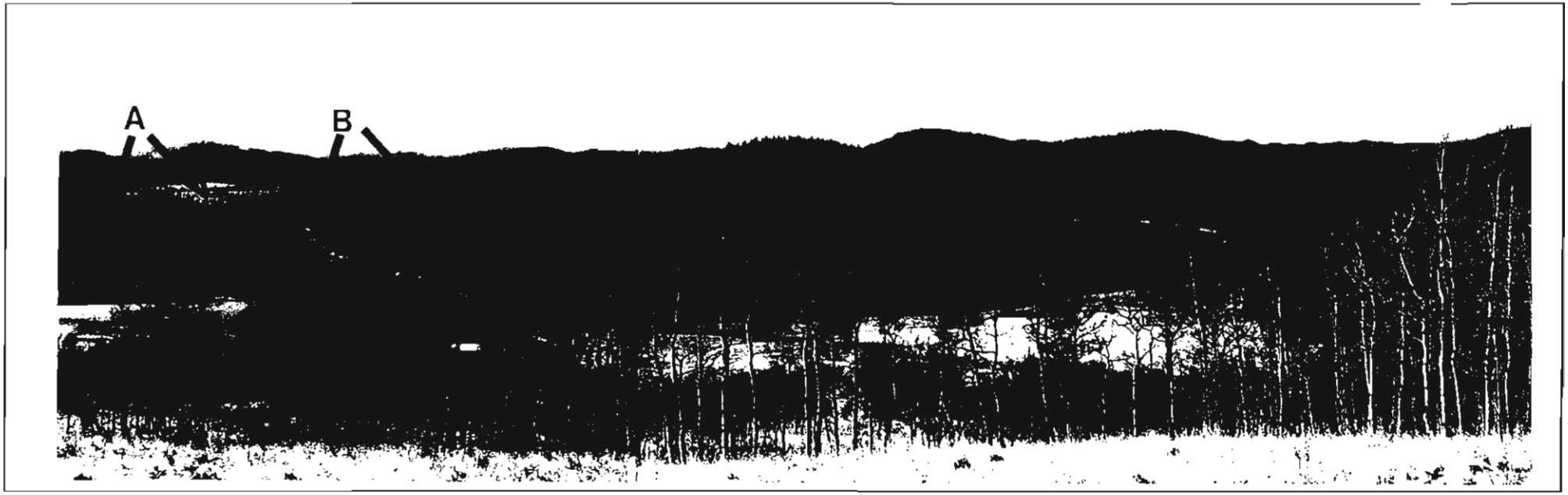


Plate 1: View south to approximate locations of cabin sites 1-4 (A) and 5-10 (B) and ranch centre (C).

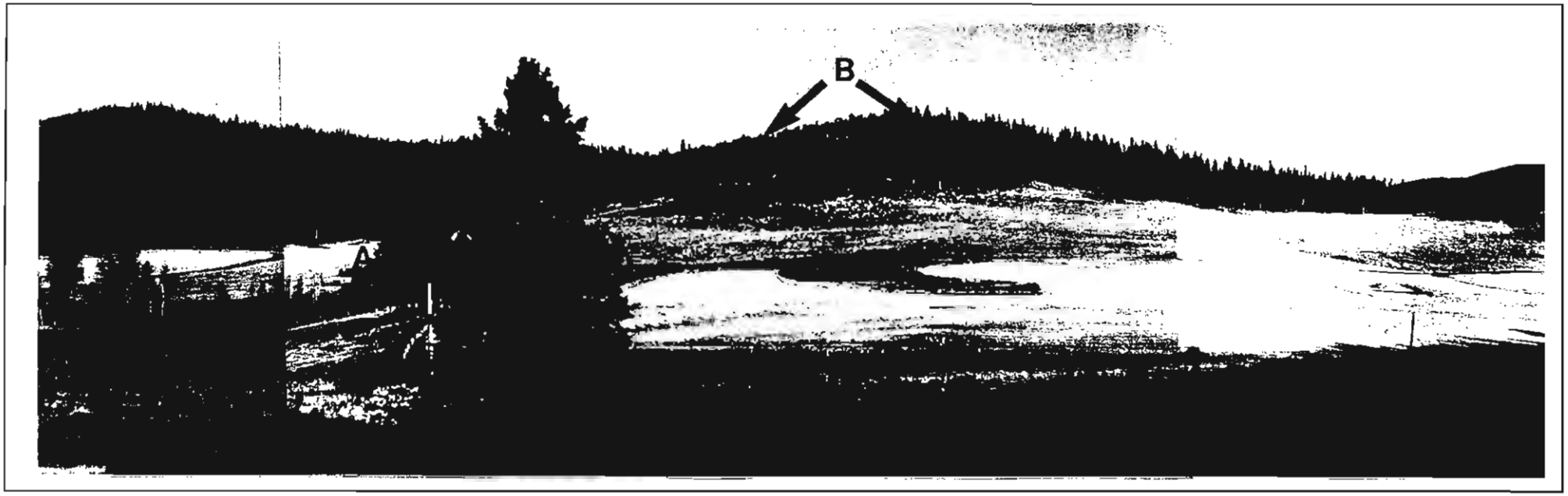


Plate 2: View north to approximate location of ranch centre (A) and cabin sites 11-26 (B).

The site is topographically varied and partially bisected by one well defined drainage. At least one spring also occurs on the property. These factors, coupled with the area's soils and climate have facilitated the establishment of a mosaic of vegetation communities which include; south facing grasslands; mixed deciduous/coniferous ridge lines; dense north facing spruce dominated woodland and riparian shrublands.

Non-native grassland on the property is dominated by bromegrass, timothy and alfalfa. Thistle and hemp-nettle are also present. Mixed coniferous forest occurring on the property includes white spruce, lodgepole pine, juniper, wintergreen, bunchberry, bearberry, twinflower, labrador tea, various fruticose and foliose lichens and mosses. Alders form a conspicuous part of the understorey in forested habitat along the southwest border of the property. Mixed wood forest occurring along the ridgelines at the north edge of the property includes aspen, white spruce, lodgepole pine with an understorey of grasses and herbaceous species including fireweed, asters, yarrow, northern bedstraw and meadow rue. Arboreal lichens are also present on some of the more mature coniferous trees. The riparian area roughly bisecting the property includes extensive growth of red osier dogwood, willows, alder, equisetum, sedges and dock. Aspen communities occur at the transition zone between the lower grasslands and mixedwood communities found on the northern ridgeline. These communities include a shrub understorey of rose and buckbrush and a herb layer containing various grasses including junegrass, rough fescue, orchard grass and herbaceous species such as yarrow, three flowered avens, sticky geranium, northern bedstraw and others.

Very roughly half of the property has been cleared of forest cover and converted to pasture or hayland and is being grazed by cattle and horses. At the present time surrounding land use and associated habitat fragmentation is such that the ecological integrity of the area is still relatively intact, however enough development has occurred that habitat effectiveness for species such as grizzly bear is likely low.

3.0 POTENTIAL IMPACTS

3.1 Fauna

The proposed development and the human activity associated with it will result in some displacement of wildlife and loss of habitat. By concentrating the proposed development at the east end of the property near the existing road, impacts on wildlife have been substantially reduced relative to what they would have been had the development been more broadly dispersed over the property. All sites proposed for development are currently in a natural or semi-natural state and as such can be expected to provide wildlife habitat which contributes to the maintenance of species whose range is spread over neighbouring properties, the municipality, Kananaskis Country and beyond. The proposed development will also result in loss of some breeding habitat for migratory songbirds which are also experiencing habitat loss on their southern winter range. Displacement of ungulates will have attendant effects on predators, such as cougar, whose survival is strongly tied to the availability of large herbivores.

3.2 Flora

As the Square Butte Ranch Development is situated in close proximity to three different ecoregions the potential list of rare plants which may occur in the area is quite large (Appendix 2), particularly given the range of exposures, topographical relief, soil characteristics and varied hydrological regime occurring at the site. These same ecosites are relatively broadly distributed on neighbouring properties and extend into Kananaskis Country to the west. While rare plants may certainly occur on the Square Butte Ranch property, they would appear to have as much likelihood of occurring on adjacent properties. Further mitigating against the possible occurrence of rare plants on the property is the extensive area of non-native pasture in the vicinity of the proposed Ranch Centre, livestock grazing over much of the property, disturbance of natural drainages by livestock and the existing trail and road network.

3.3 Evaluation of Proposed Development Sites

3.3.1 Cabin Sites 1 - 4

The semi-open forested sites which will be developed for cabin units 1 through 3 appear to have relatively low wildlife habitat capability due to limited structural diversity, poorly developed vegetation understorey, lack of surface water, proximity to an existing road, fragmented nature of the habitat and human activity in the area. This area is believed to receive relatively greater use by avian species (eg. mountain and boreal chickadee, red-breasted nuthatch, gray jay) and small mammals (mice, voles, snowshoe hare, squirrels) than large mammals. Controlled development of these sites will likely have minor negative impact on these species. With mitigation and appropriate user attitude habitat capability for these species may be enhanced. Site 4 is already developed, implementation of appropriate mitigation at this site will, to some extent, restore habitat capability for some species at this location.

3.3.2 Cabin Sites 5 - 10

Cabin units 5 through 10 occur at the base of a dense, spruce dominated knoll which shows some occasional use by deer and small mammals. Avian species such as mountain chickadee, varied thrush, McGillivray's warbler, Townsend's solitaire and three-toed woodpecker may also find suitable habitat in this area. Small mammal diversity is likely greatest closer to sites 9 and 10 as these areas encroach on forested areas which have a more developed understorey and border a watercourse. Impacts on large mammals will likely be somewhat greater than those experienced at sites 1 - 4. With mitigation and appropriate user attitude impacts on avian species will be reduced and, for some species, habitat capability may be enhanced.

3.3.3 Cabin Sites 11 - 26

With respect to large mammals, the most significant habitat occurs along the north half of the property and includes the proposed development sites for cabin units 11 through 26. The habitat complex of concern in this area is a series four south facing ridges which are backed by dense coniferous woodland. South facing grass dominated ridges with interspersed mixed forest types such as occurs on the Square Butte Ranch property are considered to be high quality range for both deer and elk, particularly in winter months. These sites also provide valuable habitat for a variety of avian species (eg. solitary vireo, rose-breasted grosbeak) and small mammals. Preliminary examination of the property revealed the most intensive signs of use by elk and deer within this habitat complex. Signs of use appeared somewhat greater on ridges further west of the road.

The proposed development of cabin units 11 through 26 and the ranch centre at the currently proposed location will substantially reduce ungulate use of the eastern end of the south facing ridge complexes. Development of the more eastern south facing ridges will have much less impact than if the development was proposed further west.

3.3.4 Ranch Centre

The site proposed for the ranch centre is currently hayland/pasture which likely receives some use by deer and elk though its distance from cover, exposure and proximity to existing agricultural operations suggest that this use is limited. Development of the ranch centre at the east edge of the property is preferred over other physically suitable locations located further west.

The riparian area which lies immediately south of the proposed ranch centre and north of cabin units 1 through 10 exhibits a relatively low level of recent use by moose, elk or deer for foraging. While development of riparian vegetation is relatively limited, it is likely still facilitating east-west wildlife movement for large and small

mammals as well avian species (eg. dusky flycatcher, Wilson's warbler, orange-crowned warbler, Le Conte's sparrow). As currently proposed, the access road to the ranch centre will traverse the existing riparian zone. The proposed ranch centre and pond will also impinge on the riparian zone to some degree. It is anticipated that these two developments (road and ranch centre) will substantially reduce the extent to which the existing riparian area is being used by large mammals as a movement corridor. Avian species will be much less affected. Creation of the proposed impoundment will likely reduce some north-south small mammal movement. Selective planting of trees, shrubs, grasses and herbaceous species, along with an appropriate user attitude would help significantly reduce impacts and may in some cases enhance wildlife habitat capability in this area.

3.3.5 Access Road

The proposed access road from Site 4 to the proposed Ranch centre and its continuation to Sites 14 an 15 is primarily confined to existing non-forested openings which are currently being used for livestock grazing. Impacts to large mammals such as deer and elk in this area are believed to be relatively minor. The ridge line location of the road behind sites 18 - 26 will result in a greater reduction in habitat capability for medium to large mammals than other segments of the road. Given the low anticipated vehicle speeds along the road and good visibility of surrounding terrain, animal/vehicle collisions involving medium to large mammals will likely be minimal.

3.3.6 Aquatic Ecosystems

The unnamed watercourse flowing through the riparian zone is intermittent and shallow and does not support fish. Stream characteristics are such that productivity and diversity of aquatic invertebrates is also believed to be very low. Development impacts on the existing aquatic ecosystem are expected to be negligible. Development of the proposed water impoundment/pond will significantly increase aquatic ecosystem productivity and biodiversity.

4.0 CONCLUSION

With appropriate mitigation and user practices impacts can be kept to a minimum and may in some cases result in a net increase in habitat capability for certain species of flora and fauna.

Compared to present conditions, the proposed development will result in some loss of wildlife habitat capability and potentially result in some decline in wildlife productivity within the municipality, adjoining Kananaskis Country and beyond. Attainment of population goals for mule deer and cougar as prescribed in provincial wildlife management plans may be somewhat compromised as a result. Particularly unique habitats for "rare" plants do not occur on the property, however, the potential remains for some of these species to occur. Taken in isolation of other developments occurring in the area the proposed development will result in a relatively small loss of habitat for native flora and fauna. The proposed development will add cumulatively to impacts caused by increasing amounts of human activity and associated development taking place in the municipality as well as in more remote locations. Taken together these impacts are likely resulting in a much more substantial reduction in species habitat effectiveness and productivity within the municipality.

By concentrating the proposed development along the eastern edge of the property and, attempting to confine the overall footprint of the development and ensuring full implementation of the corporate philosophy, Square Butte Ranches will substantially reduce potential impacts relative to what would have occurred had the same project been spread out further to the west.

5.0 RECOMMENDATIONS

The recommendations which follow are directed primarily at measures designed to offset potential impacts to native flora and fauna.

1. In the absence of other planning considerations, thoughtful development of the forested knoll which includes proposed cabin sites 5 - 10, at the southeast end of the property, would result in fewer impacts to wildlife than developments which encroach on the south facing ridge complex.

2. Minimize unnecessary removal of forest and shrub cover.

3. The greater the buffer between the Ranch Centre and its associated activities from the riparian zone the less the impact on wildlife and vegetation. Maintain at least a 50 m buffer from the existing riparian zone if possible.

4. Use an appropriate mix of native shrubs, trees and grasses to screen the riparian zone from the Ranch Centre and to promote wildlife habitat values.

5. Discourage the keeping of cat or dogs. Any dogs brought to the site should be kept on a leash.

6. Structure the water impoundment to provide secure habitat for waterfowl and to allow overwintering of any stocked fish. Stock the pond with rainbow trout, cutthroat trout or brook trout.

7. Structure the impoundment to provide suitable habitat for aquatic plants and invertebrates.

8. Consider introducing native leopard frogs and possibly long-toed or tiger salamanders to the pond area once the pond environment has been well established.

9. Consider establishment of an additional small, secluded impoundment upstream from the proposed impoundment to provide an alternative, less disturbed area for wildlife to access water.

10. Provide water troughs for livestock and restrict livestock access to riparian corridors.

11. Restore and enhance the spring fed pond at the north west end of the property to promote use by wildlife.

12. Use an appropriate mixture and configuration of native trees, shrubs and grasses to increase the effective habitat edge along existing clearings and to reduce habitat fragmentation caused by the existing cleared pastures. Livestock use of such areas should be excluded.

13. Stabilize and restore segments of the existing riparian corridor which have been damaged by livestock.

14. Consider the erection and strategic location of nest platforms with stick nests using some of the large trees removed during construction of cabin sites. Encourage the use of bird feeders and bird houses.

15. Any fencing should be "wildlife friendly".

16. Any trail development should be constructed in such a way as to subtly encourage use in appropriate areas.

17. A waste management strategy should be developed to minimize the potential for problem wildlife, especially the attraction of bears.

18. The use of all terrain vehicles off designated access routes on the property should be discouraged.

19. Road design and maintenance should be such that the use of salt is minimized.

20. Develop a residents information package regarding wildlife.

APPENDIX 1

Vertebrate Species With Special Conservation Status Which May Occur in the Vicinity of Square Butte Ranches

	Status		
	COSEWIC	Alberta	Generalized Habitat Association
Grizzly Bear (*Ursus arctos*)	Vulnerable	Blue	Various; open areas, river valleys, meadows, brushlands.
Wolverine (*Gulo gulo*)	Vulnerable	Blue	Dense forests, treeline.
Lynx (*Lynx canadensis*)	N.L.	Blue	Coniferous and mixed forest.
Bobcat (*Lynx rufus*)	N.L.	Blue	River valleys, coulees, open forest.
Cooper's Hawk (*Accipiter cooperii*)	Vulnerable	Blue	Forest interiors, pure and forest stands.
Long-toe Salamander (*Ambystoma macrodactylum*)	N.L.	Blue	1,000 - 2,000 m asl, subalpine and alpine, near water.

1. COSEWIC: Committee On The Status Of Endangered Wildlife In Canada, 1994. Alta: Alberta Forestry Lands and Wildlife, 1991. The Status of Alberta Wildlife. Note: "N.L." = not listed, species listed as "Red" are at serious risk of declining to non-viable population levels and have or will be provincially designated as endangered. "Blue" listed species are also considered at risk of declining to non-viable population levels, however, threats are considered less immediate than "Red" listed species. Species which are considered vulnerable but for which information is lacking are also "Blue" listed species.

APPENDIX 2

Rare Vascular Plants which may occur in the Vicinity of the Proposed Development[1]

Species	Common Name	Habitat	Canadian Status[2]	Canadian Priority[3]	Alberta Status[4]
Adenocaulon bicolor Hook.	Pathfinder Plant, Trail Plant	Moist woods and thickets	N.R.	N.R.	N.R.
Allium geyeri S. Wats.	Geyer's Wild Onion	Wet meadows & stream banks	N2	2	S2
Anemone quinquefolia L.	Wood Anemone	Moist woods	N.R.	N.R.	N.R.
Antennaria corymbosa A. Nels.	Corymbose Everlasting	Open woods & meadows	N1	4	S1
Antennaria luzuloides T. & G.	Silvery Pussytoes, Silvery Everlasting	Dry rocky sites	N.R.	N.R.	N.R.
Aquilegia formosa Fisch.	Western, Crimson or Sitka Columbine	Open woods and rocky slopes	N.R.	N.R.	N.R.
Arnica parryi Gray	Nodding Arnica	Open woods, grassy slopes, scree slopes	N.R.	N.R.	N.R.
Artemisia tridentata Nutt.	Big Sagebrush	Dry hills	N.R.	N.R.	N.R.
Aruncus sylvester Kost.	Goatsbeard	Moist woods	N.R.	N.R.	N.R.
Aster campestris Nutt.	Meadow Aster	Dry open areas	N.R.	N.R.	N.R.
Botrychium paradoxum W.H. Wagner	Paradoxical Grape Fern	Moist grassy slopes in mountains	N1	1	S1
Botrychium simplex E. Hitchc.	Dwarf Grape Fern	Moist meadows & shores	N.R.	N.R.	N.R.
Brickellia grandiflora (Hook.) Nutt.	Large-flowered Brickellia	Dry slopes, shores & roadsides	N1	5	S1
Bromus vulgaris (Hook.) Shear	Mountain Brome, Narrow-flowered Brome-grass	Moderately moist and open coniferous woods	N.R.	N.R.	N.R.
Bupleurum americanum C. & R.	Thoroughwax	Dry open areas to high elevations.	N.R.	N.R.	N.R.
Cardamine pratensis L.	Meadow Bitter Cress	Bogs and swamps	N.R.	N.R.	N.R.
Carex aperta Boott	Open Sedge, Columbia Sedge	Low wet ground; open wetlands	N.R.	N.R.	N.R.

APPENDIX 2 Cont'd

Species	Common Name	Habitat	Canadian Status[2]	Canadian Priority[3]	Alberta Status[4]
Carex crawei Dewey	Crawe's Sedge	Calcareous meadows	N.R.	N.R.	N.R.
Carex deflexa Hornem.	Bent Sedge	Dry open woodland; coniferous woods on the Shield	N.R.	N.R.	N.R.
Carex geyeri Boott	Geyer's Sedge	Open woods and dry mountain slopes	N2	4	S2
Carex glacialis Mack.	Glacier Sedge	Dry calcareous mountain slopes	N.R.	N.R.	N.R.
Carex kelloggii Boott	Kellogg's Sedge	Moist banks and lakeshores	N.R.	N.R.	N.R.
Carex mertensii Prescott	Merten's Sedge	Moist montane woods and streambanks	N.R.	N.R.	N.R.
Carex preslii Steud.	Presl's Sedge	Dry open slopes	N.R.	N.R.	N.R.
Carex scoparia Schk.	Broom Sedge	Moist open woodlands, moderate elevations	N.R.	N.R.	N.R.
Carex vesicaria L.	Blister Sedge	Swamps and marshes	N.R.	N.R.	N.R.
Castilleja hispida Benth.	Rough Red or Harsh Red Indian Paintbrush	Open woods and meadows, up to 1800 m	N.R.	N.R.	N.R.
Ceanothus velutinus Dougl. ex Hook.	Snowbrush, Sticky Laurel, Mountain Balm	Dry woods, shrubby slopes	N.R.	N.R.	N.R.
Cirsium scariosum Nutt.	Thistle	Open woods & slopes.	N2	4	S2
Crataegus douglasii Lindl.	Douglas Hawthorn	Open woods & rocky banks.	N.R.	N.R.	N.R.
Crepis atrabarba Heller	Slender Hawksbeard	Dry, grassy, slopes, moderate elevations	N.R.	N.R.	N.R.
Cypripedium montanum Dougl. ex Lindl.	Mountain Lady's-slipper	Moist woods	N.R.	N.R.	N.R.
Danthonia unispicata (Thurb.) Munro	One-spike Oat Grass	Open ground	N.R.	N.R.	N.R.
Disporum hookeri (Torr.) Britt.	Hooker's Fairy-bells	Moist woods in the mountains	N.R.	N.R.	N.R.
Dryopteris filix-mas (L.) Schott	Male Fern	Wooded slopes	N.R.	N.R.	N.R.
Epilobium saximontanum Hausskn.	Rocky Mountain Willowherb	Moist meadows and streambanks	N.R.	N.R.	N.R.

APPENDIX 2 Cont'd

Species	Common Name	Habitat	Canadian Status[2]	Canadian Priority[3]	Alberta Status[4]
Epilobium halleanum Hausskn.	Hall's Willowherb	Moist ground	N2	4	S1
Epilobium luteum Pursh	Yellow Willowherb, Yellow Fireweed	Moist woods and streambanks in mountains	N.R.	N.R.	N.R.
Erigeron flagellaris Gray	Trailing or Creeping Fleabane	Dry open woods	N.R.	N.R.	N.R.
Erigeron ochroleucus Nutt.	Yellow Alpine Fleabane	Dry hills, scree slopes	N1	4	S1
Erigeron radicatus Hook.	Dwarf Fleabane	Dry ridges, scree slopes	N2	2	S1
Festuca altaica Trin.	Northern Rough Fescue	Open slopes at moderate to high elevations	N.R.	N.R.	N.R.
Festuca occidentalis Hook.	Western Fescue	Dry wooded slopes; associated with Pinus contorta and Populus tremuloides	N.R.	N.R.	N.R.
Festuca subulata Trin.	Bearded Fescue	Moist thickets and shaded banks	N.R.	N.R.	N.R.
Galium bifolium S. Wats.	Two-leaved Bedstraw	Dry, open areas. Often on disturbed sites	N2	4	S1
Geranium erianthum DC.	Wooly Geranium, Northern Cranes-bill	Moist woods and grassy slopes	N.R.	N.R.	N.R.
Glyceria elata (Nash) A.S. Hitchc.	Tall Manna Grass	Streamsides, wet meadows	N.R.	N.R.	N.R.
Gnaphalium microcephalum Nutt.	Tall Cudweed	Dry open sites, often sandy or rocky	N.R.	N.R.	N.R.
Gnaphalium viscosum HBK	Clammy Cudweed	Meadows, openings in woods	N.R.	N.R.	N.R.
Habenaria unalaschensis (Spreng.) S. Wats.	Alaska Bog Orchid, Alaska Rein Orchid	Moist woods and meadows	N.R.	N.R.	N.R.
Habenaria saccata Greene	Slender Bog Orchid	Wet meadows, bogs, along streams	N.R.	N.R.	N.R.
Haplopappus uniflorus (Hook.) T.& G.	One-flowered Iron-plant, One-headed	Dry to moist open slopes, sometimes in disturbed areas	N2T2	4	S2
Hippuris montana Ledeb.	Mountain Mare's-tail	Mossy banks and shallow streams	N.R.	N.R.	N.R.

APPENDIX 2 Cont'd

Species	Common Name	Habitat	Canadian Status[2]	Canadian Priority[3]	Alberta Status[4]
Hydrophyllum capitatum Dougl.	Woolen-breeches	Moist meadows and woods	N.R.	N.R.	N.R.
Hypericum formosum HBK	Western St. John's-wort.	Moist shores and meadows to near timberline	N3	4	S1
Iliamna rivularis (Dougl. ex Hook.) Greene	Mountain Hollyhock	Mountain slopes, meadows and streambanks	N2	4	S1
Juncus nevadensis S. Wats	Nevada Rush	Wet places	N2T1	N.R.	5
Larix occidentalis Nutt.	Western Larch	Moist mountain slopes, moderate to low elevations	N.R.	N.R.	N.R.
Ledum glandulosum Nutt.	Glandular Labrador Tea	Wet meadows and woods	N.R.	N.R.	N.R.
Lesquerella arctica (Wormsk.) S. Wats	Northern Badderpod	Dry calcareous slopes	N.R.	N.R.	N.R.
Lewisia rediviva Pursh	Bitter-root, Spatlum	Dry, southwest exposure, 1700-1800m	N.R.	N.R.	N.R.
Listera caurina Piper	Western Twayblade	Moist coniferous forests	N.R.	N.R.	N.R.
Lithophragma parviflorum (Hook.) T.& G.	Small-flowered Rockstar, Fringe-cup, Prairie-star	Moist meadows and open woods	N.R.	N.R.	N.R.
Lithophragma glabrum Nutt. ex T.& G.	Prairie Rockstar	Meadows & springs, moist slopes.	N.R.	N.R.	N.R.
Lomatium cous (S. Wats.) C. & R.	Biscuit-root	Dry open slopes. Cypress Hills conglomerate.	N1	4	S1
Lonicera utahensis S. Wats.	Red Twin-berry	Moist open woods	N.R.	N.R.	N.R.
Lupinus polyphyllus Lindl.	Large-leaved Lupine	Moist woods	N.R.	N.R.	N.R.
Luzula hitchcockii L. Hamet-Ahti	Hitchcock's Wood Rush	Montane coniferous woodland	N2	4	S1
Melica smithii (Porter) Vasey	Melic Grass	Moist Subalpine woodlands	N.R.	N.R.	N.R.
Melica subulata (Griseb.) Scribn.	Alaska Onion Grass	Moist open coniferous woods	N.R.	N.R.	N.R.
Mertensia longiflora Greene	Large-flowered Lungwort	Moist slopes and meadows	N.R.	N.R.	N.R.

APPENDIX 2 Cont'd

Species	Common Name	Habitat	Canadian Status[2]	Canadian Priority[3]	Alberta Status[4]
Microseris nutans (Geyer) Schultz-Bip.	Nodding Microseris	mesic grassy slopes, open woods, southern mountains to 2300 m	N.R.	N.R.	N.R.
Microsteris gracilis (Hook.) Greene	Microsteris	Moist meadows and thickets	N.R.	N.R.	N.R.
Mimulus guttatus DC.	Yellow Monkey-flower	Stream margins, meadows, springs.	N.R.	N.R.	N.R.
Monotropa hypopitys L.	Pine-sap	Moist woods; saprophytic in coniferous woods	N.R.	N.R.	N.R.
Montia linearis (Dougl.) Greene	Slender-leaved Spring Beauty	Moist to dry sandy places; 1800-2300 m	N.R.	N.R.	N.R.
Montia parvifolia (Moc.) Greene	Small-leaved Spring Beauty	Moist ledges and slopes at higher elevations; 1900-2200 m	N.R.	N.R.	N.R.
Orobanche uniflora L.	One-flowered Cancer-root or Broom-rape	Parasite on plants in moist woods, thickets & grasslands	N.R.	N.R.	N.R.
Oryzopsis exigua Thurb.	Little Rice Grass	Dry open ground or open woods	N.R.	N.R.	N.R.
Osmorhiza chilensis H. & A.	Blunt-fruited Seet Cicely	Woods.	N.R.	N.R.	N.R.
Osmorhiza purpurea (C. & R.) Suksd.	Purple Sweet Cicely	Moist coniferous woods	N.R.	N.R.	N.R.
Pachistima myrsinites (Pursh) Raf.	Mountain Lover, Mountain Boxwood	Mountain woods, thickets & slopes	N.R.	N.R.	N.R.
Penstemon eriantherus Pursh	Crested Beard-tongue	Dry open areas; rocky sites	N3T3	5	S2
Penstemon fruticosus (Pursh) Greene	Shrubby Beardtongue	Rocky slopes and open woods	N.R.	N.R.	N.R.
Phacelia linearis (Pursh) Holz.	Narrow-leaved Scorpion Weed	Dry open slopes and shores	N.R.	N.R.	N.R.
Phegopteris connectilis (Mx.) Fee	Long Beech Fern	Moist woodlands	N.R.	N.R.	N.R.
Philadelphus lewisii Pursh	Mock Orange	Moist mountain woods	N.R.	N.R.	N.R.
Physocarpus malvaceus (Greene) Kuntze	Mallow-leaved Ninebark	Rocky ravines, hillsides & coniferous forest	N1	4	S1
Poa gracillima Vasey	Pacific Bluegrass	Moist woods & meadows; middle & upper elevations	N.R.	N.R.	N.R.

APPENDIX 2 Cont'd

Species	Common Name	Habitat	Canadian Status[2]	Canadian Priority[3]	Alberta Status[4]
Poa stenantha Trin.	Bluegrass, Narrow-flowered Bluegrass	Open woods; often on talus slopes	N.R.	N.R.	N.R.
Polygonum austinae Greene	Austin's Knotweed	Dry banks	N?T1	4	S1
Polygonum engelmannii Greene	Engelmann's Knotweed, Slender Knotweed	Moist banks & slopes at lower Montane elevations	N2	4	S1
Prenanthes sagittata (Gray) A. Nels.	Arrow-leaved Rattlesnake-root	Moist banks and thickets.	N2	3	S2
Primula egaliksensis Wormsk.	Greenland Primrose	Wet meadows and shores	N.R.	N.R.	N.R.
Pteridium aquilinum (L.) Kuhn	Bracken Fern	Dry to mesic woods and thickets	N.R.	N.R.	N.R.
Pterospora andromeda Nutt.	Pine-drops	Lodgepole pine & aspen woods; parasitic on root fungi of conifers.	N.R.	N.R.	N.R.
Puccinellia pauciflora (Presl) Munz	Small-flowered Manna Grass	Wet places	N.R.	N.R.	N.R.
Pyrola picta J.E. Smith	White-veined Wintergreen	Coniferous woods	N.R.	N.R.	N.R.
Ranunculus occidentalis Nutt.	Western Buttercup	Moist mountain meadows	N.R.	N.R.	N.R.
Ribes inerme Rydb	White-stemmed or Mountain Gooseberry	Moist woods, open forests, moderate elevations	N.R.	N.R.	N.R.
Ribes laxiflorum Pursh	Trailing Black Currant	Wet woods	N.R.	N.R.	N.R.
Ribes viscosissimum Pursh	Sticky Currant	Moist mountain woods, streamsides; middle elevations to 2300 m	N.R.	N.R.	N.R.
Rumex paucifolius Nutt.	Alpine Sheep Sorrel	Moist mountain meadows	N2	4	S1
Salix boothii Dorn	Booth Willow	Lakeshores, riverbanks, bogs & meadows	N.R.	N.R.	N.R.
Saussurea americana D.C. Eat.	Tall Saw-wort	Moist meadows; 1675 m	N.R.	N.R.	N.R.
Saxifraga odontoloma Piper		Moist meadows and woods	N.R.	N.R.	N.R.
Saxifraga oregana Howell	Oregon Saxifrage	Moist mountain meadows	N1	5	S1

APPENDIX 2 Cont'd

Species	Common Name	Habitat	Canadian Status[2]	Canadian Priority[3]	Alberta Status[4]
Senecio cymbalarioides Buek.	Alpine Groundsel	Moist alpine meadows & streambanks; 2000-2300 m	N2	5	S1
Senecio hydrophiloides Rydb.	Ragwort	Moist sites in grasslands & open woods.	N2T2	5	S2
Senecio megacephalus Nutt.	Large-flowered ragwort	Open mountain slopes	N2	5	S2
Sorbus sitchensis Roemer	Western Mountain Ash	Moist mountain woods, moderate elevations	N.R.	N.R.	N.R.
Spiraea densiflora Nutt.	Pink Meadowsweet	Moist meadows, thickets and woods; boggy places, 1800-2200 m	N.R.	N.R.	N.R.
Stellaria crispa Cham. & Schlecht.		Moist woods, moderate elevations	N.R.	N.R.	N.R.
Stellaria obtusa Engelm.	Meadow Chickweed	Damp meadows and streambanks	N2	4	S1
Stellaria umbellata Turcz.	Umbellate Chickweed	Moist meadows & streambanks at high elevations	N2	3	S1
Streptopus roseus Michx.	Rose Mandarin, Smaller Twisted Stalk	Moist coniferous forests	N.R.	N.R.	N.R.
Taxus brevifolia Nutt.	Western Yew	Moist woodlands in mountains;mountain ranges W of continental divide	N.R.	N.R.	N.R.
Trisetum canescens Buchl.	Tall Trisetum	Moist woods	N.R.	N.R.	N.R.
Trisetum cernuum Trin.	Nodding Trisetum	Moist woods	N.R.	N.R.	N.R.
Tsuga heterophylla (Raf.) Sarg.	Western Hemlock	Moist coniferous forest, with Picea engelmannii and Abies lasiocarpa. Moderate elevations. Shade tolerant.	N.R.	N.R.	N.R.
Vaccinium ovalifolium J.E. Smith	Tall Huckleberry, Oval-leaved Huckleberry	Moist thickets and woods	N.R.	N.R.	N.R.
Viola glabella Nutt.	Yellow Mountain Violet	Moist woods & streambanks in the mountains	N.R.	N.R.	N.R.
Viola macloskeyi Lloyd	MacLoskey's Violet	Boggy or wet ground & wet thickets	N.R.	N.R.	N.R.
Viola selkirkii Pursh	Great-spurred Violet	Moist woods	N.R.	N.R.	N.R.

APPENDIX 2 Cont'd

1. Sources: Argus, G.W. and K.M. Pryer, 1990. Rare Vascular Plants in Canada. Canadian Museum of Nature, Ottawa.
   Wallis, C., C. Bradley, M. Fairbarns and V. Loewen, 1987. The rare flora of Alberta. Volume 3, Alberta Forestry, Lands and Wildlife.

2. National rating ranges from N1, critically imperiled because of extreme rarity (5 or fewer occurrences), to N5, abundant and demonstrably secure. N.R. = Not Rated.

3. Priority ratings range from 1 (highest) to 5 (lowest). N.R. = uncommon but not numerically rated in Argus and Pryer (1990).

4. Sub-national rating ranges from S1, critically imperiled because of extreme rarity (5 or fewer occurrences), to S5, abundant and demonstrably secure. N.R. = not rated. Not all plants are rated because of insufficient information due to financial and scientific constraints.

Appendix C

Geotechnical and Groundwater Analysis

1. Letter report from Thurber Consultants relative to geotechnical recommendations for the Square Butte Ranches Development Plan.

2. Summary of the 1990 Preliminary Geotechnical and Groundwater Analysis prepared by Thurber Consultants Ltd.

THURBER CONSULTANTS LTD.
SUITE 110, 7710 - 5 STREET S.E., CALGARY, ALBERTA T2H 2L9
PHONE (403) 253-9217 FAX (403) 252-8159

November 10, 1994 File: 19-199-3

Kyllo Planning and Development Ltd.
155 Millrise Drive S.W.
Calgary, Alberta
T2Y 2G3

Attention: Mr. Leo Kyllo

GEOTECHNICAL REVIEW
SQUARE BUTTE RANCHES LIMITED
PROPOSED REDESIGNATION

Dear Sir:

As requested, Thurber Consultants Ltd. has carried out a geotechnical review of the proposed Mini-Ranch layout for Square Butte Ranches. The purpose of the review was to assess the applicability of existing geotechnical data obtained in 1989 to the currently proposed development, and to identify areas where additional geotechnical data are required for detailed design.

Proposed Dam Site and Borrow Source

The new site of the proposed earth fill dam had not been investigated previously. Therefore, a minimum of 3 test holes, each to about 10 m depth should be drilled along the proposed dam centreline, to provide the necessary data for the design of the dam foundation and embankment section.

The potential source of borrow material for dam construction is located approximately 50 to 100 m north of the dam site. At least 2 test holes, each to about 5 m depth, should be drilled in this area to confirm the suitability and to establish soil parameters for the proposed borrow source.

Proposed Village Area

The proposed village has been relocated, hence the previously drilled test holes do not cover this area. We understand that the development in the village area will consist of a number of relatively small, one or two storey buildings. Therefore, specific test holes at each proposed building site are not required, however, a minimum of two test holes, each to a depth of about 8 m should be drilled within the proposed village area to establish foundation design parameters for these structures.

Proposed North Cottage Lots

The previously obtained test hole and test pit data are considered to be sufficient for the design of foundations for cottages in this area, and the previously provided recommendations remain applicable. However, as these lots are developed, the foundation excavations should be inspected by geotechnical personnel to confirm foundation conditions.

Proposed South Cottage Lots

No test hole or test pit data are currently available in the area of the south cottage lots. However, development of these lots could proceed without prior drilling or test pitting, provided that the foundation excavations are inspected by geotechnical personnel to confirm foundation conditions.

Roads

We understand that the currently proposed road layout will involve relatively minor cuts of 1 to 2 m depth. Accordingly, the previously provided recommendations for road cuts and fills remain applicable, and no further geotechnical investigation is required for the design of the proposed roads.

Sewage Disposal

We understand that sewage disposal is proposed to be handled by mounded septic fields. The design of the tile disposal beds should be undertaken in conjunction with geotechnical input. It is anticipated that 4 to 5 grain size analyses and a similar number of laboratory permeability tests, as well as some percolation tests during initial construction, may be required.

Closure

We trust that these comments and recommendations meet your present requirements. Should you have any questions, or if we may of further assistance, please call the undersigned at your convenience.

Yours truly,
THURBER CONSULTANTS LTD.
H.S. Crawford, P.Eng.
Review Principal

H.S. Crawford.
Feb 2/95.

N. Hernadi
Sr. Project Engineer

PERMIT TO PRACTICE
THURBER CONSULTANTS LTD.
Signature H.S. Crawford
Date February 2, 1995
PERMIT NUMBER
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

NH/wu(A)

Summary
Preliminary Geotechnical and Groundwater Analysis
Thurber Consultants Ltd. 1990

A detailed geotechnical and groundwater investigation was undertaken in the fall of 1989 and early 1990. The objectives of the analysis were to :

- identify major geotechnical constraints with respect to development of the site for the proposed purposes;

- present geotechnical recommendations for the preliminary design of facilities and services;

- determine the potential quantity and suitability of ground water on the site to provide adequate potable water supply for the development.

This information summarizes a more detailed and technical geotechnical and ground water evaluation prepared by Thurber Consultants Ltd. These investigations were undertaken for general site areas which were identified as potential locations for the ranch facilities. The areal extent of the site is large and building locations were not totally fixed prior to the analysis. This resulted in the study being general rather than site specific and the location of many of the structures has changed. Also, there has been a significant reduction in the size and type of buildings which will result in less stringent foundation requirements. Further, the desire was to destroy as little tree cover as possible during the investigations. This led to an approach of determining the general suitability of those areas for the developments proposed. It was understood that more specific analysis would be required once individual building, roadway, and utility sites have been determined.

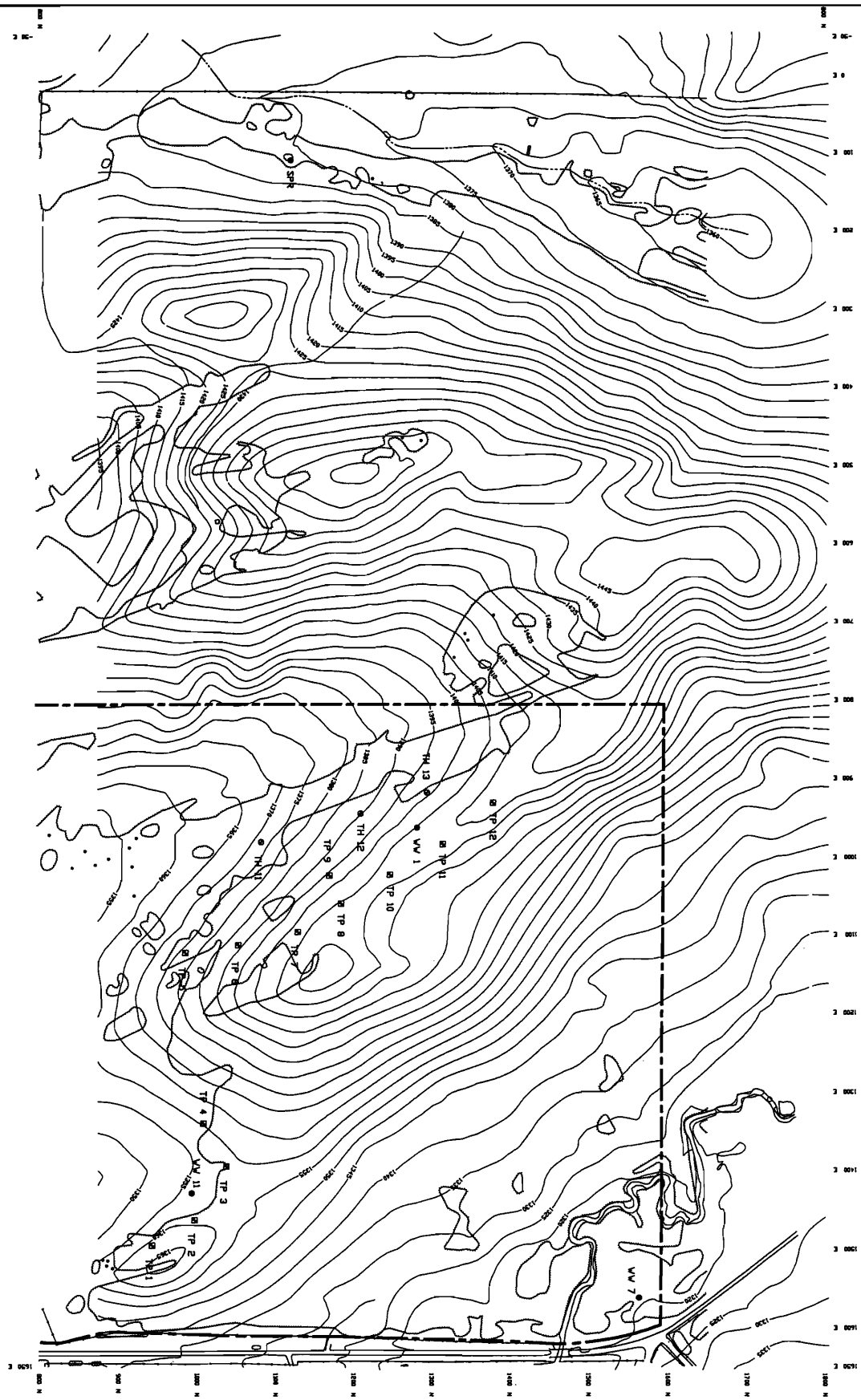
In order to confirm the suitability of the existing geotechnical information and identify additional data requirements, a review was requested of Thurber Consultants Ltd. That review is contained in the appendix and confirms that the site is suitable for the proposed uses from a geotechnical perspective, given proper design and in keeping with ongoing geotechnical advice. A program for additional soils testing has been recommended and the conditions and requirements from the earlier report have been continued. These are discussed below.

The locations of the previous subsurface test sites are shown on the Geotechnical/Ground water Test Locations plan. The methods used for the 1989 investigation included the following:

- data review and aerial photograph analysis;

- field reconnaissance;

- field exploration by test pitting (24) with a backhoe to a depth of 10 feet (3.0 metres) or solid bedrock. These pits were field logged, pocket penetrometer tested carried out in cohesive soils and soil samples taken. The pits were then backfilled;



B.M. Potter Consultants Ltd.

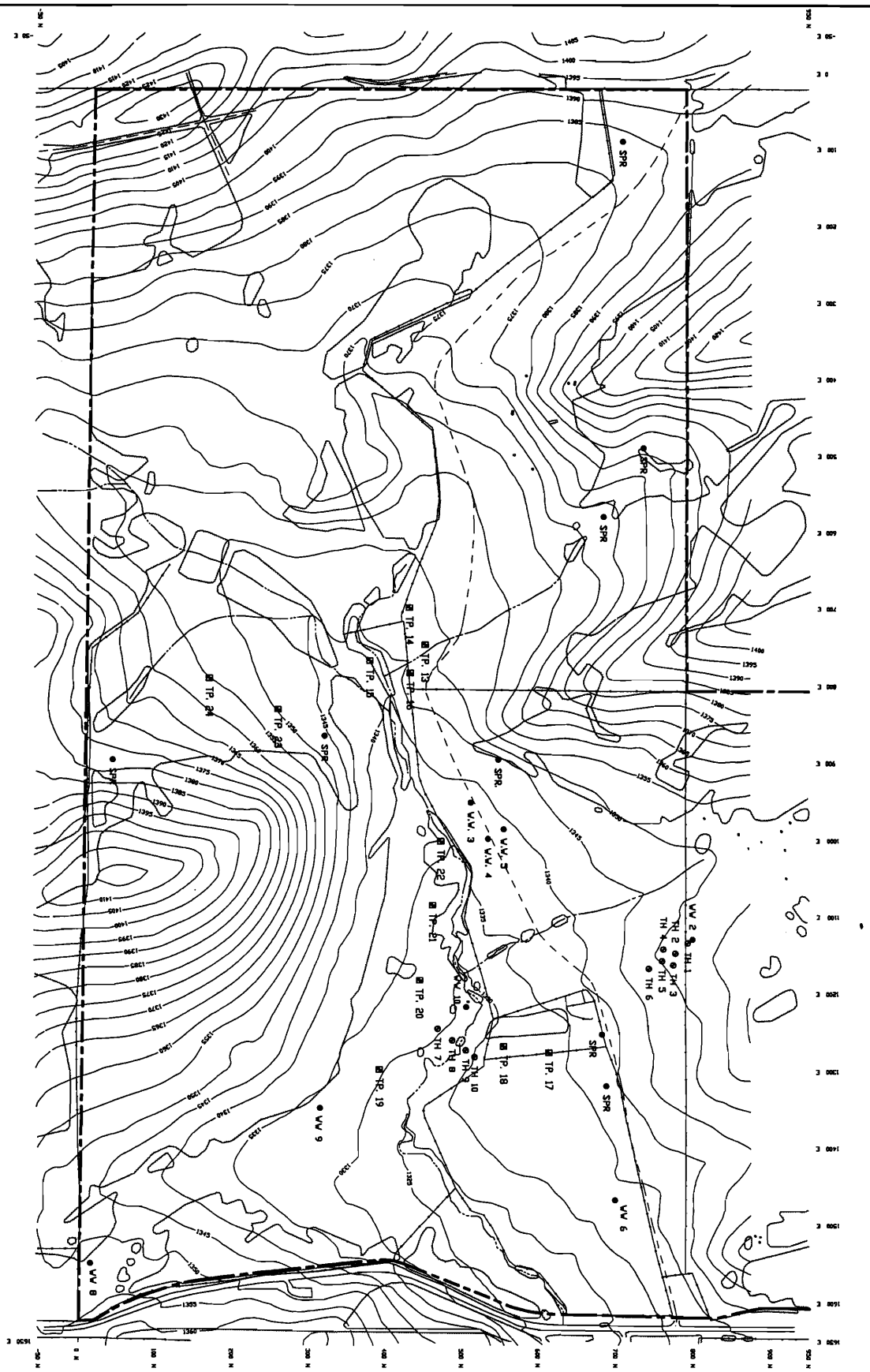
DRAWN: G.S. BRIGGS	DATE: 12.03.94	
APPROVED: B.M. POTTER	SCALE:	
DESIGNED: B.M. POTTER	JOB No.: 288-004	

DRAWING No. NP-5

GEOTECHNICAL AND GROUNDWATER TEST LOCATIONS – NORTH

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1	12.03.94	PRELIMINARY	BP



B.M. Potter Consultants Ltd.

GEOTECHNICAL AND GROUNDWATER TEST LOCATIONS – SOUTH

DRAWN: C.S. BRIGGS	DATE: 12.03.94
APPROVED: B.M. POTTER	SCALE:
DESIGNED: B.M. POTTER	JOB No.: 266-004

DWG No. SG-5

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1	12.03.94	PRELIMINARY	BP

- field exploration by test holes (13) using an auger rig to depths of 10 feet (3.0 metres) for percolation tests, 15 feet (4.6 metres), 20 feet (6.1 metres), and 30 feet (9.1 metres) for foundation tests. The holes were field logged. tested for standard penetration, pocket penetrometer tests carried out in cohesive soils, soil samples taken, and standpipe piezometers installed in six holes. The test holes were then backfilled;

- standard percolation tests were conducted for four test holes in the vicinity of the earlier ranch centre site and the north cabin cluster;

- laboratory testing was conducted on soil samples to classify them, determine moisture contents, and to establish soluble sulphate content;

- a geotechnical evaluation report was prepared identifying site potential and limitation and presenting design and development recommendations;

- three water wells and two observation wells were drilled using a rotary rig. One water well was completed for production and two were completed as observation wells. The other two were backfilled. During 1990 and 1991, an additional five wells were drilled;

- one water well was production tested for 72 hours and the water levels in the observation wells, the nearby spring, and one water well in SE quarter of Section 8-21-4-W5 were routinely measured;

- a calculation of the twenty year safe yield was completed for the water test well.

As noted before, the dominant geological and topographic features of the site are the razorback ridges breached by the central valley.

Surficial soils are composed of a glacial till blanket or veneer overlying bedrock on the upper slopes. These soils are primarily clays and silty clays with some silt and gravel. Soils at the intermediate elevations are generally clays originating from a glacial lake (glaciolacustrine). The lower valleys have fine clays, also of glaciolacustrine origin.

Bedrock on the site consists of faulted and folded sandstones and shales. The shales are generally dark grey, fissured, and of marine origin interlain with thin layers of fine grained glauconitic sandstone. The bedrock is severely upthrust lying at near vertical to dipping to the west at approximately 45 degrees. Three fault lines running northwest to southeast have resulted in the three dominant razorback ridges on the site. These ridges have been breached on the site by a fourth fault running nearly east/west which has resulted in the central valley.

Three major soil composition units are present on the site including lacustrine (water) deposits, till (glacier carried and mixed clays and gravels), and colluvium (weathered bedrock) deposits and bedrock.

However, the transition between these is gradual rather than distinct.

The entire site was previously glaciated but the last major glaciation from the Canadian Shield did not extend this far west. The ice front stood a short distance to the east in the Millarville area and impounded a series of glacial lakes in the stream valleys of Three Point, Mesa, and Fisher Creeks. These valley floors were covered by varying thicknesses of glacial silt and clay into which the streams cut after the retreat of the ice. This glaciolacustrine deposition has resulted in the establishment of terraces, benches, and plains of fine clay, which is in some areas of substantial thickness. Stream processes and erosion have cut through these or modified them establishing more recent valleys but also laying down new water carried and sorted (fluvial) deposits of gravels, sands, silts, and clays.

The higher elevations of the valleys, which were not covered by lacustrine deposits, are covered by till materials left by previous glaciation and by colluvial soils formed directly from bedrock. These older deposits are also found beneath the lacustrine deposits. The tills and colluvium are mixed materials including clays, silts, sands, gravels, and boulders, and do not show the fine grain nor the layering that lacustrine deposits typically exhibit. While often not thought of as a soil, bedrock is present with little cover and in a condition which makes it a medium for plant growth. It is therefore included in this soil group.

Lacustrine materials originating from both glacial action and more recent stream processes are present at the lower elevations on-site. Recent fluvio-lacustrine materials up to six feet (2 metres) in depth were encountered within the immediate vicinity of the existing stream course and consisted of dark grey to yellow brown, moist to wet, high plastic clays and organic clays. Organic materials consisting of roots, rootlets, and finely divided unspecified organic materials comprised as much as 50 percent of these materials by volume. These deposits were found to be very soft and the material sloughed in the test pits. Moisture contents in the materials ranged from 25 percent to 28 percent, with the higher values associated with increased fibrous organic content.

A glaciolacustrine blanket extending from ground surface to a depth of three feet to six feet (1 metre to 2 metres) was encountered in Test Holes 3, 5, and 6 at the proposed ranch centre site, and in Test Pits 19 through 22 near the south cabin cluster. This material consisted of horizontally-laminated dark grey and yellow, high plastic clay. Moisture contents in this material ranged from 25 percent to 45 percent and were typically 10 percent higher than the colluvial and till materials encountered at depth.

Colluvial and till materials were encountered at all test locations except in Test Pits 4, 20, and 21. Both materials are composed of a heterogeneous mixture of silt to cobble size materials in a dark brown to dark grey, medium to high plastic clay matrix.

The principle distinction between the two materials is a somewhat coarser and more angular particle size in the colluvium as well as occasional, isolated, finely-divided organic inclusions within the colluvial matrix. From an engineering point of view, these materials are expected to behave similarly and they have therefore been grouped as a single soil unit.

Moisture contents in these materials ranged from 10 percent to 29 percent with an average of 15 percent and were relatively constant with depth. Atterberg Limit tests conducted on two samples indicated a plastic limit of 18 percent and a liquid limit of 43 percent. These results indicate that the material is within the medium plastic designation of the Modified Unified Soil Classification System.

Standard penetration test blow counts in this unit ranged from 23 to 55 with an average of 32 blows per twelve inches (300 mm) which indicates a very stiff to hard consistency.

Comparison of the Atterberg Limit test results and the moisture content profile shows that the insitu moisture content is approximately 3 percent below the plastic limit, which indicates that the material is over consolidated.

The medium to high plastic clays on the site are subject to both shrinkage and swelling with changing moisture content. In this case there is a high potential for swelling due to the relatively low natural moisture content.

Bedrock, consisting of black shales and dark grey to brown sandstones, was encountered in Test Pits 1 through 3, 5 through 12, and in Test Holes 11, 12, and 13. The bedrock material was generally weathered, and may be described as soft with respect to bedrock strength.

Due to the method of exploration, the strike and dip of the bedrock material could not be accurately measured. However, the bedrock bedding was steeply dipping to the west at an approximate angle of 60 degrees to the horizontal. The strike of the beds was approximately parallel to the top of the ridge.

Ground water conditions near the surface were also investigated. The data review, site reconnaissance, and field investigations indicate that the lower elevation of the valleys at the site are ground water discharge areas. A total of five springs are known to exist in the development area and are noted on the Geotechnical/Ground water Test Locations plan. Other springs are present outside the project boundaries. The ground water supply investigation indicates that these springs are the result of bedrock-controlled artesian flows from some depth.
At the time of drilling, all the test pits and bore-holes were dry except Test Pits 13 and 14. Observations of three piezometers in the bore-holes three days later showed them to be dry. In Test Pit 13, flowing water was encountered along a layer of boulders and cobbles at a depth of five feet (1.6 metres). Minor seepage was encountered at a depth of 7.5 feet (2.3 metres) in Test Pit 14.

Appendix D

Historical and Archaeological Analysis

Summary of the 1990 Historical Resources Impact Assessment prepared by Aresco Ltd.

During the fall of 1989, a Historical Resources Impact Assessment was conducted on the subject property under a permit issued by Alberta Culture. A report has been submitted to the Provincial authorities and is summarized herein. In keeping with the requirements of the legislation, the intent of this investigation was to:

- determine if historical resources were present in the area;
- evaluate the significance of any such resources;
- evaluate the impact of construction on any resources; and,
- report on the findings and make recommendations for procedures to mitigate any adverse impacts.

The methods used to conduct the investigation included the following:

- research into previously recorded archaeological and historical sites in the vicinity;
- analysis of historical records and studies relevant to the area;
- archival research at the Glenbow Museum, University of Calgary, and Southern Alberta Land Titles Office;
- an analysis of recent and historical aerial photographs of the area;
- traversing the area on foot and examining surface conditions and exposed soils;
- shovel testing (12) of shallow soil deposits in areas which may be expected to produce cultural remains, such as ridge crests;
- backhoe excavation tests (15) in areas of deeper deposits where sediment traps were likely or where buried *fossil soils* might be found;
- collecting samples of cultural materials found and recording these;
- analysis of the data and preparation of the report and recommendations.

Native occupation of the foothills region south and west of Calgary extends back over 10 000 years to the closing millennia of the last ice age, a time when the landscape and vegetation were considerably different from today.

Early types of spear points have been found in the valleys northwest of Turner Valley in association with animal bones eroding out of spring heads suggesting the lands were used as seasonal hunting grounds. This pattern of seasonal use extends into the last Century when the lands were frequented by the Peigan, Kootenai, and Stoney Indian tribes on a seasonal basis.

The larger campsites of the ancestral Peigan and Kootenai people, who have occupied the foothills region for thousands of years, are located along the larger streams and rivers. Smaller hunting campsites and kills are situated on tributary streams and other kinds of sites associated with spiritual activities on high ridges and prominent points. A well developed and utilized Native trail system connected the camps and hunting, trapping, and special use areas in to the overall settlement and land-use system of the foothills and front ranges of the Highwood-Sheep-Elbow system.

The evidence encountered in this study indicates that the subject site was likely hunted into but was not occupied for any length of time. It is likely that the Fisher Creek and Three Point Creek valleys with permanent water supplies were more often used for camps. Also, the valley east of Coalmine Hill, parallel to Secondary Road 762, was likely a travel corridor between the Sheep and Elbow and Bow Rivers. Further, focal points such as Mesa Butte were likely used as travel landmarks and would have attracted more regular occupation.

The first whiteman recorded to have visited this area was explorer, fur-trader, and cartographer David Thompson of the Hudson's Bay Company. He wintered with the Peigan Indians west of present day Calgary in 1787 and returned to the Highwood area in 1800. Another early explorer, Peter Fidler, arrived in 1792. Other Hudson's Bay and Northwest Company fur-traders, prospectors, and traders from Montana were occasional visitors in the vicinity throughout the 1800's until the arrival of settlers later in the century. Early missionaries in the area included Robert Rundle (1840), John McDougall (1873), Albert Lacombe (1860's, 1880), Constantine Scollen (1870's), and Leon Doucet (1870's).

The Palliser Expedition of 1857/58 documented the physical features and resources of the southern Canadian plains and explored the foothills and Rocky Mountains. The subject area was included in those explorations.

Prior to 1869, all the land in the Northwest Territories of Canada was controlled by the fur-trading companies. They exercised their own regulations and controlled settlement. In 1869, the Hudson's Bay Company transferred control of this land to the Dominion of Canada but no law enforcement authority was provided to supplement the former Hudson's Bay control. This allowed the whiskey trade to flourish in Southern Alberta until the arrival of the Northwest Mounted Police in 1874. Several whiskey posts were established in the region south of the Bow river including locations on the Elbow River, north from the site, and on the Sheep River to the south.

Following the establishment of Fort Calgary in 1875, police outposts were then established to occupy the area. The earliest were Pekisko (1886), High River (1887), Dunbow (1888), Millarville (1888), Fish Creek (1890), Ings (1890), and Okotoks (1892). The Millarville outpost, established after the area had a sufficient number of settlers to warrant a local presence, was a facility rented from settlers along the north bank of Three Point Creek.

The *golden age of ranching* in southern Alberta lasted only a short time from 1869, when land was made available, until the arrival of the railway in 1883 which brought in settlers migrating west. In this short period, major cattle ranching operations, including Cochrane, Burns, and Bar U Ranches flourished. The Cochrane Ranch had a *cow camp* north from the subject site along the Elbow River near present day Bragg Creek. As the area was all open range, it is likely that livestock from several ranches frequented the area. However, the large ranches, operating on grazing leases, were doomed once Western Canada was opened for homesteading and the railway provided for transport of settlers.

The first settler in the area was Charles Priddis, who wintered along Fish Creek in 1881, followed by the Fisher Brothers, who arrived at the present day Millarville about 1885. The major influx of settlers began in the mid to late 1880's. However, the township which contains the subject site was on the western margin of the settlement area and was late to be taken into private title.

The early township survey plan in the area was compiled by Wilkins in 1894 but shows only a wagon trail leading to Calgary located north of Three Point Creek. No settlement features were shown for sections 17 and 20. By 1908, a second edition also showed no further development on the site but the wagon trail to Calgary had been supplemented with another trail east of Coalmine Hill leading to Bragg Creek. Another trail led up Fisher Creek to just east of the subject site. These trails signify the increasing settlement in the area.

As the district matured, schools, churches, halls, and stores were built. The early social life often revolved around such sporting events and activities as horse racing, polo. tennis, and cricket. Farming was extended beyond the cattle and horses to raise other livestock and feed crops. Irrigation was used extensively in the early 1890's but was generally abandoned by 1914.

Several logging and milling operations were set up; coal mining began at Priddis in 1883 and seems to have been on the Sheep by 1890. Coal was also mined on the east side of Coalmine Hill, 1.5 miles (2.4 kilometres) east of the subject site.

Various railroads were proposed for the area and construction started on one of them. A railway grade is still visible at Millarville. Oil was brought in at Turner Valley in 1914, although the major boom occurred more than 20 years later.

The first recorded settlement on the subject site was the homestead of Sam Virtue on the NE quarter of Section 17. A log cabin and associated buildings were located on a bench just north of the spring on the north side of the central valley. However, there seems to be some mystery as to the legal ownership of the land as it was never recorded as being under Virtue's ownership. While Virtue settled on the land in 1915 and remained until 1928, the land was later included in the Veterans Settlement program following the First World War. It was patented by John Bell at a later date.

Although Billy Trevenan built on SW 20 in 1919, a grant for this land and SE 20 was not issued until 1926. Buildings, including a log house, barn, and corrals, were located adjacent to the north boundary of the Square Butte Ranches site on the east side of the valley leading north to Fisher Creek.

NW 17 and SE 20 were granted to Joseph Bell in 1918 and the Soldier Settlement Board in 1926, respectively. Sam Virtue had been farming the latter quarter since 1919, and subsequently transferred it to John Bell. SE 20 was purchased from Trevenan.

During the difficult times of the depression years of the thirties, along with the realization that more land than one quarter section was needed to survive as a farmer or a rancher, many homesteads were given up or sold. Also, the 1940's brought on the oil boom of Turner Valley and many settlers were attracted to this industry. Those who remained often acquired substantial land holdings, as John Bell had, and were able to ranch at a scale which was viable. The Bell family sold the land in the vicinity to the Glaister family in 1969, a few years after the death of Mrs. Bell.

A total of eight archaeological sites were discovered on the subject property during the investigation. Four of these are prehistoric in age, four were from the historic period, and one contained materials relating to both areas. All of these sites have been disturbed by cultivation, erosion, or early construction. None revealed any significant density of cultural material and are only of local value. Only one, the Virtue Homestead, has been recommended for any further work or attention. However, the information assembled may provide for a prehistoric/historic interpretive program for the Square Butte Ranches patrons.

A brief description of each site follows. The location of each site is shown on the Historical Resources Site and Test Location Plan. Because the initial investigation also involved SW 20, the sites on this property are also shown.

Site Number EePp 6 Native Terrace Campsite

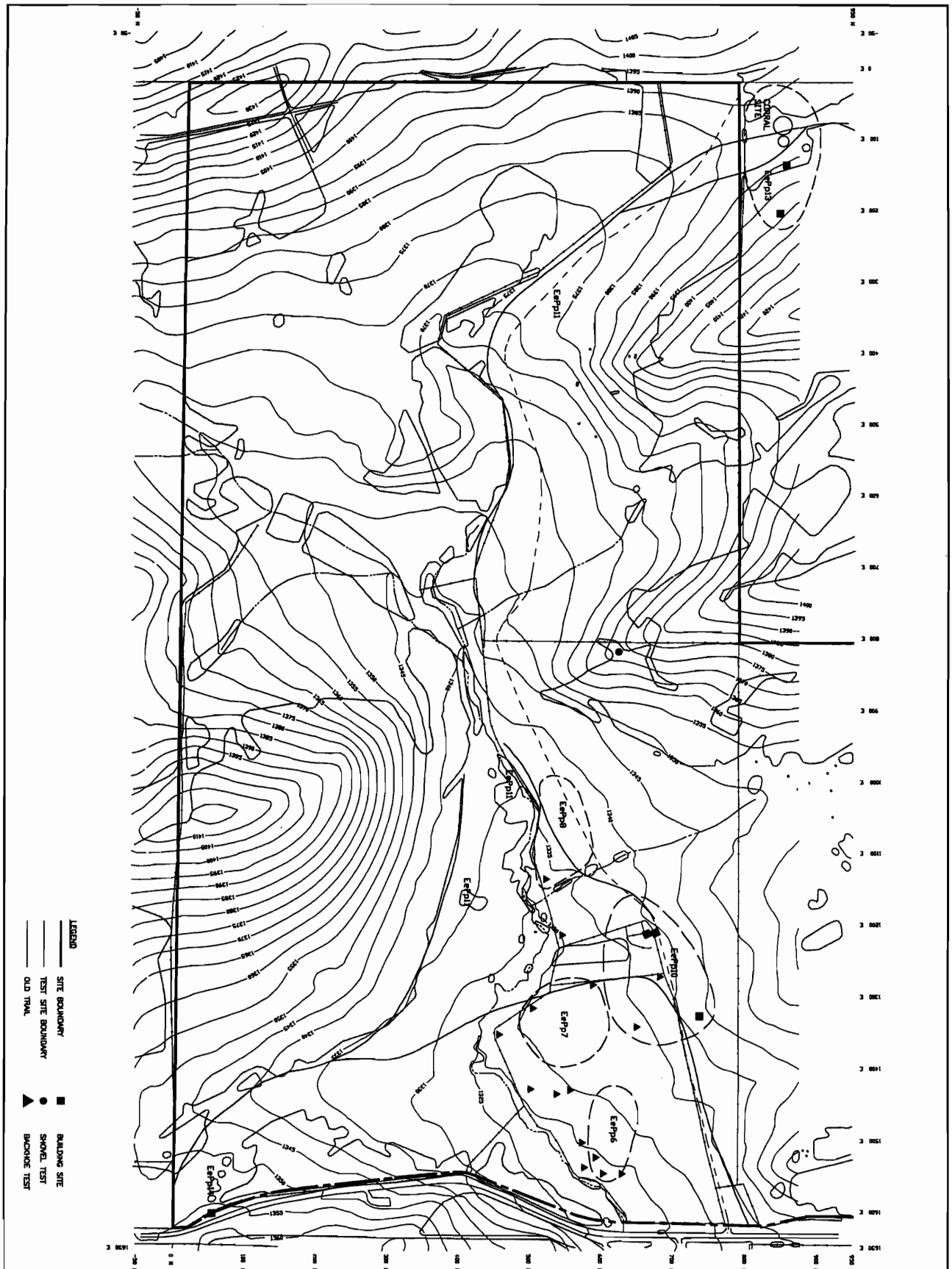
Very light scatter of occasional firecracked rock and bone fragments exposed in plowed field situated on stream terrace of intermittent Creek. Backhoe testing found no evidence of buried deposits. Plow zone is underlain by glacial lacustrine clays.

Site Number EePp 7 Native Terrace Campsite

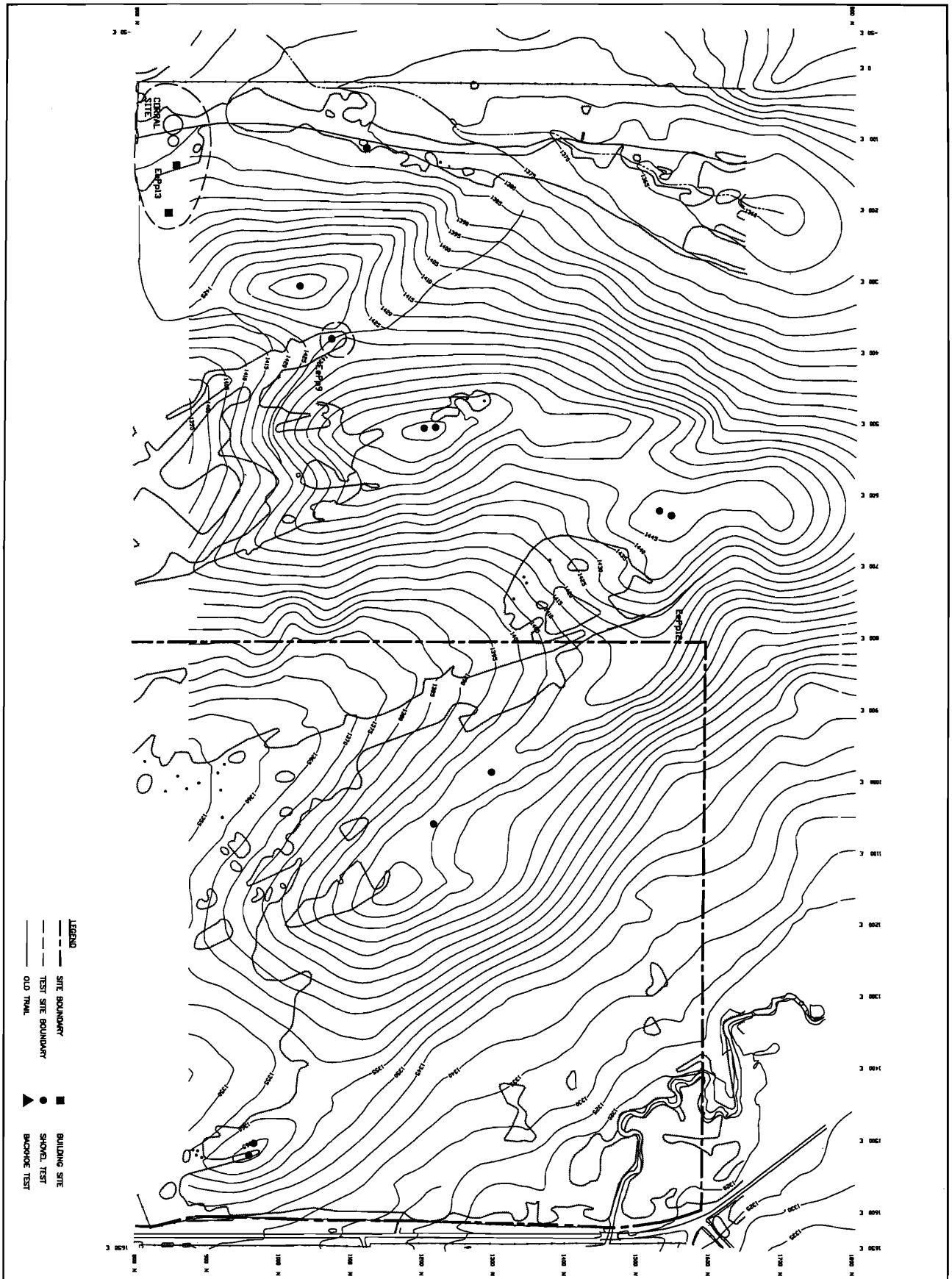
Very light scatter of occasional firecracked rock and bone fragments exposed in plowed field situated on intermittent stream terrace, at bend south of corral. Backhoe testing found no evidence of buried deposits. Plow zone is underlain by glacial lacustrine clays.

Site Number EePp 8 Native Terrace Campsite

Very light scatter of occasional firecracked rock and bone fragments exposed in plowed field situated on intermittent stream terrace, at bend west of corral. Backhoe testing found no evidence of buried deposits. Plow zone is underlain by glacial lacustrine clays.



B.M. Potter Consultants Ltd.	DRAWN G.S. BRIGGS	DATE 12.03.94			MINI-RANCH DEVELOPMENT for SQUARE BUTTE RANCHES MILLARVILLE ALBERTA		
	APPROVED B.M. POTTER	SCALE					
SP-9 HISTORICAL RESOURCES – SOUTH SITE & TEST LOCATIONS	DESIGNED B.M. POTTER	JOB No. 265-004				1 12.03.94 PRELIMINARY BP	
						No. DATE REVISIONS BY	



B.M. Potter Consultants Ltd.

DRAWN G.S. BRIGGS	DATE 12.03.94	
APPROVED B.M. POTTER	SCALE	
DESIGNED B.M. POTTER	JOB No. 268-004	

FIG. No. 6

HISTORICAL RESOURCES – NORTH
SITE & TEST LOCATIONS

MINI-RANCH DEVELOPMENT
for
SQUARE BUTTE RANCHES
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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Site Number EePp 10 White Homestead

Location of farm buildings of Sam Virtue, on a bench north of a major spring on the north side of the intermittent stream. Consists of small house over the spring and a scatter of refuse along the hillside to the north, and on a wagon road on the hillside above. A log cabin and other buildings lay on a bench north of the road, and were removed many years ago. Some additional examination of this site will be undertaken in early 1995.

Site Number EePp 11 White Trails Complex

Location of various trails running through the property believed to be associated with early farm occupancy and logging operations. Consists of the eroded ruts of an old wagon road running from the SE corner of NE 17, north to cross tributary of Fisher Creek, to the NE corner of NE 17. North of the creek, a branch rends West to the SW corner of SW 20 from where it rends North to Fisher Creek.

Site Number EePp 14 White Building Site

This building site was indicated on the NTS map 82J/15E ed.1 ASR (1940), however, no aerial photographic field evidence was discovered. The site appears to have been destroyed by road construction.

On the adjacent SW 20, a primitive tipi ring (EePp 9) and a wagon road/power line (EePp 12) were located. The latter also yielded a stone chopper of native origin. The site EePp 13 is the location of the Trevenan homestead of which the remnants of the cabin are intact, but the corrals and barn have been virtually destroyed.

Appendix E

Internal Road Design

DEVELOPMENT ROAD NETWORK

FOR

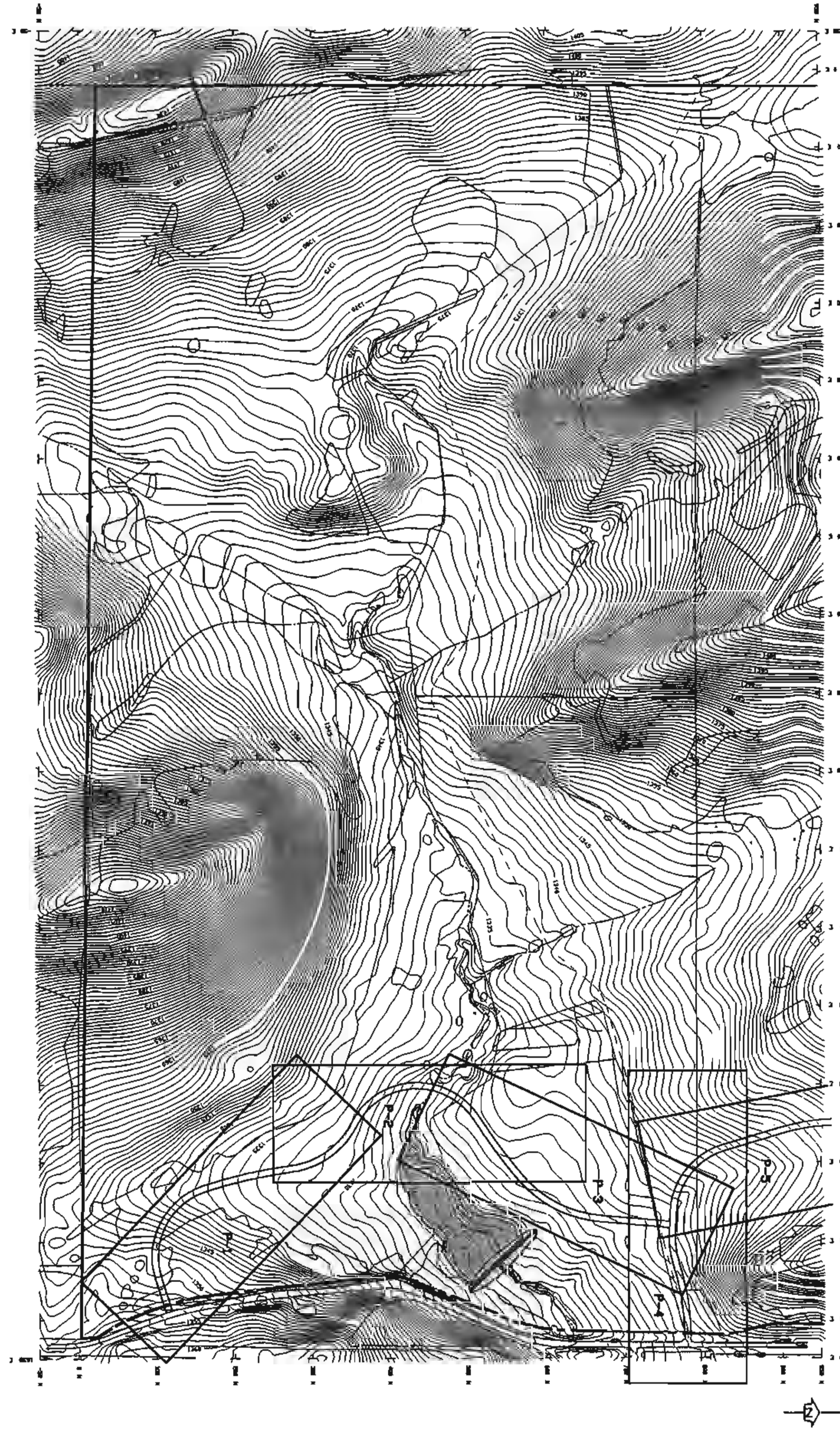
SQUARE BUTTE RANCH

MILLARVILLE ALBERTA

PRELIMINARY ONLY

LIST OF DRAWINGS

B.M. Potter Consultants Ltd.



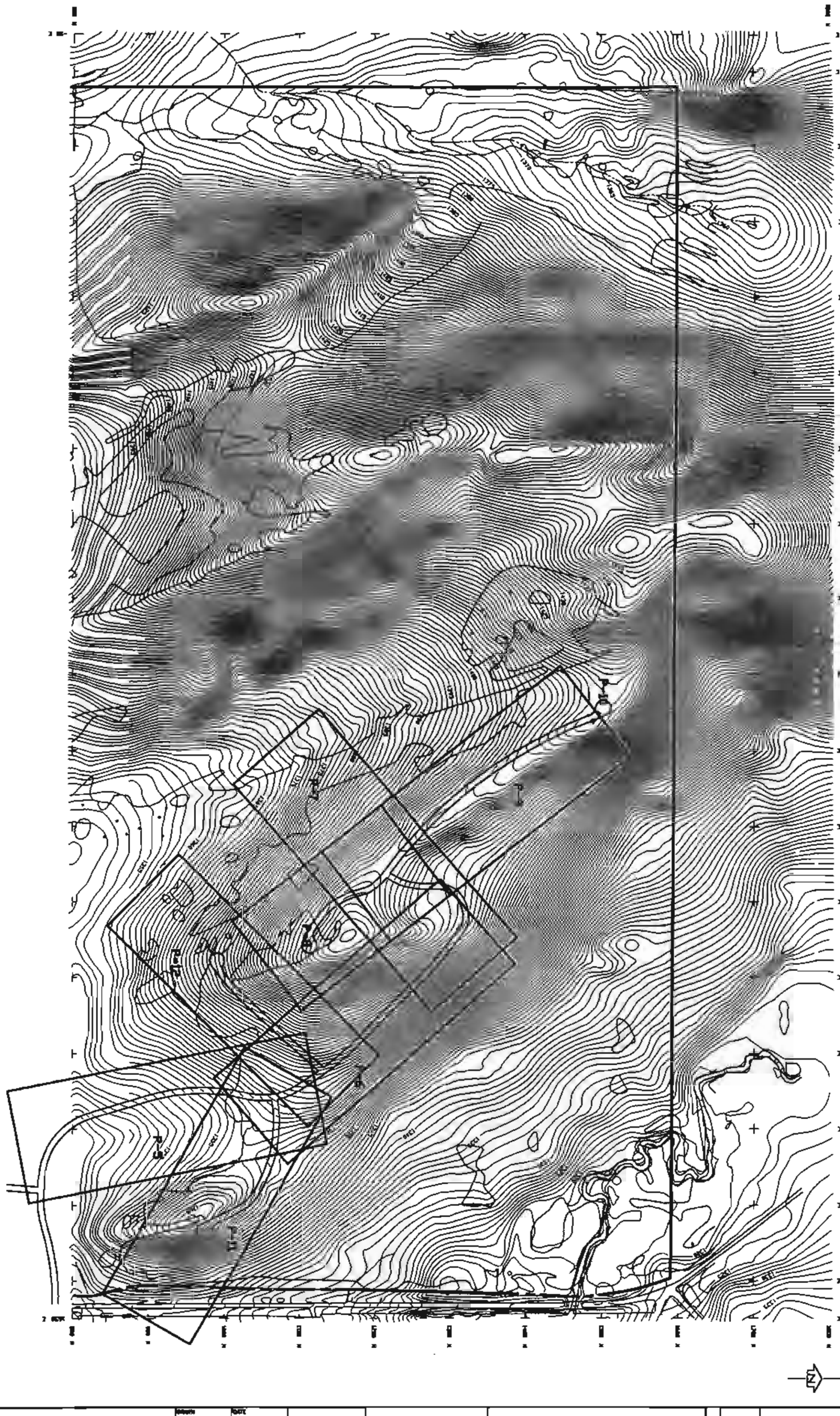
B.M. Potter Consultants Ltd.

APPROVED B.M. POTTER	SCALE

SITE PLAN – SOUTH
ROAD ALIGNMENT

DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1		PRELIMINARY	



B.M. Potter Consultants Ltd.

APPROVED: B.M. POTTER

DESIGNED: L.J. COUGHLIN

SITE PLAN – NORTH ROAD ALIGNMENT

KP–2

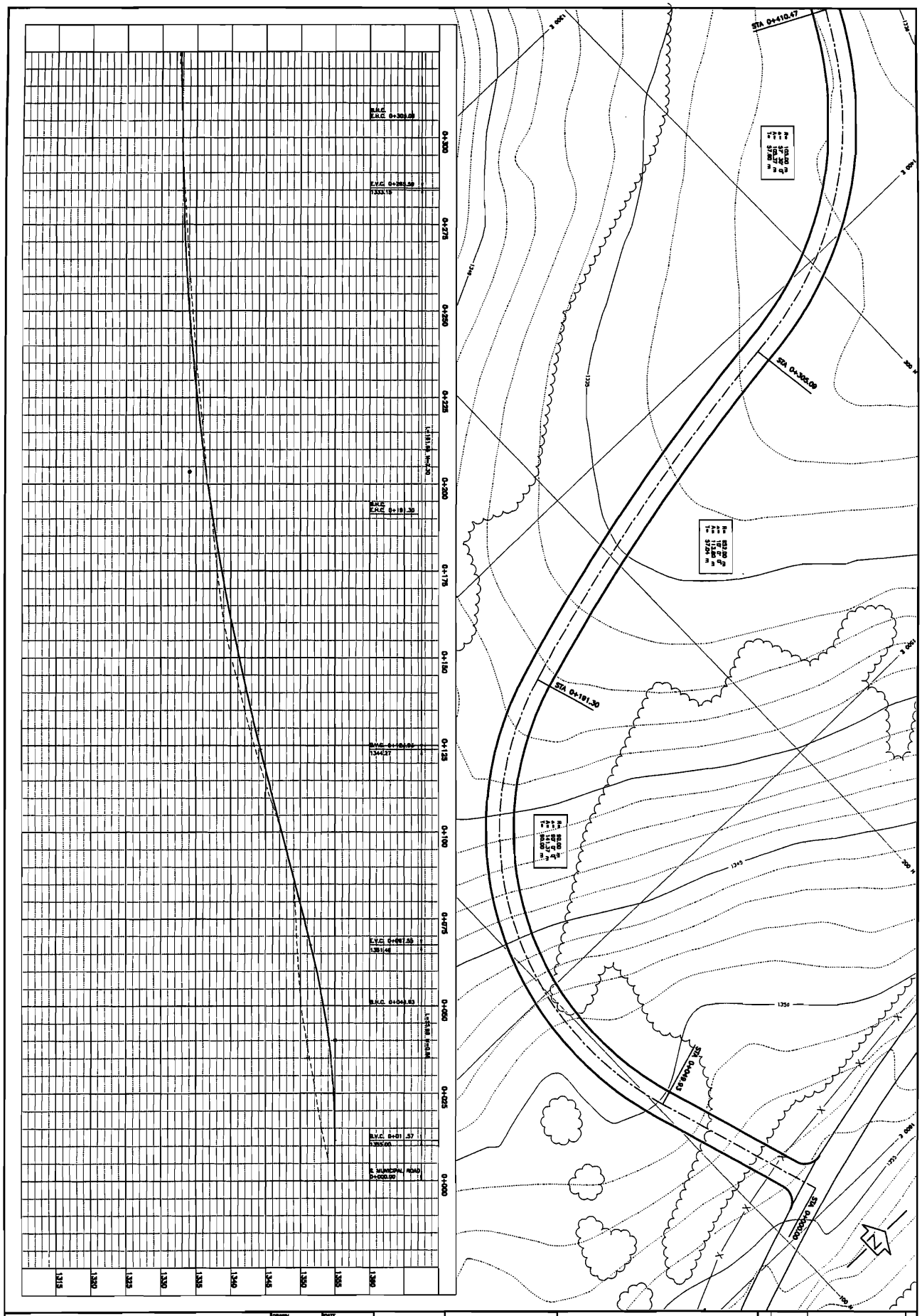
DEVELOPMENT ROAD NETWORK

for

SQUARE BUTTE RANCH

MILLARVILLE ALBERTA

1 PRELIMINARY



B.M. Potter Consultants Ltd.

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APPROVED: B.M. POTTER	SCALE:	
DESIGNED: L.J. COUGHLIN	JOB No.: 266-004	

DWG. No. P1-1

ACCESS ROAD
STA. 0+000.00 TO 0+300.00

DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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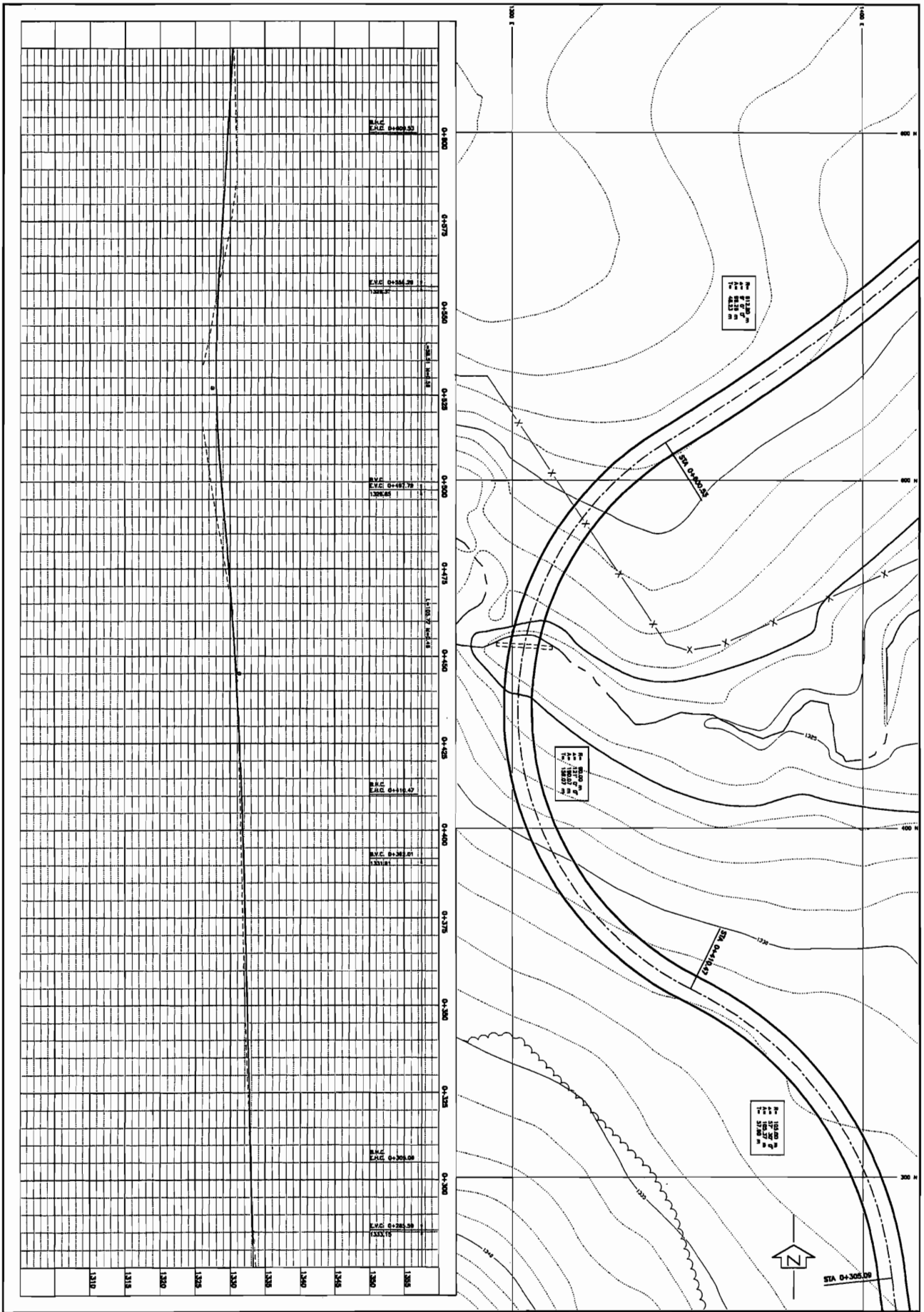

B.M. Potter Consultants Ltd.

DRAWN: C.S. BRIGGS | DATE: 12.03.92
APPROVED: B.M. POTTER | SCALE:
DESIGNED: L.J. COUGHLIN | JOB No.: 268-004

P-12

ACCESS ROAD
STA. 0+300.00 TO 0+600.00

DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

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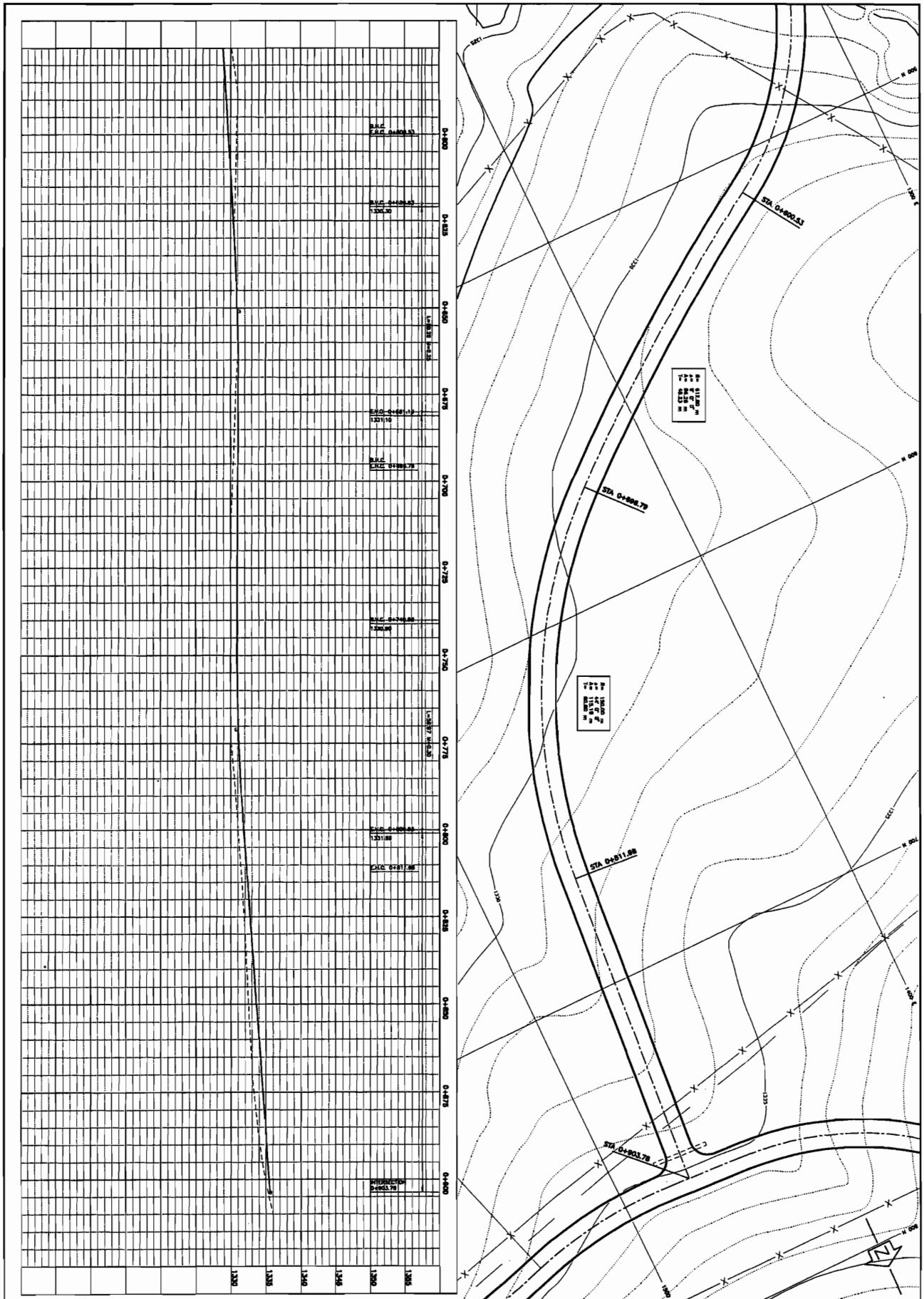

B.M. Potter Consultants Ltd.

DRAWN G.S. BRIGGS	DATE 12.03.92	
APPROVED B.M. POTTER	SCALE	
DESIGNED L.J. COUGHLIN	JOB No. 255-004	

SHEET 3 OF 3

ACCESS ROAD
STA. 0+600.00 TO 0+903.76

DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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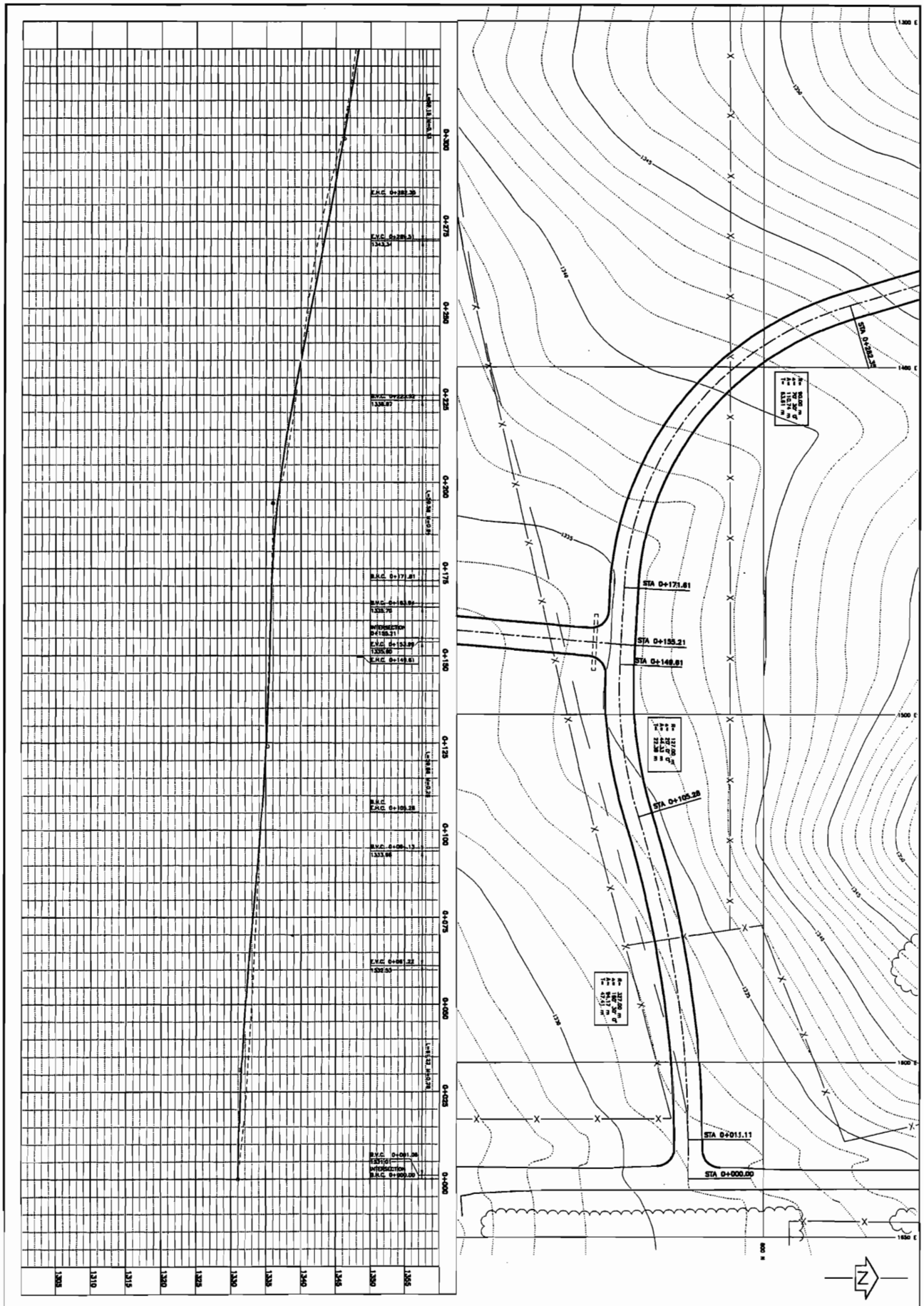

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DESIGNED: L.J. COUGHLIN	JOB No.: 286-004	

ACCESS ROAD
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DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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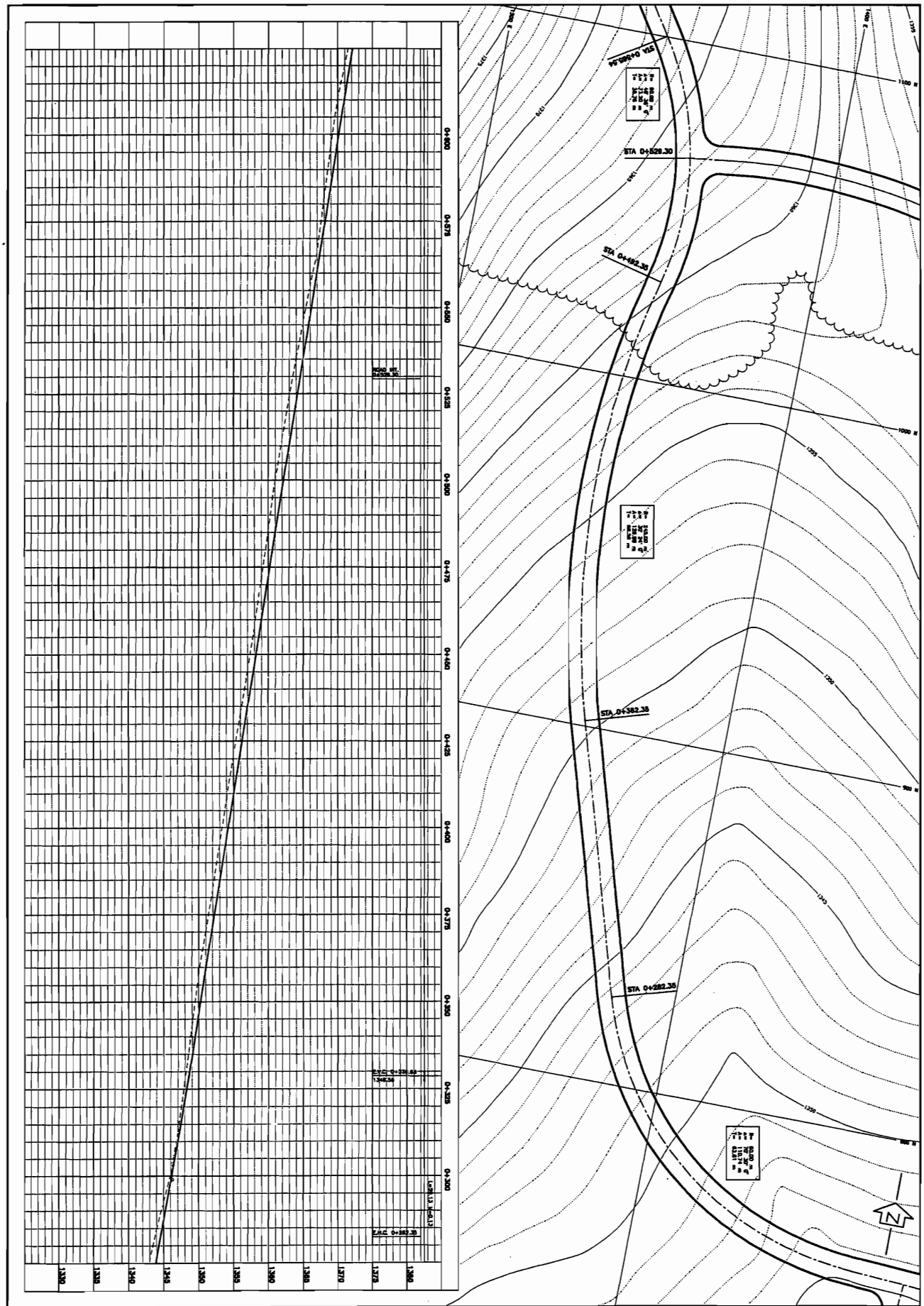

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DRAWN G.S. BRIDGES	DATE 12.03.92
APPROVED B.M. POTTER	SCALE
DESIGNED L.J. COUGHLIN	JOB No. 298-004

ACCESS ROAD
STA. 0+300.00 TO 0+600.00

DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

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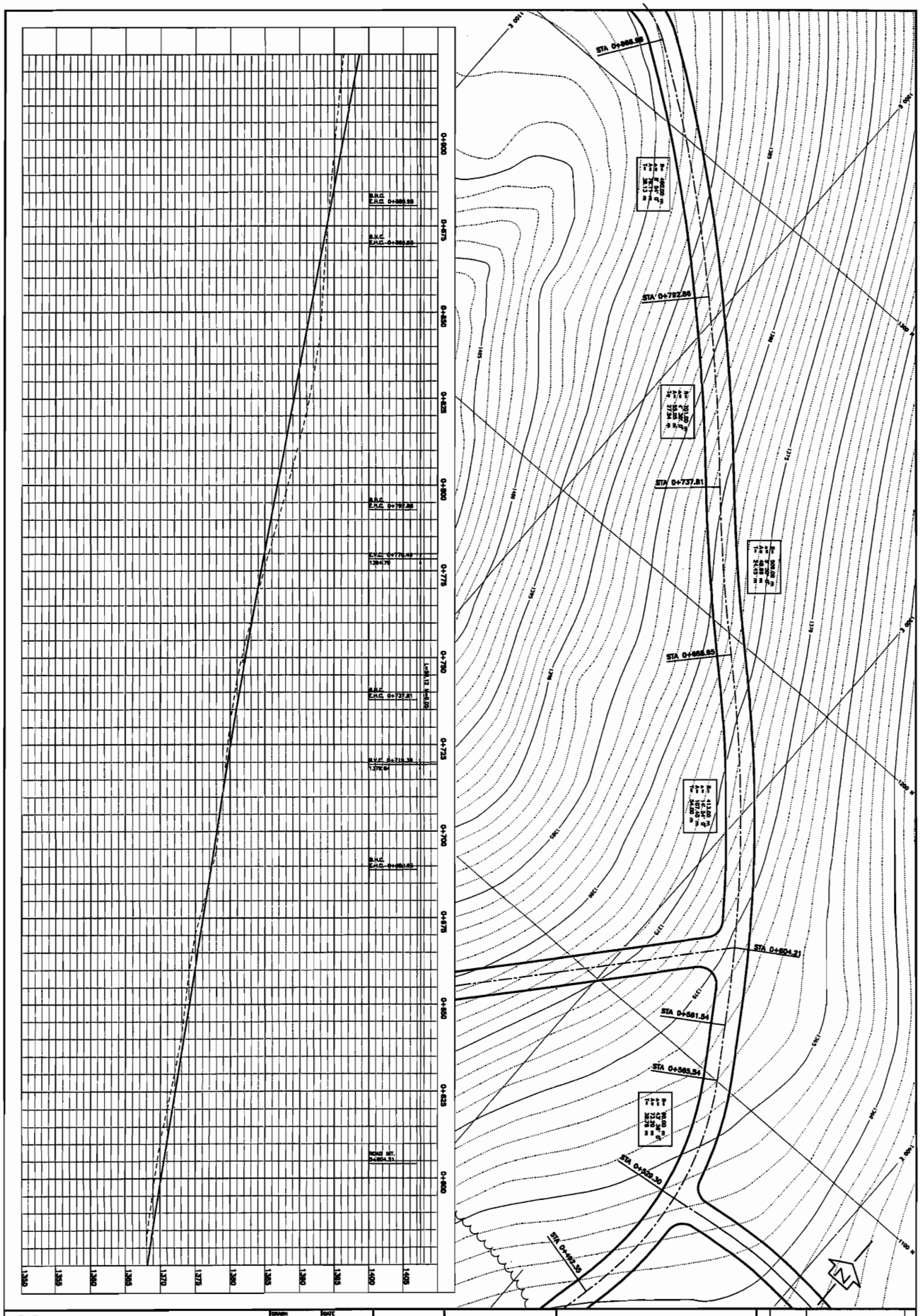

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	APPROVED: B.M. POTTER	SCALE:	
ACCESS ROAD STA. 0+600.00 TO 0+900.00	DESIGNED: L.J. COLEMAN	JOB No.: 288-004	

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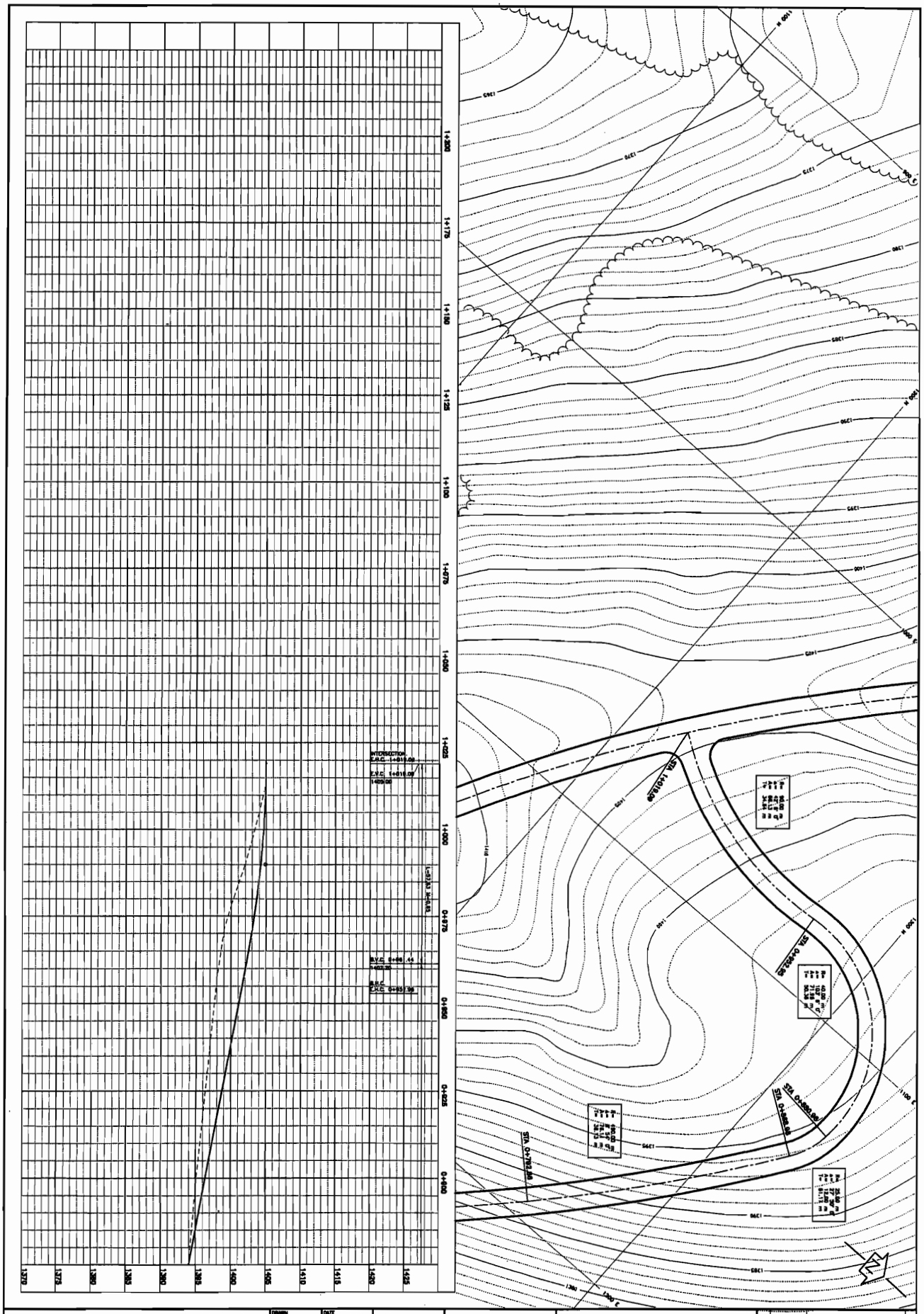

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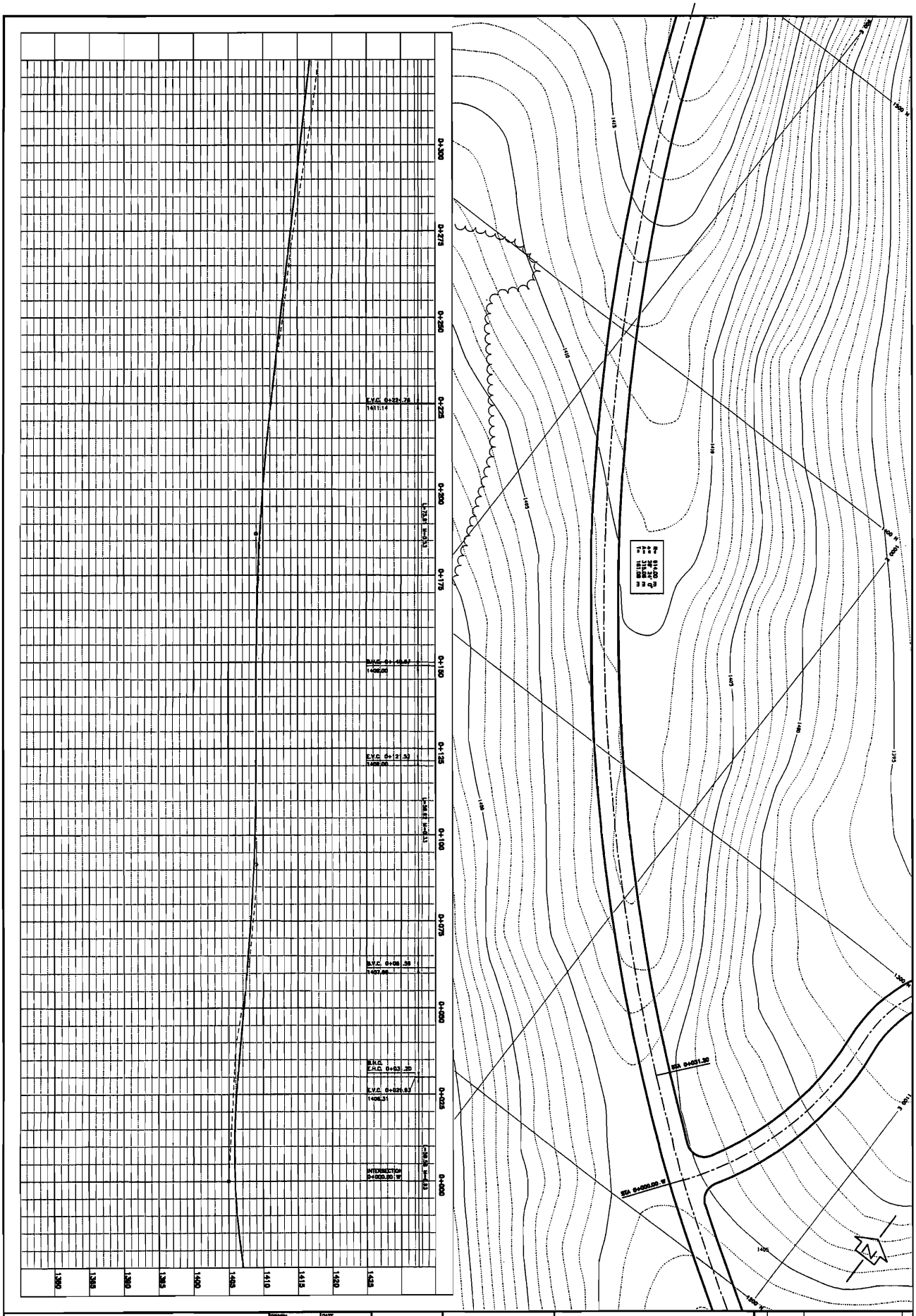

B.M. Potter Consultants Ltd.

PLAN

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DRAWN: C.S. BRIGGS	DATE: 12.03.92
APPROVED: B.M. POTTER	SCALE:
DESIGNED: L.J. COUGHLIN	JOB No.: 255-004

DEVELOPMENT ROAD NETWORK

for

SQUARE BUTTE RANCH

MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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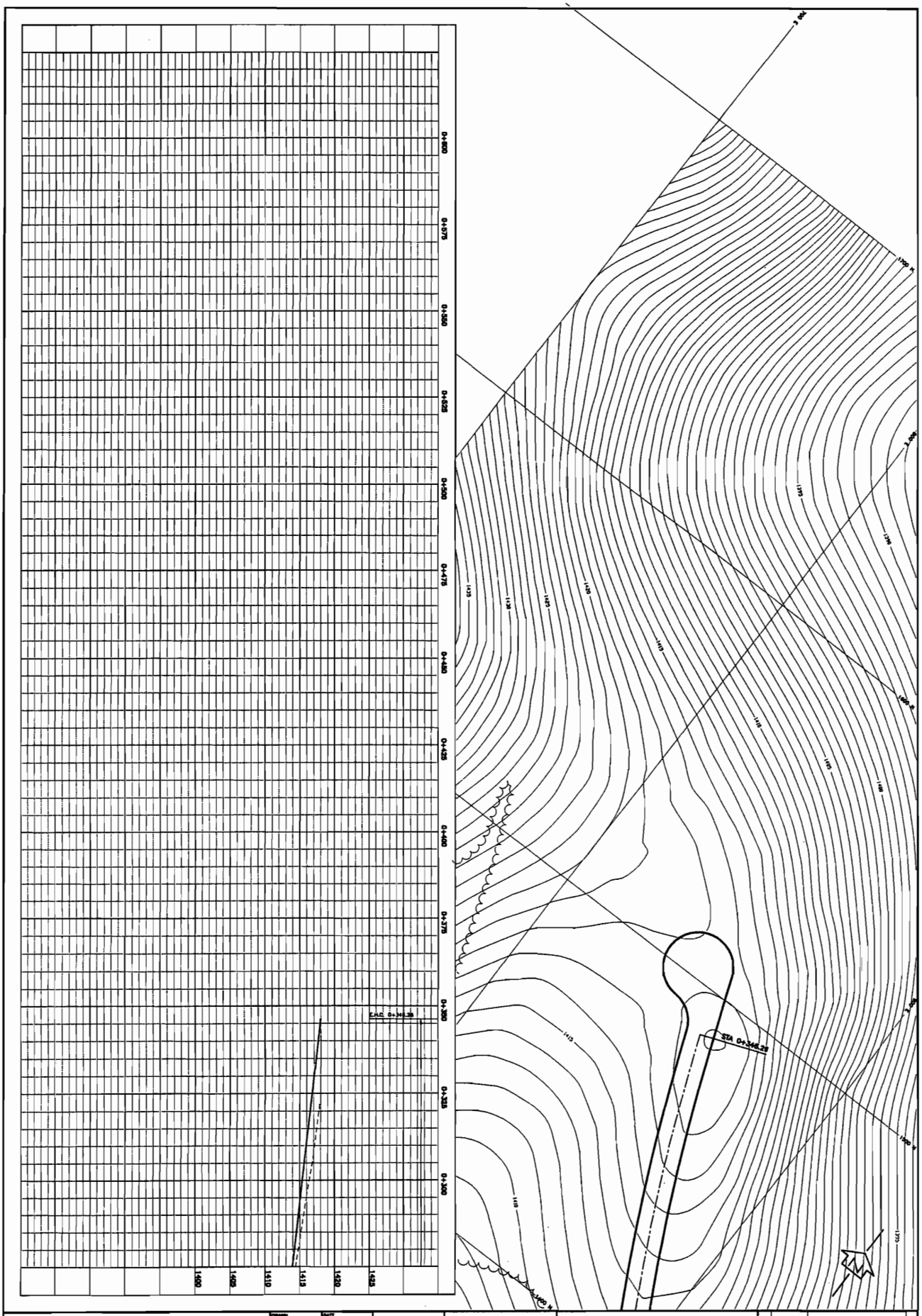

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APPROVED: B.M. POTTER | SCALE:
DESIGNED: L.J. COUGHLIN | JOB No. 266-004

DWG. No. P-6

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DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

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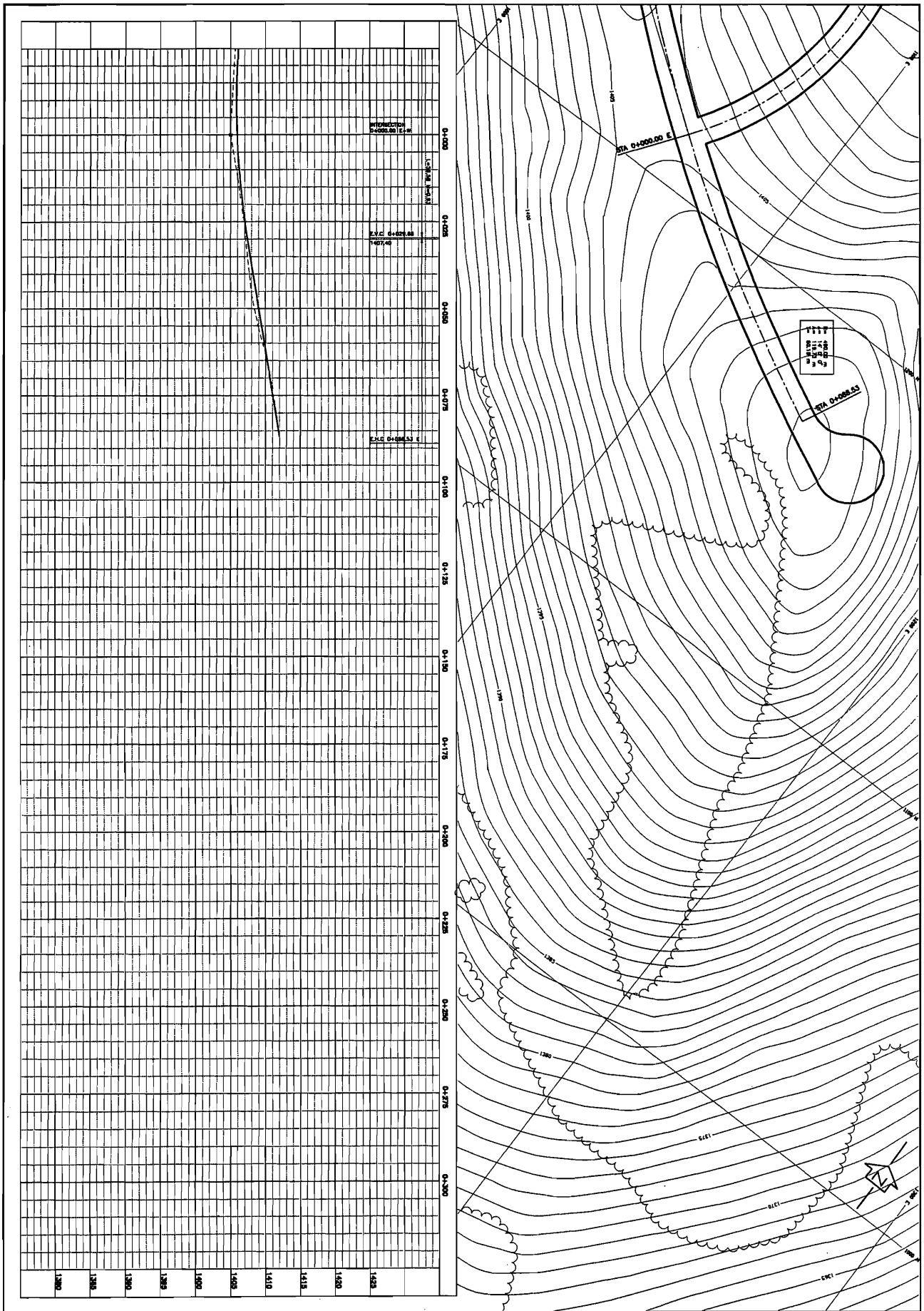

B.M. Potter Consultants Ltd.

DRAWN	G.S. BRIGGS	DATE	12.03.92
APPROVED	B.M. POTTER	SCALE	
DESIGNED	L.J. COUGHLIN	JOB No.	268-004

DWG. No. P-10

ACCESS ROAD
STA. 0+000.00 TO 0+088.53 E

DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
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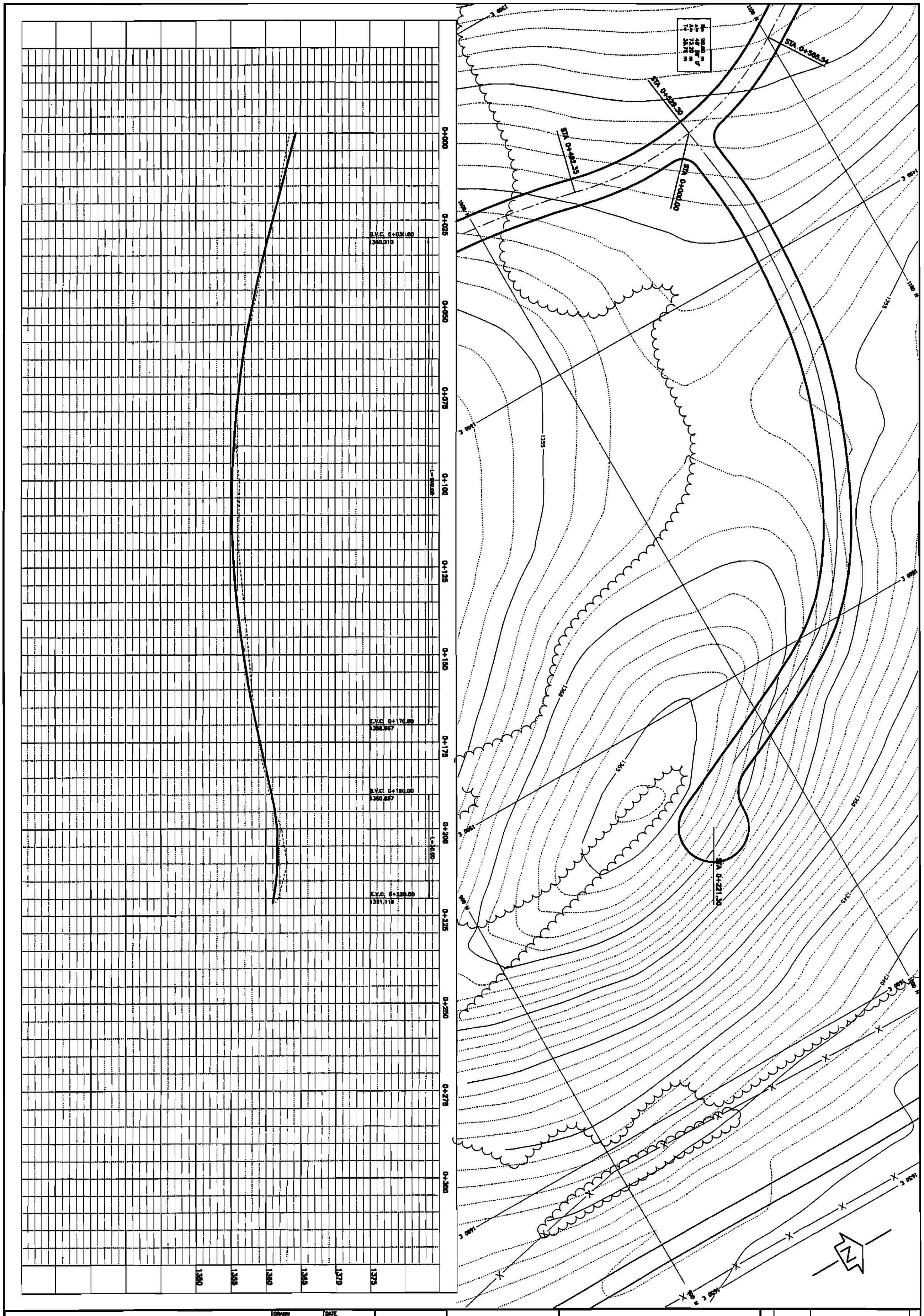

B.M. Potter Consultants Ltd.

DRAWN	DATE
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APPROVED	SCALE
B.M. POTTER	.
DESIGNED	JOB No.
L.J. COUGHLIN	268-004

DWG. No. P-11

ACCESS ROAD
STA. 0+000.00 TO 0+221.30

DEVELOPMENT ROAD NETWORK

for

SQUARE BUTTE RANCH

MILLARVILLE ALBERTA

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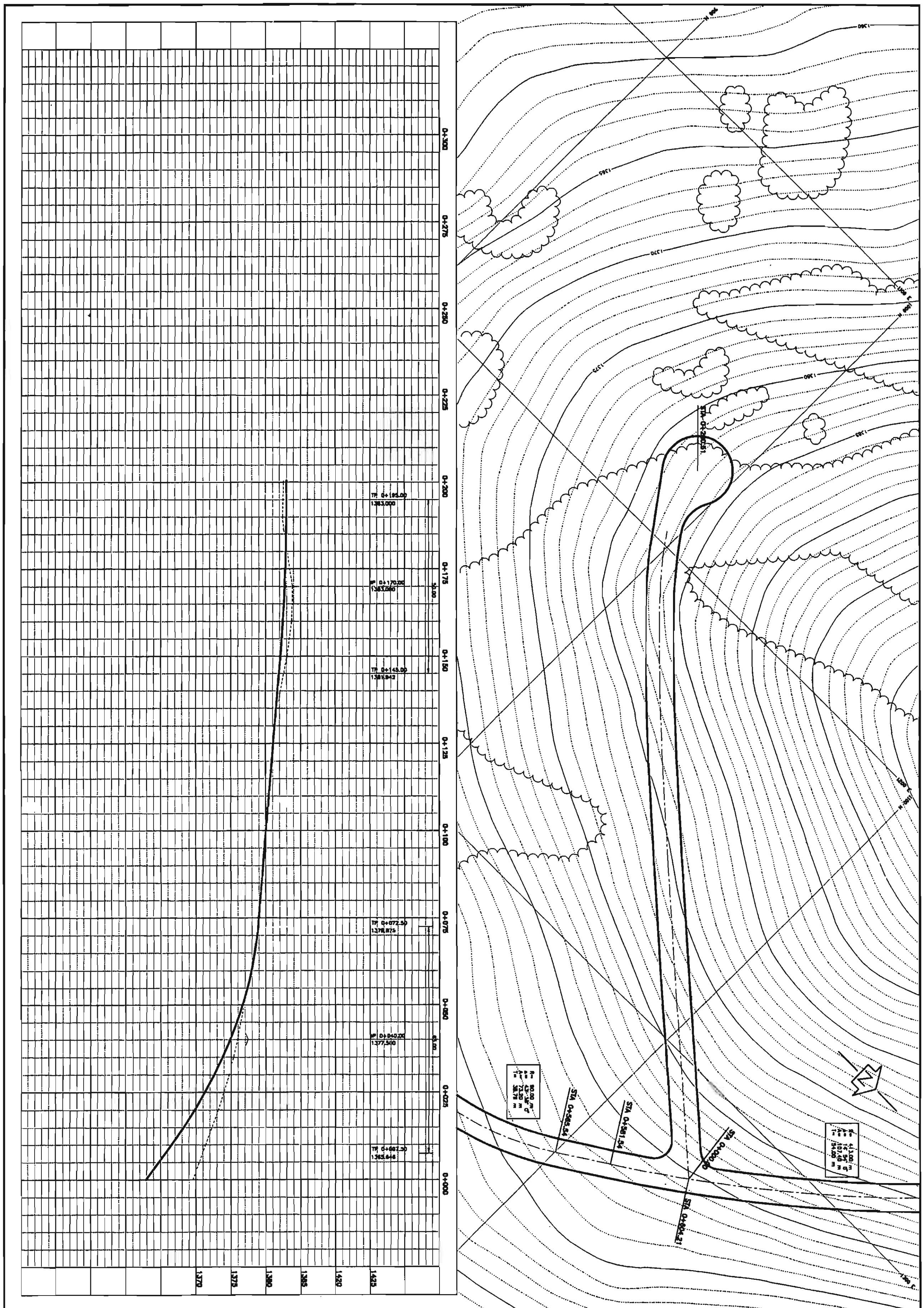

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L.J. COUGHLIN	256-004

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DEVELOPMENT ROAD NETWORK
for
SQUARE BUTTE RANCH
MILLARVILLE ALBERTA

No.	DATE	REVISIONS	BY
1	04.29.93	PRELIMINARY	GP

SQUARE BUTTE RANCHES

PHASE 2
CONCEPT PLAN

N½ SECTION 17- 20 - 21 - 4 W5M
SE¼ SECTION 20 - 21 - 4 W5M

SCALE 1:2500
JUNE 1998

LEGEND

LOTS PHASE ONE

PHASE TWO

KYLLO PLANNING & DEVELOPMENT LTD CALGARY, ALBERTA