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# AREA REDEVELOPMENT PLAN

RAILWAY RELOCATION LANDS  
AREA REDEVELOPMENT PLAN

PREPARED FOR:

The Lethbridge Railway Relocation  
Project Agency

PREPARED BY:

Damas & Smith  
Division of DSL Consultants Ltd.

January, 1983

*Bylaw 3899*

In October, 1980 the Lethbridge Railway Relocation Project Agency was established by agreement between the Province and the City of Lethbridge and represents this co-ownership of the subject lands.

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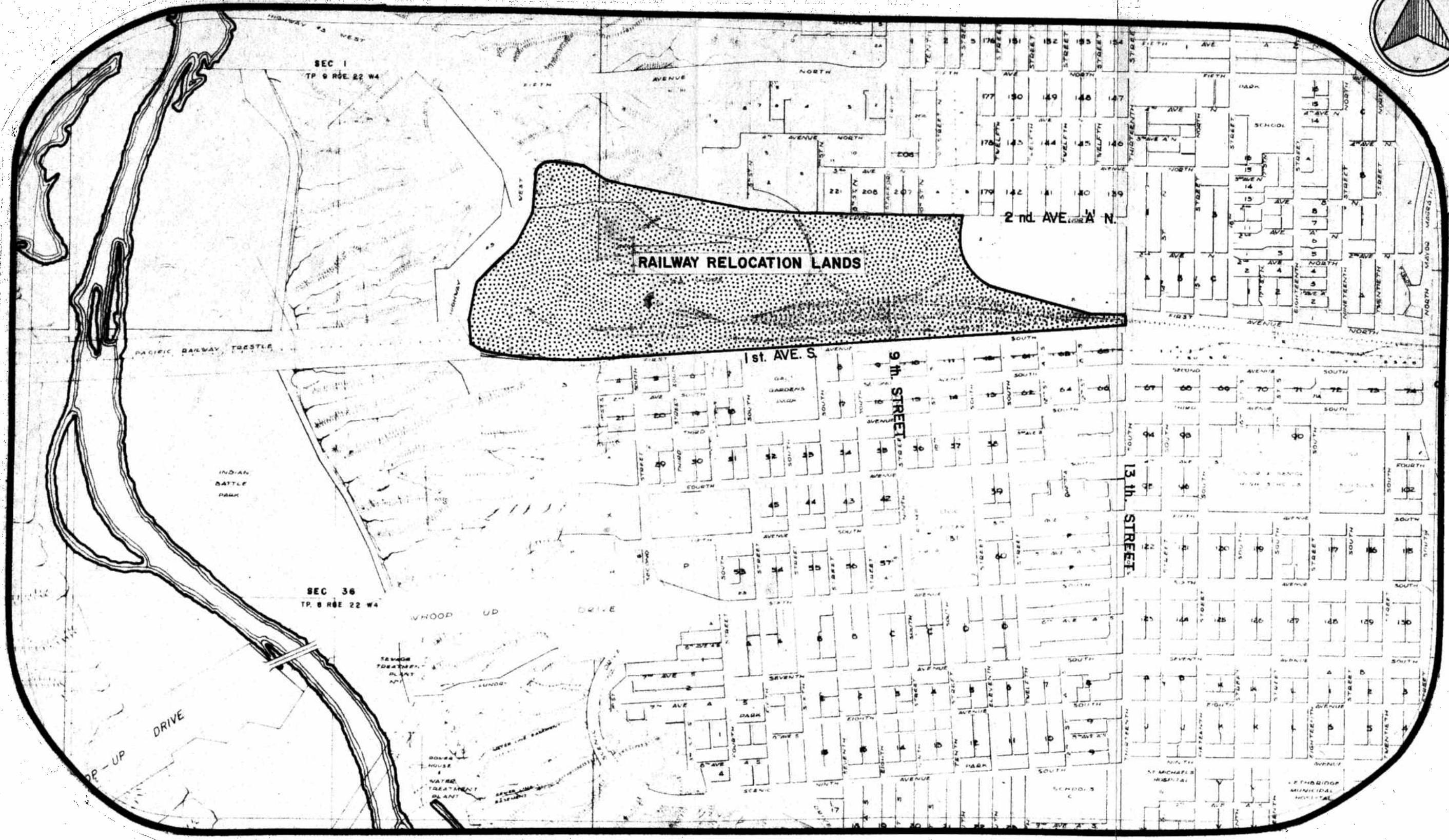
## 1.0 INTRODUCTION

### 1.1 BACKGROUND

The Railway Relocation Lands Area Redevelopment Plan has been prepared for an area, situated in the west central portion of Lethbridge, primarily made up of those lands to be vacated by the Canadian Pacific Railway (Map 1) during implementation of the City's Relocation Program.

A 1977 report, entitled "Lethbridge Railway Relocation Scheme: Application Documentation", summarized the results of a provincially funded study which examined the feasibility of relocating the Canadian Pacific Railway marshalling yards to Coalhurst. As part of the same study, several land use/transportation concept plans were formulated for the proposed subsequent redevelopment of the vacated railway lands. One of these alternative redevelopment plans, known as Option 6, was subsequently endorsed by Council as Railway Relocation Scheme Bylaw 3398 (adopted in 1977).

A 1980 report, entitled "Lethbridge Railway Relocation: Market Analysis and Development Concept Update", provided an overall review and update of the above noted Option 6 redevelopment concept and serves as the market support for this report. The general purpose of the review was to assess the current validity of Option 6 recommendations respecting the various land uses proposed in the 1977 study. This assessment was carried out in view of the present-day marketability of suggested land use concepts, and in light of the general economic climate and growth projections for Lethbridge and its surrounding trade area.



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**RAILWAY RELOCATION LANDS**  
**LOCATION**  
 The City of Lethbridge, Alberta.

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Many of the findings contained in this document have evolved from the research and analyses accomplished during these earlier studies.

In March 1980, Lethbridge City Council adopted the General Municipal Plan Bylaw No. 3573 which designated the area comprising the Railway Relocation Lands as requiring an Area Redevelopment Plan pursuant to Sections 65 through 67 of the Planning Act (1980). The undertaking of an Area Redevelopment Plan was deemed a prerequisite to any development occurring on said lands.

In October, 1980, the Lethbridge Railway Relocation Project Agency was established by agreement between the Province and the City of Lethbridge and represents this co-ownership of the subject lands. The Project Agency's primary function is to arrange for orderly relocation of the C.P.R. trackage to an area outside the City and to administer the redevelopment of the area to a more beneficial use to the City, once the former trackage area is freed up by the relocation. The actual relocation program commenced in 1981.

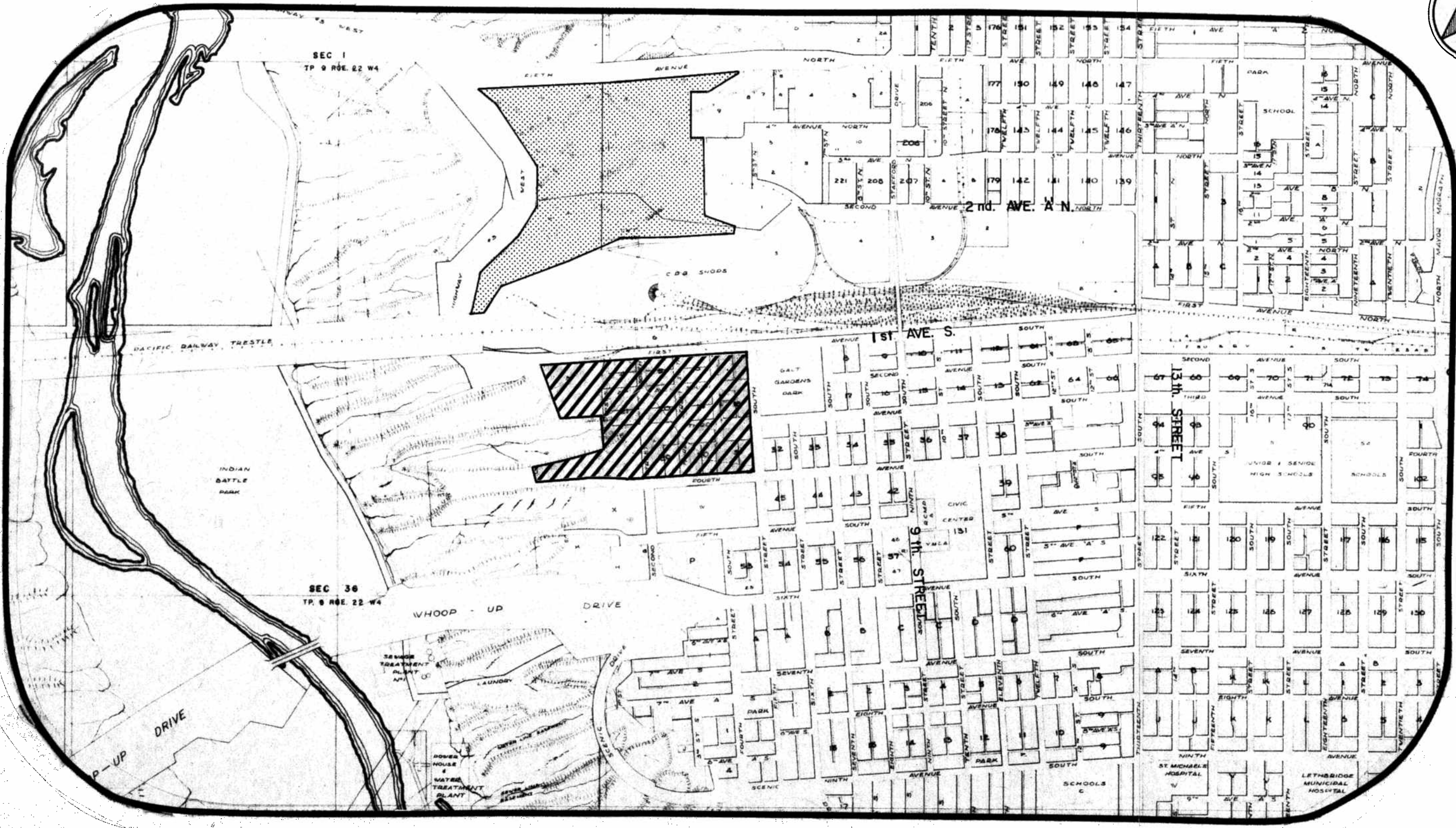
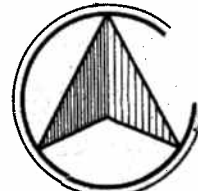
## 1.2 AREA REDEVELOPMENT PLAN

### 1.2.1 Area Redevelopment Plan



Section 65 of the Planning Act (1980) authorizes a Council to designate an area of a municipality as a redevelopment area for the purpose of preserving or improving land and buildings; rehabilitating buildings, removing buildings, constructing or replacing buildings, or establishing, improving or relocating public roadways, public utilities or other services.



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 STUDY LAND AFFECTED BY RESTRICTED DEVELOPMENT AREA DESIGNATION  
 DOWNTOWN PHASE II AREA REDEVELOPMENT PLAN


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**RAILWAY RELOCATION LANDS**  
**STUDY LANDS AFFECTED BY R.D.A. DESIGNATION**  
 The City of Lethbridge, Alberta.

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The present document is termed an Area Redevelopment Plan because lands initially developed exclusively for railroad purposes are currently awaiting redevelopment for urban purposes.

#### 1.2.2 Mandatory Requirements of an A.R.P.

According to the Planning Act, an Area Redevelopment Plan may involve the preservation, rehabilitation, removal or replacement of buildings, and the establishment, improvement or relocation of public roadways, utilities and other services in the redevelopment area.

Upon the establishment of a redevelopment area, the Planning Act further authorizes a Council to adopt an Area Redevelopment Plan which must describe:

- (i) the objectives of the plans and how they are proposed to be achieved,
- (ii) the proposed land uses for the redevelopment area,
- (iii) the proposed public roadways, public utilities and other services,
- (iv) the location of reserve land, and
- (v) the recreational and school facilities likely to be required.

The Planning Act also authorizes a Council to impose and collect an off site levy or a redevelopment levy to help defray the costs associated with improved municipal services, and for the acquisition of land for schools, parks, recreational facilities and such other municipal public uses as the Council sees fit. Specific proposals for the acquisition of land for public use must also be described by the Plan.



### 1.2.3 Discretionary Items In An A.R.P.

While the five items listed in section 1.2.2 are the mandatory requirements of an Area Redevelopment Plan, the Act also authorizes a Council to have an Area Redevelopment Plan address other issues which, at the discretion of Council, are deemed to be of importance. These have been identified as follows:

- (i) the sequence of development proposed for the area,
- (ii) the density of population proposed for the area, either generally or with respect to specific parts of the area.

### 1.2.4 Conformance With Other Statutory Policies

The Planning Act states that an Area Redevelopment Plan must conform with the Land Use By-law and any other statutory plan affecting the area that is the subject of the plan. In accordance with this requirement, it is intended that the existing City of Lethbridge General Municipal Plan and Land-Use By-Law will, where necessary, be amended with Council's passing of this Area Redevelopment Plan.

## 1.3 THE REGIONAL LEVEL

The City of Lethbridge assumed responsibility for its municipal planning during 1979. Prior to this, the City's planning agency was the Oldman River Regional Planning Commission. The power to grant subdivision approval was transferred to the City in April of 1980. Presently the City of Lethbridge enjoys complete authority over all municipal planning matters and development control procedures.

#### 1.4 THE GENERAL MUNICIPAL PLAN

Adopted by Council in March of 1980 by Bylaw No. 3573, the Lethbridge General Municipal Plan is largely a collation of background studies and proposals made by planning staff at both the local and regional levels.

In view of the fact that development of the railway lands received close municipal scrutiny as part of the 1977 railway relocation scheme, the Lethbridge General Municipal Plan purposely avoids a detailed analysis of the role these lands are seen to play in the future growth and development of the City. The position of the City is made clear by the following extract from Transportation Section 2.8.1, under the heading "Railway System":

"It is assumed that, in the long term, rail relocation will occur and that development of the yards will be more or less in accordance with the Scheme".

(General Municipal Plan, P. 56)

The term "scheme" refers to the aforementioned Option 6 redevelopment plan which was adopted by Council as Railway Relocation Scheme Bylaw 3398.

In addition, direct reference is made to the railway lands, comprising the primary study area of this document, by the following General Municipal Plan policy statements:

- ° Public Utilities Policy No. 82 states "that full consultation with A.G.T. occur as soon as details of the rail relocation project schedule are available, and that such consultation deal with co-ordination during the compensation for reconstruction of the main telephone lines which cross the rail yards";
- ° Transportation Policy No. 86 states "that efforts to determine the future of the rail relocation project continue to be of first priority for the City";
- ° Transportation Policy No. 87 states "that any development which affects land adjacent to the rail yards accommodate the possibility of relocation, and be complementary to land uses proposed under the Railway Relocation Scheme";
- ° The final, direct reference to the railway lands is found in the Plan Implementation part of the General Municipal Plan under section 3.2.2: "Land Suitable for Area Redevelopment Plans". Here, it is stated that: ".....the requirement for an A.R.P. in this area (i.e. the railway lands) will depend upon the decision concerning the timing of the rail relocation project". (General Municipal Plan, pg. 79).

In addition, certain other planning policies in the General Municipal Plan are seen as having implications for the ultimate disposition of the railway lands. Specifically:

- Commercial Policies 21, 22 and 23 support the maintenance of downtown Lethbridge as the commercial focus of the City's sub-region and call for the prevention of any regional or community shopping centres which would detract from this dominance;
- Commercial Policy 25 supports the development of a vibrant, multi-use downtown;
- Transportation Policy 89 supports the northerly extension of the Northwest Parkway across the subject area;
- Transportation Policy 91 supports the design of the proposed Highway 3 corridor as a community arterial; and,
- Special Consideration Policies 97 and 98 support tight restrictions on development within or adjacent to valley lands, and call for the possible requirement of impact statements assessing the effects of the development on both the natural environment and the surrounding community.

Overall, Section 67 (a) of The Planning Act, which requires that an A.R.P. conform to existing city planning policies as set down in the General Municipal Plan, is satisfied by the proposals contained in this document. Although the General Municipal Plan assumed that development of the railway lands would occur in accordance with the Option 6 redevelopment concept, it was understood at the outset that the Railway Relocation Scheme Bylaw No. 3398 would possibly require amending based upon an updated appraisal of the Option 6 land use proposals. This document assumes that By-law No. 3398 will be repealed and replaced by the adopted Area Redevelopment Plan.

### 1.5 LOCAL PLANS FOR ADJACENT AREAS

The Downtown Phase II Area Redevelopment Plan, approved by City Council in August, 1979, pertains to the portion of the downtown lying immediately south of 1st Avenue South, west of 5th Street South. A majority of the Phase II area is bounded by 1st Avenue South on the north, 4th Avenue South on the south, 5th Street South on the east, and the Oldman River Valley on the west. In addition, a separate block of land still further south, bounded by 5th and 6th Avenues and 4th and 5th Streets, is also subject to the Downtown Phase II Area Redevelopment Plan.

Because the Downtown Phase II Area Redevelopment Plan was formulated prior to the implementation of the then applicable Option 6 railway lands redevelopment concept, city planners proceeded on the basis that: "..... development plans for the Phase II area (would) be compatible with, but not reliant upon, the railway relocation concept". (Downtown Phase II Area Development Plan, pg. 11).

Subsequently, and pursuant to the Downtown Phase II Area Redevelopment Plan, the entire Phase II area was rezoned C3 Urban Renewal Area. The Plan itself calls for "incremental" revitalization of Downtown Phase II as a mixed-use area consisting of small-scale retail commercial, office and residential developments interspersed with restored buildings of architectural and/or historic significance.

To date, actual redevelopment of the Downtown Phase II Area Redevelopment Plan has been occurring e.g. the Court House, Chancery Court, Southland Terrace and restoration of the old firehall. Further redevelopment

of the area may however be delayed awaiting policy formulation for the Railway Relocation Lands and may come about as a direct spin-off from developments proposed to take place on the adjoining railway lands. On this basis, it should be appreciated that the Downtown Phase II Area Redevelopment Plan, and any proposed development for the Railway Lands must be complementary.

#### 1.6 RESTRICTED DEVELOPMENT AREA

The northwest portion of the Railway Relocation Lands, bordering the Oldman River Valley, falls within what is known as Restricted Development Area (R.D.A.). This zone is administered by the Provincial Department of the Environment, in consultation with the City. Development within the R.D.A., if allowed, is subject to restrictions in view of its proximity to the Oldman River Valley (see map 2).

It is anticipated, however, that certain types of recreational and related land uses, involving little in the way of physical structures, may be permitted within that portion of the Railway Relocation Lands primary study area subject to the R.D.A. zoning designation. Should the City receive proposals which incorporate background data supporting the suitability of the area for more intensive types of land use, the allowance of such would involve negotiations with provincial environmental authorities, and their subsequent approval.

#### 1.7 ENVIRONMENTAL RESERVE

Section 98 of The Planning act authorizes a subdivision approval authority, such as the Lethbridge Planning Commission, to designate certain categories of land as environmental reserve. These categories of land

normally include ravines, coulees, valley lands, flood plains, lands abutting bodies of water, unstable lands and, in general, lands which are considered to be physically unsuitable for development.

That portion of the subject lands lying in the northwest corner of the primary study area borders the Oldman River Valley and is dissected by coulees emanating from this valley. Consequently the environmental reserve provisions of The Planning Act may apply in this area.

In addition, Section 4 of the Provincial "Land Conservation Guidelines" states, in general terms, that development lands which border on or contain a coulee, ravine or valley may be subject to the determination of top-of-bank and the establishment of a building set-back from top-of-bank, the width of which will vary according to the average depth of the coulee, ravine or valley and the direction and severity of associated slopes.

Accordingly, the aforementioned portion of the study area may also be subject to a development setback pursuant to Section 4 of the "Land Conservation Guidelines".

## 2.0 SITE DESCRIPTION

### 2.1 PRIMARY STUDY AREA

For planning purposes, the physical boundaries of the Railway Relocation Lands have been identified as the proposed Highway 3 - Canadian Pacific Railway transportation corridor and a portion of 2nd Avenue A North either side of 9th Street in the north; 1st Avenue South in the south; 13th Street in the east; and the existing Highway 3 in the west. Henceforth, the aforementioned area will be referred to as the Primary Study Area. The physical boundaries of the primary study area are illustrated on Map 3.

### 2.2 IMPACT AREA

Although redevelopment of the Railway Lands will have an impact in one form or another upon the entire City of Lethbridge, a more immediate impact area has been identified on Map 3. This consists of those lands, in close proximity to the Primary Study Area, which will be influenced by any development proposed to take place on the railway lands. Accordingly, the existing downtown as far south as 6th Avenue South has been termed an Impact Area, as has the mixed-use, light industrial-commercial area to the north as far as 3rd Avenue North.

The intent of identifying an Impact Area within the framework of this Area Redevelopment Plan, is to acknowledge the inter-relationship of the Railway Relocation Lands with the existing form, function and fabric of the City's downtown urban environment.





### 2.3 EXISTING ZONING AND LAND USES WITHIN PRIMARY STUDY AREA

The existing zoning of lands comprising the Railway Relocation Lands Primary Study Area is shown on Map 4. Reflecting the historic use of these lands, much of the Railway Relocation Lands is presently zoned M1: Railway Operations District. As of the writing of this report, the lands zoned M-1 remain primarily in railway use and are covered by marshalling yard trackage, maintenance, utility and storage sheds, and the administrative buildings. The only exception to these uses occurs on lands bordering 9th Street North immediately south of 2nd Avenue A North. Here, the lands to the west of 9th Street are in light-industrial use, while the lands to the east of 9th Street are used for the storage and display of automobiles, farm implements and mobile homes.

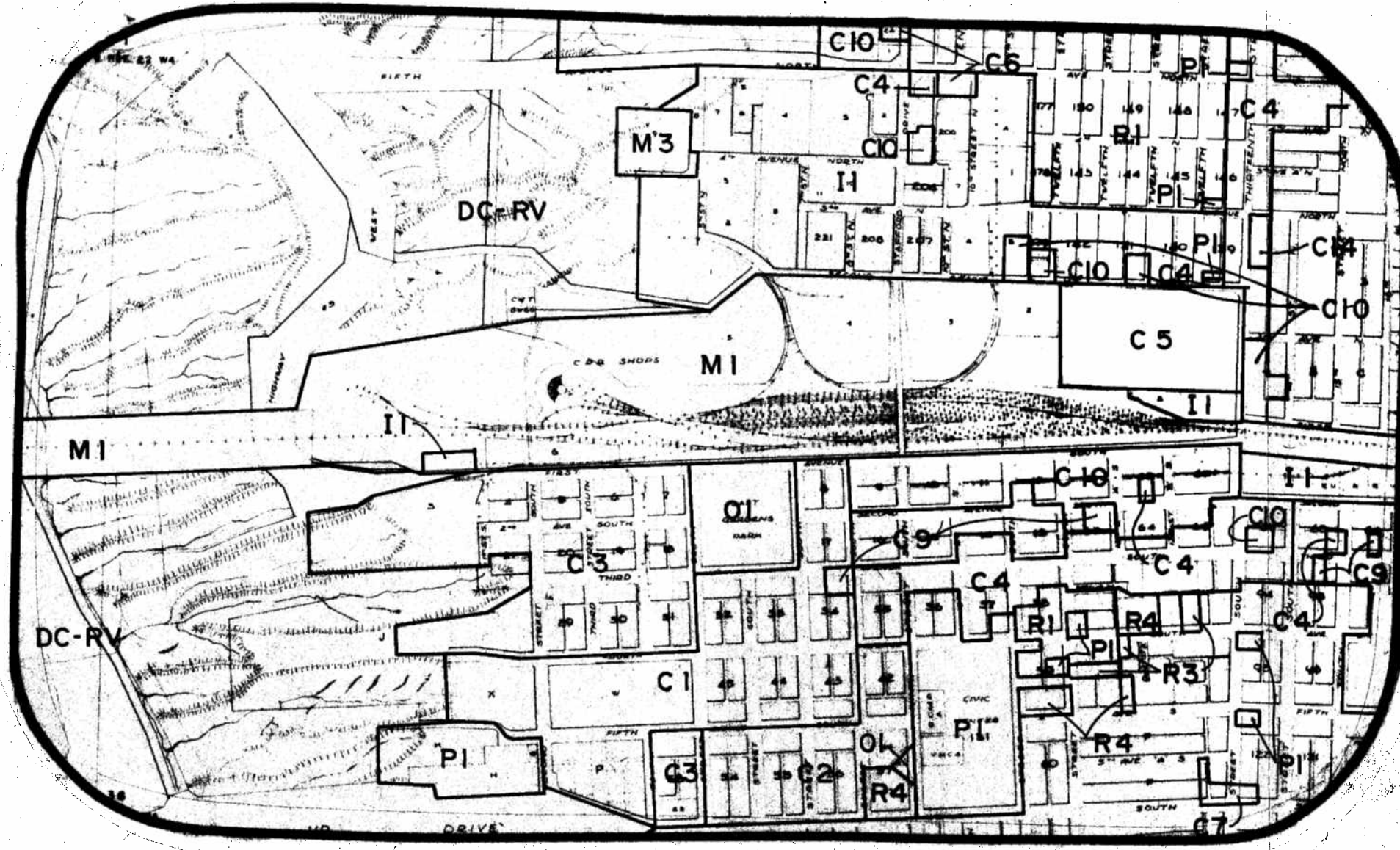
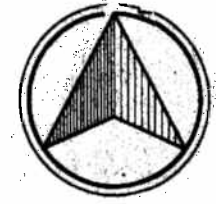
The small parcel of land fronting 1st Avenue South in the southwest corner of the Primary Study Area is presently zoned I-1 light industrial. This parcel is comprised of a vacant lot and a commercial lot used for the display and sale of house trailers.

The lands in the northwest portion of the Primary Study Area, presently zoned Direct Control-River Valley District (DC-RV), have been previously dealt with in this report under section 1.6: Restricted Development Area (R.D.A.). The said lands are vacant at the present time due to the restrictive zoning and the severity of slopes in this area.

Upon adoption of this Area Redevelopment Plan and processing of actual development applications, the zoning of the lands comprising the Railway Relocation Lands will be changed to reflect the land use concepts contained herein, and the City of Lethbridge Land Use By-Law No. 3574 will be amended accordingly.



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**RAILWAY RELOCATION LANDS**

**EXISTING ZONING (FEB. 82)**

The City of Lethbridge, Alberta.

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## 2.4 EXISTING ZONING AND LAND USE IN ADJACENT AREAS

The existing zoning and land use, in adjacent areas, is also indicated on Map 4. To the north, lands bordering the Railway Relocation Lands are zoned, from west to east, Direct Control-River Valley (DC-RV), Light Industrial (I-1), Commercial Warehousing (C-10), Regional Commercial (C-5) and, Light Industrial (I-1).

The actual land use in the Light Industrial area is dominated by businesses selling and servicing cars, trucks, house trailers, mobile homes, farm equipment, construction equipment and recreational vehicles and accessories. The City's public works depot and storage compound is a major land use activity in this area.

Abutting the northeast corner of the Railway Relocation Lands, the area of land zoned Regional Commercial (C-5) contains a department store-anchored shopping centre, while the parcel zoned Light Industrial (I-1) contains a pasta production and packaging plant.

To the south, lands bordering the Railway Relocation Lands are zoned, from west to east, Urban Renewal (C-3), Public Park and Recreation (O-1), Central Business District (C-1) and Commercial Warehousing (C-10).

The wide range of land uses in this "belt" area is indicative of its transition between the rail yards to the north and the central business district to the south. In many respects, the presence of the rail yards has had a negative aesthetic impact, along the entire south side of 1st Avenue South, by encouraging the influx of a number of land use activities which would be more appropriate in a light industrial area. Consequently, grain elevators,

warehouses, storage compounds, wholesale outlets, repair shops and automotive sales agencies, service and accessories outlets are interspersed with houses, apartments, hotels, restaurants, offices and a wide range of retail shops and stores. A large number of buildings in this area are in need of repair or replacement, while the presence of abandoned buildings and vacant lots points to the need for a program of upgrading and redevelopment.

## 2.5 TOPOGRAPHY

Following from the physical layout of the marshalling yards, the area comprising the Railway Relocation Lands is a long, narrow belt running in an east-west direction. The lands are quite flat throughout the eastern portion of the site. Elevations remain fairly constant at or about 910 metres A.S.L.\*

Moving westward through the central portion of the site, in the vicinity of the roundhouse, the lands dip slightly to elevations of approximately 908 metres A.S.L., but continue to remain fairly even.

Moving into the undeveloped western portion of the site, the lands again dip slightly and begin to undulate slightly. Elevations vary from 904 metres A.S.L. to 907 metres A.S.L.

At the extreme western edge of the site, a fairly level nature of the table lands gives way to the steep slopes of coulees associated with the Oldman River Valley

\* A.S.L. - Above Sea Level

formation. Here, the eventual drop from the table lands down to the valley floor is broken by the existing Highway No. 3 as it curves its way upwards, forming the western boundary of the site, to link with 1st Avenue South.

A significant coulee forms the northwestern boundary of the site. The vertical drop from the table lands at the coulee's tip to the highway at its base is approximately 33 metres.

Only in the far western portion of the Railway Relocation Lands does topography become a constraint to physical development. As indicated on Map 5, certain of the coulee slopes exceed 30 percent and, as mentioned in Section 1.7, may be subject to varying setback requirements or to special design treatment.

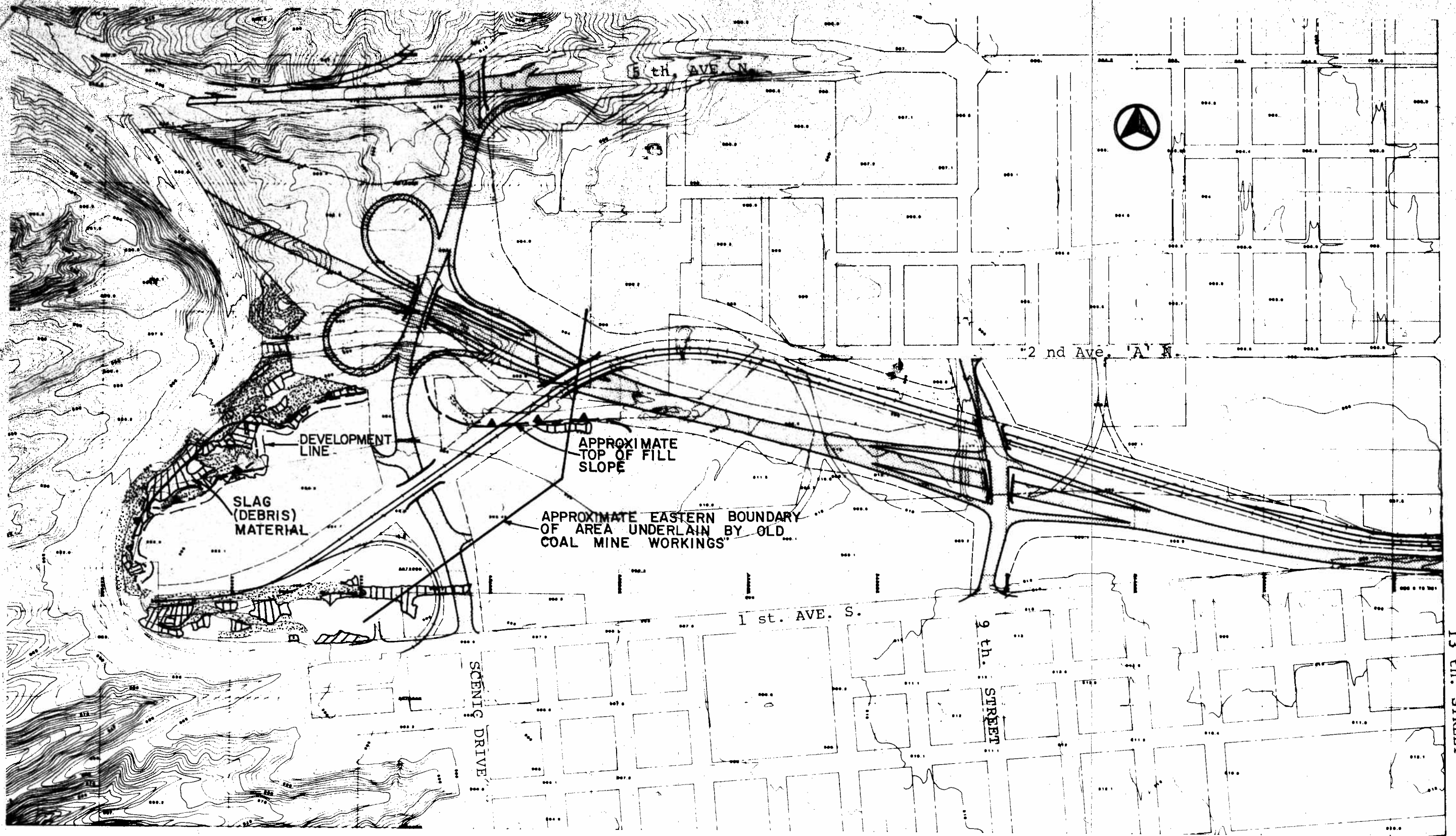
## 2.6 SOIL CONDITIONS, GEOLOGY AND ABANDONED COAL MINES

A preliminary geotechnical investigation was carried out for the Railway Relocation Lands as part of the initial research for this document. The investigation consisted of a literature review, air photo examination and a ground reconnaissance. The objective of the program was to identify geotechnically related factors that may affect site development and to provide guidelines for planning and conceptual development designs. The technical report is contained within Appendix A. A brief summary is provided in the following sections.

### 2.6.1 Soil Conditions; Geology

Subsurface soil conditions on the site consist of clay (till) with interbedded sand units. The material is overlaid by an undetermined thickness of debris (slag) material. This layer consists primarily of slag material from





- 
- 0% - 15% SLOPE
15% - 30% SLOPE
> 30% SLOPE
TOP OF SLOPE
DEVELOPMENT LINE

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**RAILWAY RELOCATION LANDS**

**SLOPE ANALYSIS**

The City of Lethbridge, Alberta.

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steam locomotive days and dumped waste debris. Some round to oval depressions found on the west side of the site are possibly due to coal mine subsidence while others are thought to be related to former foundations of old buildings on the site, including an abandoned roundhouse.

The vegetation on the site consists of natural grasses and some shrubs. Along the north slope adjacent to the coulee, the vegetation pattern indicates that some seepage has occurred along the slope. West of Highway 3, the slope drops off approximately 70 metres to the flood plain of the Oldman River. This slope is markedly incised by a series of coulees.

The Lethbridge area is underlaid by a system of buried valleys. These valleys are infilled with material deposited by successive glaciers, lakes, aggrading rivers and wind. The various deposits are exposed on numerous bluffs along the modern day Oldman River. The carbonaceous siltstone of the Oldman Formation contains several coal bearing seams as well as one or more bentonite beds. Above the Oldman Formation, separated by a buried gravel channel, are various till layers composed of clay, silt and sand with occasional gravel lenses.

Based on preliminary geotechnical investigations (see Drawing B-1, Appendix A), a "safe development" line has been established. For preliminary planning purposes the recommended setback line has been established, by the geotechnical consultants, 10 metres back from the "top of slope" line indicated on Map 5. Further investigations, including test hole drilling and laboratory testing will allow the refinement of this "safe development" limit, especially in areas of slag dumping and fill areas north of the existing roundhouse building.



The approximate top of fill slope and some of "slag" (debris) material is also shown on Map 5. The fill slope represents the approximate limits of a former sanitary land fill site. Certain types of development beyond the top of slope line may also prove feasible following more detailed geotechnical studies.

#### 2.6.2 Abandoned Coal Mines

The extent of abandoned mine workings within the vicinity of the study area, as obtained from the Energy Resources Conservation Board (ERCB), is outlined on Map 5. A more detailed location plan is contained in Appendix A. These plans, although dated during the 1940's, are used by the ERCB Coal Department and are considered to be sufficiently accurate for purposes of preliminary development planning. A more accurate delineation of abandoned mine locations will be required prior to final development of the site.

From Map 5, it is evident that the abandoned coal mine workings are located directly under Sites 2 and 3 and under a small portion of Site 4. The prospect of subsidence occurring within the affected zones will have to be established or an appropriate structure design formulated prior to final development approval.

#### 2.6.3 Summary of Geotechnical Considerations

As a result of the preliminary investigation three potential problem areas were identified. These are as follows:

- ° The site is located adjacent to the Oldman River Valley. The results of a stability analysis, carried out using assumed soil stratigraphy, strength parameters and piezometric surface, indicated that the safety against failure is generally less than 1.5

and less than unity for a water table located within 4.0 m of the ground surface. While no old failure scars were observed on the slope adjacent to the site, old and recent slope failures were noted along other sections of the river valley.

- The western portion of the site is underlaid by old coal workings. Abandoned adits and shafts are known to exist but their exact locations require further testing. Shallow depressions observed on the site are suspected to be the result of ground subsidence arising from these old mine openings. Consideration must be given to these openings in site redevelopment.
- Areas within the site have been used as railway waste and fill dumps. The nature and extent of these dumps will have to be determined and appropriate design and construction measures implemented to accommodate these materials.

In light of this, the following geotechnical studies should be conducted in conjunction with specific development applications and prior to development approval.

- Detailed investigation and analysis of long-term valley slope stability adjacent to the proposed redevelopment area.
- Detailed analysis of local slope stability for any development beyond the recommended setback distance and for any development other than light (low-load) commercial and residential structures.
- Detailed mine workings should be accurately located and any development supported by geotechnical tests for the western portion of the site should be designed to accommodate potential effects of these old workings.

- ° The exact extent and composition of fill areas identified on the site would be determined and appropriate design or remedial measures implemented to mitigate potential adverse effects on structure foundations.

The Project Agency has since proceeded with the necessary detailed geotechnical investigation. The results and recommendations of this report will be available to developers and City Administration, in order that due consideration may be given the issue at the outset. However development proposals and applications will require site specific supporting documentation.

## 2.7 VIEWS

Although the Primary Study Area is relatively flat, the far western portion, approaching the escarpment and coulees of the Oldman River, affords a pleasant view overlooking the Oldman River Valley.

## 2.8 DRAINAGE

Apart from marshalling yard trackage and a few associated buildings, much of the area comprising the Railway Relocation Lands is vacant. There is very little in the way of existing physical development on the subject lands, besides trackage, to impede their natural drainage via surface run-off and subsurface seepage.

Seepage occurs primarily in the eastern portion of the site, where the land is fairly level. In the western portion of the site, ponding occurs prior to seepage, during spring run-off and periods of intense rainfall, due to slight undulations. The extreme western portion of the site is drained by the coulees of the Oldman River Valley. Here, surface water follows the coulees downward to existing Highway 3, where it is picked up by the

storm sewer outfall which follows the highway to eventually discharge into the Oldman River. Slope erosion in this area is minimal due to the generous covering of prairie grasses. Overall, surface drainage presently occurs in an east to west direction following the general inclination of the lands.

## 2.9 LAND OWNERSHIP

The land ownership in the primary study area is outlined on Map 6. The majority of land is currently owned by the Canadian Pacific Railway. The remainder, with the exception of two small parcels owned by Marathon Realty, is owned by the Crown and the City of Lethbridge.

As a result of an agreement between the Province, the City of Lethbridge and the Canadian Pacific Railway, the Crown on behalf of the Project Agency will assume title to the C.P.R. and lands released by the railway relocation, excepting those required for the mainline corridor, by late 1983. The Project Agency will in turn, negotiate with the Road Authority the transfer of lands necessary for the Highway Corridor, including the portions of 9th Street and North Scenic Drive situated in the study area. The Project Agency is also responsible for the disposition of lands which will be used for urban development.

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- C.P.R.
  MARATHON
  CITY
- CROWN
  PRIVATE

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**RAILWAY RELOCATION LANDS**

**PROPERTY OWNERSHIP**

The City of Lethbridge, Alberta.

REV. BY	DATE	DESCRIPTION

DRAWN	DATE	SCALE	DRAWING No.
		1:6000	81005-6

### 3.0 TRANSPORTATION

#### 3.1 EXTERNAL NETWORK

One of the several important benefits of the railway relocation program has been the improved opportunity for development of the City's transportation network. Removal of rail yard trackage and relocation of the railway mainline facilitates redevelopment of the existing Highway 3 link through Central Lethbridge and development of north-south arterial connections. Planning, design, and development of these major transportation improvements falls within established programs for joint provincial and municipal funding. Planning and design has been the responsibility of a Road Authority, comprising city and provincial representation.

The proposed transportation corridor network provided by the Lethbridge Road Authority and approved by City Council is contained on Map 7\*. The land requirements shown for the various road facilities are approximations only, as the respective rights of way have not been surveyed or established in final form. The estimated rights of way, indicated on Map 7, were derived from the Road Authority or by taking a parallel line 5 metres from the cut and fill line established during the functional design of the network.

The proposed transportation network divides the Railway Relocation Lands into several parcels, each of which is assigned a site number in Map 7.

\* The transportation network has been revised since the writing of this report as shown in Appendix C. The revision changes the interchange at Crowsnest Trail and North Scenic Drive from a Parclo A-B to a half diamond.

### 3.1.1 The C.P.R. Mainline

The proposed realignment of the C.P.R. mainline between 13th Street and the high level trestle bridge is outlined on Map 7. Dual trackage is proposed through all of the primary study area. Three spur lines are provided; one situated at the eastern extreme of Site 5A one near 13th Street and another at the eastern extreme of Site 2. This latter spur will serve the brewery situated south of 1st Avenue South. All existing trackage within the Railway Relocation Lands will otherwise be removed.

The portion of the mainline situated between the Crowsnest Trail and the high level trestle bridge is proposed to be at approximately existing ground level whereas the portion east of Crowsnest Trail will be below existing ground level to a maximum of approximately 5 metres.

### 3.1.2 Crowsnest Trail (Highway 3)

The proposed Crowsnest Trail (Highway 3), instead of looping under the high level bridge, is diverted easterly through one of the coulees, and underpasses the relocated C.P.R. mainline just east of 2nd Street (North Scenic Drive). It then continues eastward parallel and south of the railway tracks. The entire portion of the Crowsnest Trail situated within the Primary Study Area will be depressed below existing ground level and, with the exception of proposed interchanges at the intersections with North Scenic Drive and 9th Street, direct access will not be permitted.

The proposed interchange at Crowsnest Trail and North Scenic Drive is a Parclo A B configuration\* and can accommodate the following turning movements:

\* The transportation network has been revised since the writing of this report as shown in Appendix C. The revision changes the interchange at Crowsnest Trail and North Scenic Drive from a Parclo A-B to a half diamond. This change does not alter the turning movements allowed.



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NOTE: APPENDIX 'C' REVISED INTERCHANGE CONFIGURATION AT NORTH SCENIC DRIVE AND CROWSNEST TRAIL

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**RAILWAY RELOCATION LANDS**

**TRANSPORTATION NETWORK**

The City of Lethbridge, Alberta

REV. BY	DATE	DESCRIPTION

DATE	ACTIVITY	SCALE	PROJECT NO.
		1:6000	81005-7



- \* Northbound right turn
- \* Southbound left turn
- \* Westbound right turn
- \* Westbound left turn

The other turning movements not accommodated by this interchange are provided in the following manner:

- \* Northbound left turn traffic must proceed to 5th Avenue North;
- \* Eastbound right turn traffic must follow the existing Highway 3 facility which will be retained as a one way in-bound, to a point just north of the high level bridge. Beyond this point the existing road will be retained as a two way facility, affording an access to Site 3;
- \* Eastbound left turn traffic must commit at the 5th Avenue North turnoff and follow this route;
- \* Southbound right turn traffic must do so on 5th Avenue North.

The relationship between this interchange and the proposed C.P.R. mainline results in a residual triangular parcel that, given no feasible access, is effectively sterilized for urban development.

The proposed interchange configuration at Crowsnest Trail and 9th Street is commonly referred to as a diamond. This facility can accommodate all turning movements.

### 3.1.3 North Scenic Drive

The proposed North Scenic Drive is a northward extension of 2nd Street or Scenic Drive as it is commonly known. The facility will be depressed north of 1st Avenue South, underpassing the C.P.R. mainline and overpassing the depressed Crowsnest Trail.

A right in/right out access/egress to Site 4 is indicated. This access-egress is located  $\pm$  5 metres below existing ground level on a 4 percent grade. An all turns access/egress is also provided to Site 3 north of the C.P.R. mainline underpass.

#### 3.1.4 9th Street

9th Street is proposed as a major north-south link through the Primary Study Area. This facility is intended to overpass both the Crowsnest Trail and the C.P.R. mainline. Direct access/egress to any of the subject sites is not provided. However, an all-turns intersection with 1st Avenue South and a T-intersection with 2nd Avenue A North are provided and will afford access to portions of the subject area. Access/egress to 2nd Avenue A North west of 9th Street will likely be eliminated.

#### 3.1.5 13th Street

13th Street, situated at the eastern limit of the Primary Study Area, is proposed to underpass both the C.P.R. mainline and the Crowsnest Trail. Access or egress to the Crowsnest Trail is not anticipated.

#### 3.1.6 Other External Roads

With the exception of 1st Avenue South, west of 9th Street, and 2nd Avenue A North west of 9th Street, the proposed corridor network does not directly affect any of the other existing roads immediately adjacent to the Primary Study Area. As mentioned, 2nd Avenue A North is unlikely to tie into 9th Street from the west and 1st Avenue South will be terminated at approximately 12B Street and will tie into this street.

### 3.2 TRANSPORTATION NETWORK IMPACT ASSESSMENT

#### 3.2.1 Site 1

- Size: Approximately 5.5 acres developable
- Shape: Triangular
- Slope: Negligible
- Exposure:
- a) Crowsnest Trail (2001 AADT\* 35000)
    - Eastbound: effectively no exposure until driver is committed to bypass site and would involve a considerable detour back to gain access.
    - Westbound: exposure acceptable and is sufficient to permit vehicles to commit safe movement to the site via 9th Street.
  - b) 9th Street (2001 AADT 16000)
    - Northbound: visibility to northbound traffic is similar to that experienced in any downtown situation.
    - Southbound: visibility for southbound traffic is good provided adequate building height and/or signage is provided.
  - c) 1st Avenue South (Minimal traffic)
    - Eastbound: visibility for eastbound traffic west of 9th Street intersection is reasonable; east of 9th Street intersection is excellent.
    - Westbound: visibility for westbound traffic is excellent along site frontage.
- Access:
- a) Regional: Excellent
  - b) Area: Limited to intersection of 9th Street and 1st Avenue South and the local grid streets from the south.

---

\* AADT refers to Average Annual Daily Traffic in the year 2001.

c) Site: Excellent as a result of full frontage access potential along 1st Avenue South and anticipated low traffic volumes on this section of the street.

Wastage: Eastern tip.

### 3.2.2 Site 2

Size: Approximately 9.4 acres.

Shape: Roughly triangular

Slope: Banked along Highway 3 and western end of 1st Avenue South; parcel rises from south to north.

Exposure: a) North Scenic Drive (2001 AADT 24,500)  
 Northbound: visibility limited to that typically encountered in a downtown situation, i.e. not until the intersection with 1st Avenue South.  
 Southbound: not visible to southbound traffic.

b) 1st Avenue South (2001 AADT 5000)  
 Eastbound: visibility excellent along site frontage.  
 Westbound: visibility excellent, but traffic volumes are limited to access to Site 3 and the Brewery or that traffic approaching the intersection of North Scenic Drive.

Access: a) Regional: excellent  
 b) Area: limited to use of 1st Avenue South.  
 c) Site: good as a result of frontage on 1st Avenue South and the anticipated low traffic volumes on this section of the Avenue.

Note: The proposed railway spur which traverses the site does not facilitate rail service to the site, and tends to hamper site exposure.

Wastage: Western tip where railway and existing Highway 3 converge.

### 3.2.3 Site 3

Size: Approximately 22.5 acres in total, of which approximately 7.5 acres is below top of slope.

Shape: Entire site irregular; portion above top of slope rectangular.

Slope: Steep slopes along western edge.

Exposure:

- a) North Scenic Drive (2001 AADT 24,500)
  - Northbound: not visible
  - Southbound: visible prior to turning movement requirement.
- b) Crowsnest Trail (2001 AADT 9000)
  - Eastbound: exposure extremely limited
  - Westbound: not visible
- c) 1st Avenue South Extension (2001 AADT 5000)
  - Eastbound: exposure limited to western extremity of development.
  - Westbound: limited to site related traffic only as westbound movement permitted for Site 3 access only.

Access:

- a) Regional: excellent.
- b) Area: good with access potential at eastern side of site.
- c) Site: limited to two access points at opposite ends of the site. Access is further constrained by the anticipated relatively high volume of traffic along

North Scenic Drive, which will necessitate the provision of a signal controlled intersection.

Wastage: Minimal.

#### 3.2.4 Site 4

Size: Approximately 48.0 acres.

Shape: Rectangular, slightly tapering to the east.

Slope: Negligible

Exposure:

- a) North Scenic Drive (2001 AADT 24,000)
  - Northbound: visibility marginally better than that typically encountered in a downtown situation.
  - Southbound: not visible to southbound traffic.
- b) Crowsnest Trail (2001 AADT 31,000)
  - Eastbound: reasonable visibility
  - Westbound: good visibility
- c) 9th Street (2001 AADT 9,000)
  - Northbound: visibility limited to that typically encountered in a downtown situation.
  - Southbound: visibility for southbound traffic is good.
- d) 1st Avenue South
  - Eastbound: visibility for eastbound traffic is excellent along site frontage.
  - Westbound: visibility for westbound traffic is excellent along site frontage.

Access:

- a) Regional: excellent
- b) Area: Access limited to right-in/right-out off North Scenic Drive, and to access

off 1st Avenue South. Considering the size of the site this access arrangement could limit site development potential and design.

- c) Site Access: the majority of access to the site will be off 1st Avenue South. To date no traffic projections are available to indicate the projected traffic volumes along the section of 1st Avenue fronting the site. Since 1st Avenue South forms the major link with the new Highway Corridor and the Central Business District, it seems likely that it will be utilized as a distribution roadway which could result in high traffic volumes. The magnitude of traffic will determine the number, location and type of access/egress points to service the subject site.

Wastage: Nil

### 3.2.5 Site 5A

Size: Approximately 4.6 acres developable.  
 Shape: Irregular, but generally all usable.  
 Slope: Negligible  
 Exposure: a) Crowsnest Trail (2001 AADT 35,000)  
           Eastbound: not visible  
           Westbound: moderately visible.  
           b) 9th Street (2001 AADT 16,000)  
           Northbound: highly visible  
           Southbound: visibility limited to that typically encountered in a downtown situation, i.e. not visible until the intersection with 2nd Avenue A North.

- c) 2nd Avenue A North
  - Eastbound: excellent
  - Westbound: excellent

## Access:

- a) Regional: good
- b) Area: Moderate, owing to limited approach and anticipated traffic volumes on 9th Street at the intersection with 2nd Avenue A North.
- c) Site: Good as a result of full frontage access potential along 2nd Avenue North, however, access potential on the Avenue may be limited due to potentially high volumes of traffic that may be generated as a result of the 13th Street - Crowsnest Trail no turns grade separation.

## Wastage:

Southeastern tip where mainline and industrial spur converge.

3.2.6 Site 5B

- Size: Approximately 1.2 acres developable.
- Shape: Elongated triangle.
- Slope: Negligible.
- Exposure:
  - a) Crowsnest Trail (2001 AADT 35,000)
    - Eastbound: moderate to poor
    - Westbound: not visible
  - b) 9th Street (2001 AADT 16,000)
    - Northbound: highly visible
    - Southbound: visibility limited to that typically encountered in a downtown situation. However, for all intents and purposes it is not visible as it is not accessible once past 3rd Avenue North.



- c) 2nd Avenue A North (negligible traffic)  
Eastbound: visible  
Westbound: visible

- Access:
- a) Regional: moderate
  - b) Area: very poor, as a result of no direct connection to the major road system.
  - c) Site: good as a result of full frontage access potential along 2nd Avenue A North.

Wastage: Western tip specifically, but generally entire site.

### 3.3 TRANSPORTATION ISSUES

The transportation network assessment/impact analysis has been carried out as far as possible at this time. However, in order to evaluate the operational characteristics of access/egress to the various parcels it will be necessary to:

- a) Ascertain peak hour flows on relevant portions of 1st Avenue South and 2nd Avenue A North from which access to Sites 4 and 5A are derived, as development capacity may be affected in both instances; and
- b) Determine a more precise land use (i.e. it is not sufficient to identify land use by broad category such as Highway Commercial). As illustrated below, peak hour traffic flows differ greatly for specific uses:

<u>Land Use</u>	<u>Vehicle Trip Ends*</u>
Service Station	25 trips/peak hour/station
Shopping Centre (less than 100,000 s. ft.)	820 trips/peak hour/centre
Discount Store	3.3 trips/peak hour/1000 sq. ft.
High Turnover Sit Down Restaurant	10.5 trips/peak hour/1000 sq. ft.
Drive In Restaurant	31.6 trips/peak hour/1000 sq. ft.
New Car Sales	80 trips/peak hour/site
Residential (Apartments)	0.7 trips/peak hour/dwelling unit

Depending upon the precise type of use proposed in the ultimate evaluation of development applications, there is a potential for a problem at the following intersections:

- a) 1st Avenue South and 9th Street
- b) 1st Avenue South and North Scenic Drive
- c) 2nd Avenue A North and 9th Street

The anticipated flows at these intersections may dictate a constraint on the specific land use permitted. In addition, traffic volumes at the all turns intersection on North Scenic Drive to Site 3 could possibly result in the major access to this site being shifted to the 1st Avenue South extension (old Highway 3). This in turn may dictate the carrying capacity of Site 3.

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\* Trip Generation and Information Report  
Insitute of Transportation Engineers, 1976

## 4.0 UTILITIES

### 4.1 INTRODUCTION

This section of the report addresses the provision of utilities to the perimeter of the six (6) sites under study.

### 4.2 WATER SUPPLY AND DISTRIBUTION

The City of Lethbridge Public Works Department has confirmed that the water supply and distribution system in the vicinity of the Railway Relocation Lands is capable of delivering water to service the site when fully developed.

On the basis of the General Municipal Plan Background Study, completed in January 1980, the recently upgraded water treatment plant, which draws water from the Oldman River, has sufficient capacity to serve the City's projected population to 1996 and beyond.

A 24" diameter trunk water main presently traverses the site in the vicinity of 5th Street South (refer to Map 8). This main, together with the 8"/10" diameter main on 1st Avenue South and the 6"/8" diameter main on 2nd Avenue A North will provide water supply to the Railway Relocation Lands.

During construction on the redeveloped site or development of the transportation corridors, it may be necessary to relocate the existing 24" diameter main in the vicinity of 5th Street South. However, since this work would be fairly expensive, attempts should be made during site planning to avoid any disruption to this main. Presently as shown on Map 8, a 2" diameter main runs east-west just north of 1st Avenue South. This main



was initially installed for fire fighting at the C.P.R. Trestle Bridge. The line can be readily relocated to the extent required by final development concepts.

It is not anticipated that booster pumps will be necessary other than those which are normally installed as part of any high rise development.

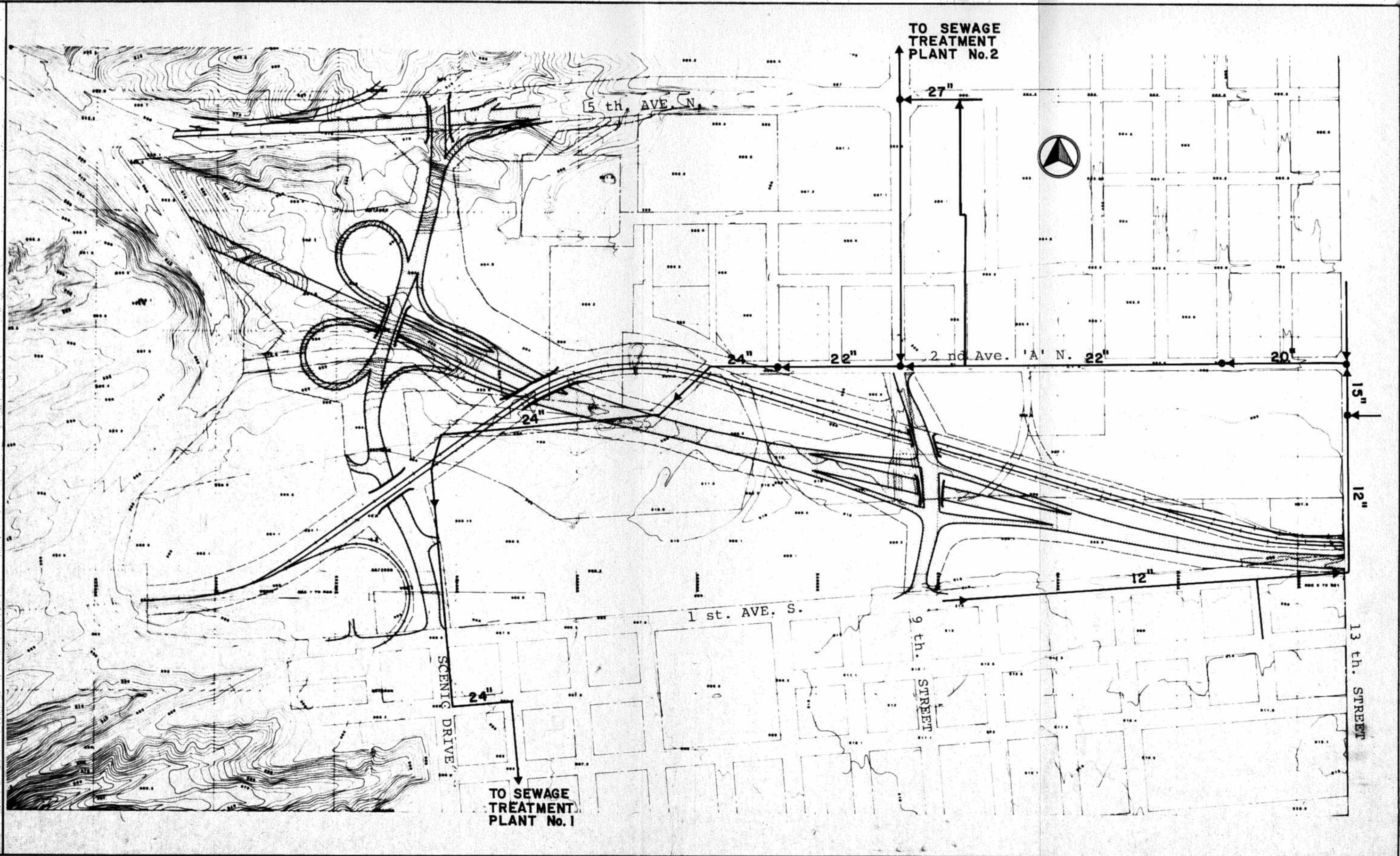
Reference to the adequate capacity of the present area water supply and distribution system is based on the full range of land use alternatives examined in the course of developing land use concepts for the relocation lands. Connection of individual sites to the existing system can generally occur anywhere along the existing mains, subject to relocation of the 24" main. Relocation of the latter, if required in the course of transportation corridor development, would most conveniently occur in an alignment adjacent to the transportation corridors and planned concurrently with any adjustment to sanitary sewer trunks (see Section 4.3)

#### 4.3 SANITARY SEWAGE COLLECTION AND DISPOSAL

The Primary Study Area is located within the area of the City originally proposed to drain to Sewage Treatment Plant No. 2. The City has proposed that this continue and that the entire site discharge its sewage into the sewer at 2nd Avenue A North in the lane between 10th Street North and Stafford Drive (refer to Map 9). This sewer, which is at a depth of approximately 27 feet, eventually discharges to a 27" diameter sewer running north on 9th Avenue North. The depth of this latter sewer should provide sufficient gradient for discharge of the entire area to this point. However, should a small portion of the area be at elevations which restrict the use of this sewer, detailed evaluation should be undertaken to determine if there is a potential for discharge to the network which outlets to Treatment Plant No. 1



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**RAILWAY RELOCATION LANDS**  
**EXISTING SANITARY SEWERS**

The City of Lethbridge, Alberta.

REV.	BY	DATE	DESCRIPTION

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CHECK	ACTIVITY	1:6000	81005-9



Presently, a forcemain servicing approximately six industries has received segments of the collection system to Treatment Plant No. 2. The City has indicated that the resultant residual capacity, of some 1 MIGD\*, is therefore available to convey flows from the Railway Relocation Lands. It is premature to determine the exact amount of sewage which will be generated on site until detailed land use types and development densities are established. However, after reviewing a wide range of potential site uses and development mixes, it appears that the average daily flow generated on the subject Railway Relocation Lands will vary between 0.6 MIGD and 0.8 MIGD. Since this amount is less than the residual capacity available, the entire site may discharge to the north so long as sufficient gradients are achieved.

However, should land elevations restrict this alternative, it may be to the City's advantage to allow a small portion of the area to discharge south to Treatment Plant No. 1, rather than maintain a sewage lift station.

Since Treatment Plant No. 1 will likely be phased out of operation in 1985-86, due to environmental concerns, attempts should be made to discharge to Treatment Plant No. 2 whenever possible. Also, the 18" diameter and 24" diameter syphons connecting Treatment Plants 1 and 2 may eventually require upgrading, so any measures which reduce the quantity of sewage carried by these components should be encouraged.

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\* Million Imperial Gallons per Day

#### 4.4 STORM DRAINAGE

The Railway Relocation Lands fall within the storm sewer drainage area roughly bounded by 5th Avenue North, 4th Avenue South, the city limits on the east, and the Oldman River Valley on the west.

Two existing storm sewers (indicated on Map 10) are located in the vicinity of the subject lands. These are a 15"-20" diameter sewer on 1st Avenue South and a 48"-60" diameter sewer on 2nd Avenue A North, with capacities of approximately 4 and 100 CFS\* respectively.

Since the present topography of the site is flat and largely pervious, the runoff from this area is minimal due to the effects of ponding and infiltration. However, with the redevelopment of the individual sites, the amount of impervious area and resultant runoff potential will be increased.

This additional runoff may be handled in a number of ways, including constructing additional outlet capacity and/or storage of excess flows on site.

Based on potential development use and densities, it is estimated that the uncontrolled post-development runoff for the site might be in the order of 105 to 120 CFS. This peak flow may be reduced to pre-development levels of approximately 50 CFS using storm water techniques such as infiltration basins, roof top, and parking lot storage. The reduction of peak flows to pre-development conditions would require a storage volume of 28,000 to 51,000 C.F. or 0.6 to 1.2 acre feet. It is not anticipated that this amount of storage would be difficult to provide over a site acreage of some 50 acres. Without such stormwater management practice, the following problems may be experienced:

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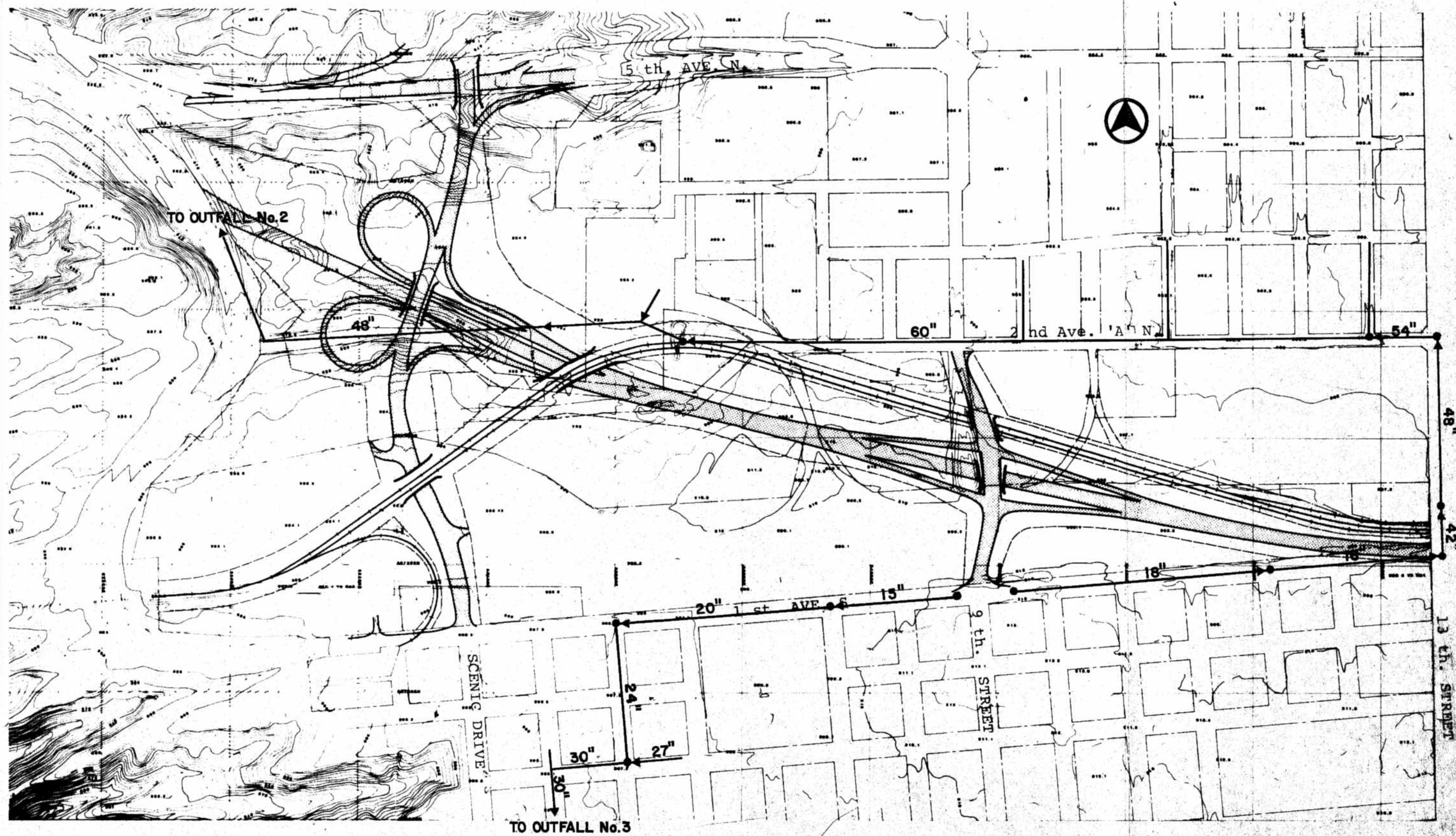
\* Cubic Feet per Second

- a) lowered ground water table producing adverse conditions for vegetation;
- b) increased erosion of receiving streams due to increased peak flows and velocities;
- c) increased sedimentation with both urban and rural pollution discharged from the catchment area to receiving streams;
- d) increased runoff quantities resulting in greater potential for flooding;
- e) larger storm outlets requiring additional capital costs.

Storm water management practices will therefore not only reduce capital costs but also protect the environmentally sensitive coulees, and are recommended for the redevelopment of this site. The principle of detention or retention facilities should be reviewed at the detailed development planning stage.

Assuming that flows are limited to pre-development conditions, then the peak flow to be conveyed from the site, based on preliminary analysis, is approximately 50 CFS. The 15"-20" storm sewer south of the site, which has a capacity of approximately 4 CFS, is unable to convey this amount of discharge. The 48"-60" storm sewer north of the site, with a capacity of approximately 100 CFS, is already experiencing flooding problems due to excess flows from existing areas. The City has therefore suggested that a storm sewer, discharging to the Oldman River, be constructed within the Highway 3 corridor to serve the redevelopment site and alleviate present flooding concerns. In order to determine the size of the proposed sewer it may be necessary to undertake an analysis of the existing system deficiencies to determine the magnitude of the required relief measures.

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**RAILWAY RELOCATION LANDS**  
**EXISTING STORM SEWERS**  
 The City of Lethbridge, Alberta.

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The Route Location and Functional Planning Study of the Crowsnest Trail indicates a relocation of the 48" - 60" diameter sewer west of 7th Street as an integral part of the road and railway corridor program. The proposed 1500 mm (60") storm sewer alignment shown in the above study shifts northerly from 7th Street generally following the northern boundary of the realigned C.P.R. mainline right of way to its intersection with the Crowsnest Trail, then westerly within the Crowsnest Trail right of way. The portions of the existing 48" - 60" diameter storm sewer situated within the corridor rights of way are shown to be abandoned as a result of the above relocation. However, the portion of the existing 48" storm sewer situated outside the corridor right of way in the northwest extremity of Site 3 is not shown as abandoned and may be used to provide the necessary storm drainage for Site 3.

In addition the Functional Planning Study shows a proposed 900 mm (36") diameter storm sewer in the Crowsnest Trail right of way east of 9th Street, a 1050 mm (42") - 1200 mm (48") diameter storm sewer in the Crowsnest Trail right of way west of 9th Street tying into the proposed 1500 mm (60") diameter storm sewer. This facility provides storm drainage discharge potential for all railway relocation lands lying east of the proposed North Scenic Drive. The final location of the storm sewer connections proposed will be determined by the ultimate development proposals.

With the exception of Site 3, installation of the proposed sewers will be required prior to site redevelopment. The Project Agency may make a contribution to the storm sewer commensurate with the requirement created by the increased intensity of use as a result of redevelopment.

#### 4.5 ALBERTA GOVERNMENT TELEPHONES

The main feeder cable route which presently services northeast Lethbridge and the surrounding area crosses the C.P.R. Rail Yards in a twelve duct conduit located to the west of the existing 9th Avenue bridge, as shown on Map 11. Work undertaken on the 9th Street and Highway No. 3 - C.P.R. corridor will necessitate the relocation of this conduit.

A.G.T. have indicated that the desirable location for a new conduit would be on the east side of the relocated 9th Street, where it crosses the railway land, and linked back into the existing conduit at 2nd Avenue A North.

Presently, the duct is only located on the east side of 9th Street South between 4th Avenue South and 2nd Avenue South, but it may be extended on the east side of 9th Street between 2nd Avenue South and 2nd Avenue A North. A.G.T. have indicated that the cost of relocation between 2nd Avenue South and 1st Avenue South would be borne by the utility.

There appears to be two options for traversing the site with the main feeder cable. The first would utilize a duct system for the cable incorporated into the bridge structure. The second would require the cable to be buried under the Highway No. 3 - C.P.R. corridor.



Should the final alignment of the bridge structure be such that a sufficient offset is not provided, the cable will need to be relocated according to Option No. 2. Where the cable is located within an existing road right-of-way, it is imperative from a safety and maintenance point of view that the boulevards adjacent to the road be relatively flat around A.G.T. manholes to allow direct access for service vehicles.

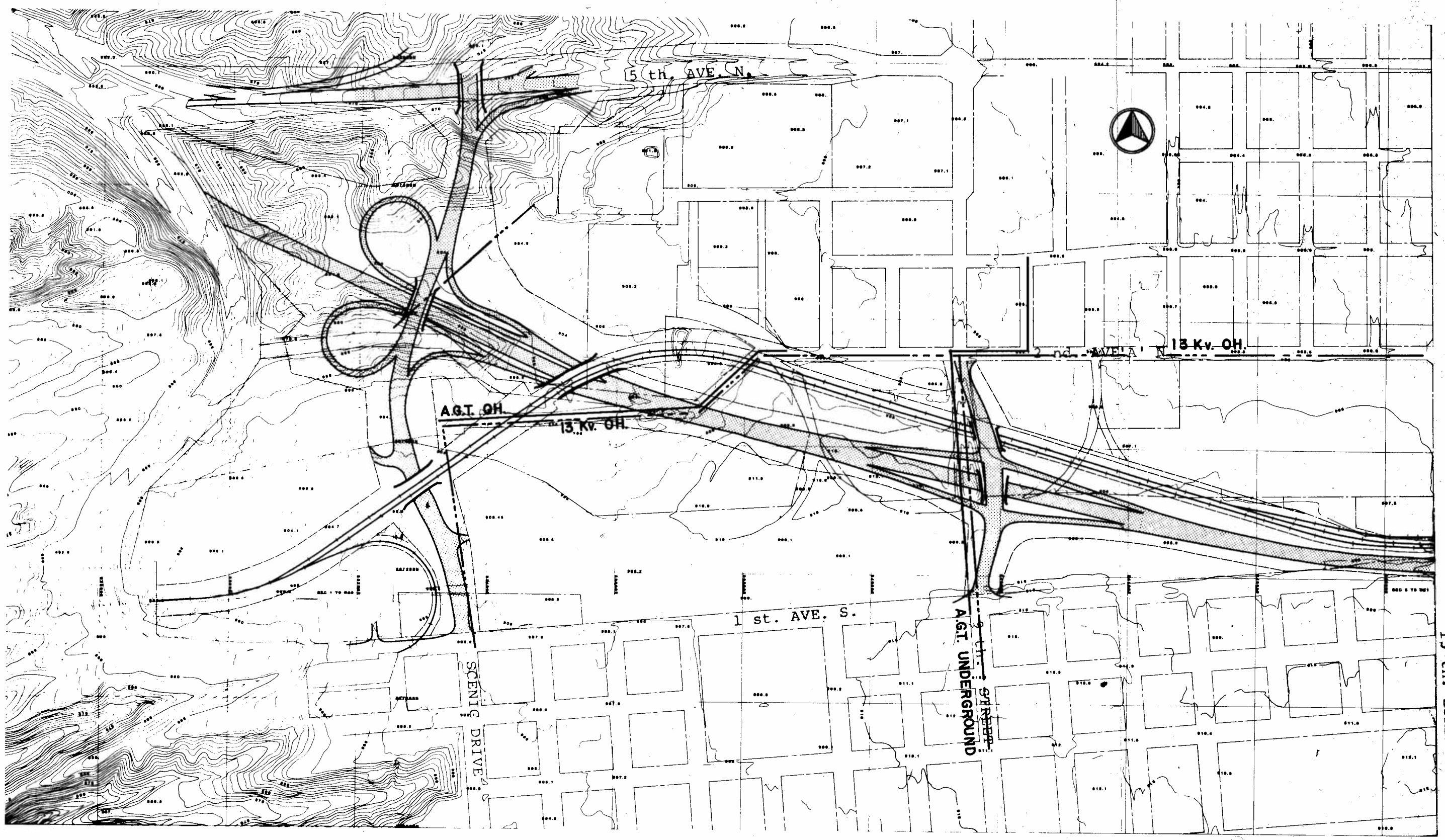
Approximately 1 year notice is required to plan the construction activities associated with movement of the duct. A.G.T. have indicated a cost of approximately \$1.5 million - \$2.00 million and a construction time of 1½ months. The cost, to be borne by the Crowsnest Corridor Road Authority however, is subject to further review by A.G.T. This does not include relocation costs between 2nd Avenue South and 1st Avenue South which, as stated above, will be borne entirely by A.G.T.

The main toll-cable to Fort Macleod and Calgary is located, at a depth of approximately 1 metre, on 1st Avenue South. Development of North Scenic Drive may result in disruption to this cable at approximately 1st Avenue South and 2nd Street South. A.G.T. require at least a month notice to plan any necessary relocation of this cable and estimate construction costs to be in the order of \$10,000.

At the northern boundary of the site, there is presently an A.G.T. overhead transmission line providing local service to the existing yard. This line will be removed as part of the normal construction activities.

It is anticipated that the A.G.T. microwave tower will likely be phased out of operation within 5 years.

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**RAILWAY RELOCATION LANDS**

**EXISTING A.G.T. & POWER**  
 The City of Lethbridge, Alberta,

REV. BY	DATE	DESCRIPTION	DRAWN CHECK	DATE ACTIVITY	SCALE	DRAWING NO.
					1:6000	81005-11

The on-site distribution system may be located in joint conduits with the electrical system along internal roads. Within the proposed time frame for redevelopment, A.G.T. does not foresee any difficulties in providing service to the site for presently proposed land uses and development densities.

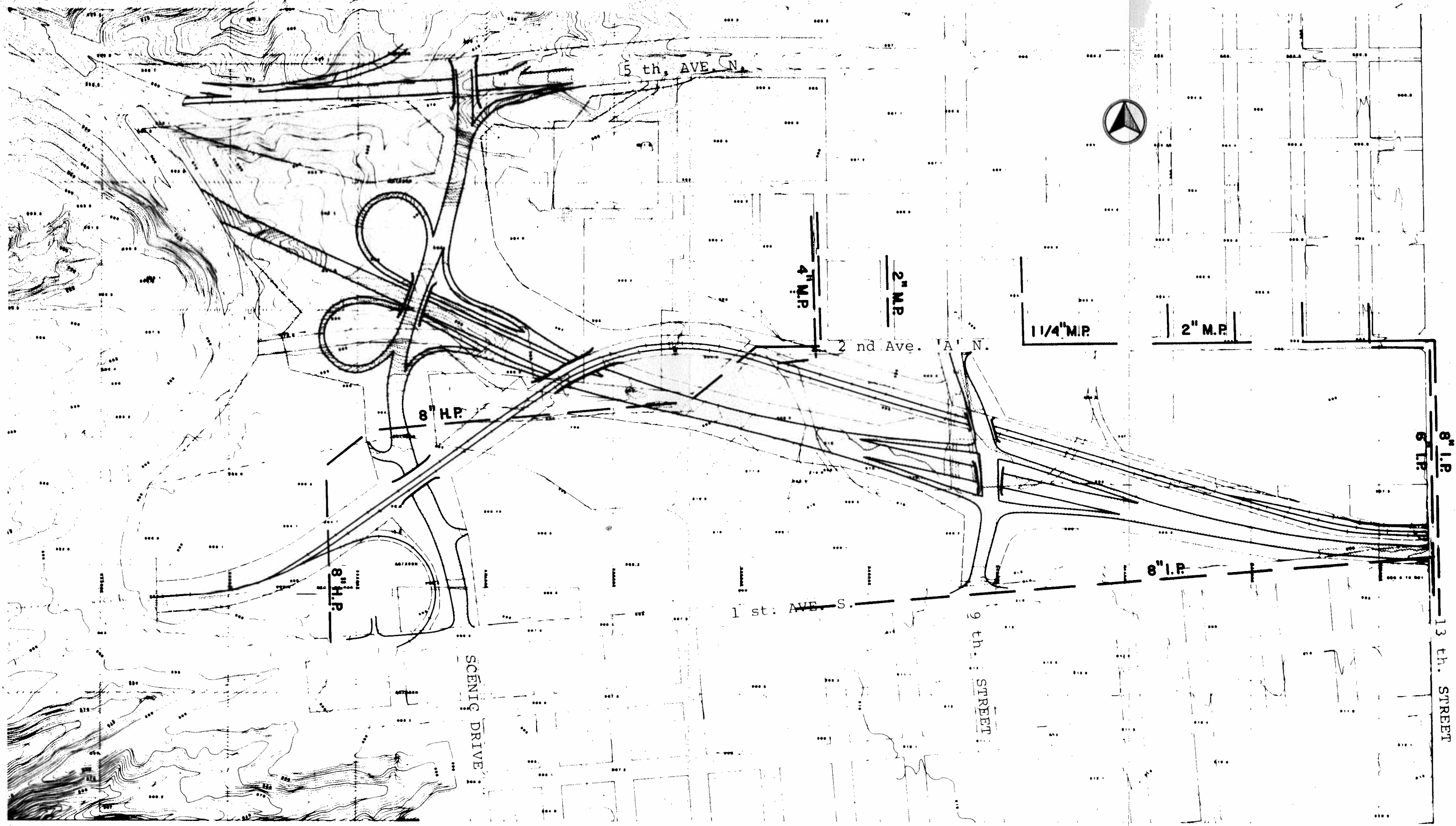
#### 4.6 CANADIAN WESTERN NATURAL GAS

There are presently two Canadian Western Natural Gas trunk facilities which may be affected by redevelopment of the subject lands. These include an 8" diameter high pressure main in a 20 foot easement crossing the northern and west portion of the Primary Study Area and an 8" diameter intermediate pressure main along 1st Avenue South as indicated on Map 12.

The 8" high pressure main, in particular, may affect development of sites 2 and 3 and may require relocation. The utility company has suggested a 50 foot separation from the centre line of a high pressure main and any building or activity attracting a large number of people. It was also noted that a high pressure gas main cannot be relocated within a rail right-of-way.

The utility does not foresee any difficulty in providing natural gas to the proposed site. The existing distribution lines servicing the existing railway buildings will be removed, as required, in conjunction with the redevelopment. All construction costs associated with the relocation of the natural gas facilities will be borne entirely by the City and/or developers with appropriate allocation of costs to be negotiated.

71a



H.P. - HIGH PRESSURE  
 M.P. - MEDIUM PRESSURE  
 I.P. - INTERMEDIATE PRESSURE

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**RAILWAY RELOCATION LANDS**  
**EXISTING GAS MAINS**

The City of Lethbridge, Alberta.

REV. BY	DATE	DESCRIPTION

DRAWN	DATE	SCALE	DRAWING No.
		1:6000	81005-12

CHECK	ACTIVITY

#### 4.7 ELECTRICAL POWER

As indicated on Map 11, two 13kv. transmission lines presently traverse the site. The first runs north as an overhead line on 2nd Street South to approximately 2nd Avenue A North, then east along 2nd Avenue A North. The second, which is part of an emergency backup system, is contained in a duct located in the 9th Street bridge structure. It should be noted that the 138 kv. line west of the site will likely not be affected by the redevelopment of the site.

The policy of the utility with respect to line relocation may be summarized as follows. There is no charge to the developer requesting the relocation when the transmission line is overhead. Where the line is underground or within a duct, those parties requesting the change are responsible for the full construction cost. Therefore, according to these guidelines, approximately 1300 feet of the 13 kv. overhead line south of 2nd Avenue A North will be relocated at the utility's expense. However, the provision will need to be made for maintenance of a backup system on 9th Street either as an underground line or in a duct system which is part of the proposed 9th Street bridge structure. Any underground relocation would require a 10 foot easement free of structural encroachment.

The utility has indicated that in order to service the proposed redevelopment a sub-station will be necessary. Initially they indicated that they will require a parcel of land, a minimum size of 30 metres by 30 metres, either within or external to the site, on which such an F-6 type station may be constructed. They are now considering a less expensive type of sub-station which would require a site approximately 80 metres by 80 metres. However, the final decision will depend on land costs. The utility

typically buys this parcel of land from the owner and builds the station at its own expense. In order to provide such a facility it requires at least three years advance notice for construction planning.

With the construction of the sub-station, suitable electrical power will be available to the redeveloped site.

#### 4.8 UTILITY LOCATIONS

The locations of utilities shown within the study area have been obtained as a result of discussions with various utility companies. The exact location of each utility will therefore have to be determined by field survey. In addition to the utilities indicated on the drawing, certain local lines are currently in the area for servicing such items as the round house. These are not indicated on the map as these will be removed upon redevelopment.

All existing utilities that lie within the proposed road/railway corridors will be relocated, as necessary, as an integral part of the road/railway corridors construction program.

## 5.0 AREA REDEVELOPMENT PLAN

The general land uses for the area and their relationship with the transportation network are outlined on Map 13. It should be noted that the acreages, and population/density proportions specified, are approximations and are subject to refinement during the approval and development process.

### 5.1 DEVELOPMENT GOALS AND OBJECTIVES

The General Municipal Plan states "it is assumed that, in the long term, rail relocation will occur and that redevelopment of the yards will be more or less in accordance with the scheme (the term "scheme" refers to the aforementioned Option 6\* Redevelopment Plan which was adopted by Council as Railway Relocation Scheme Bylaw 3398). Two overriding goals identified in the scheme, relating specifically to Railway Relocation but which are applicable to this Area Redevelopment Plan are:

- ° To maintain and expand the function of the Lethbridge Central Business District as the major service centre for the City and southwest Alberta; and
- ° To encourage and support improvements to the physical, environmental and social qualities of the Downtown for visitors, shoppers, residents and workers.

It should be pointed out that although the specific objectives identified in the "scheme" have provided a fundamental basis for this document, some have been modified to reflect changing conditions. For example, the scheme initially proposed institutional and quasi-public uses for Site 3, however, no such prospects have been identified. Instead, private development prospects for medium density residential have surfaced.

\* Lethbridge Railway Relocation Study Examination of Alternative Development Options, Damas and Smith Limited, August 1976



More specific redevelopment plan goals and objectives have been formulated based upon interpretation from statements of current municipal policy and suggestions by an Advisory Committee especially established for this purpose. These are:

- Support the maintenance of downtown Lethbridge as the commercial focus of the City's sub-region and call for the prevention of any regional or community shopping centres which would detract from the dominance.
- Support the development of a vibrant, multi-use downtown.
- Support the northerly extension of the Northwest Parkway (North Scenic Drive) across the subject area.
- Support the design of the proposed Highway 3 corridor as a community arterial.
- Support restrictions on development within or adjacent to valley lands, and call for the possible requirement of impact statements assessing the effects of the development on both the natural environment and the surrounding community.
- Increase accessibility to the downtown.
- Increase the variety of activities in the downtown particularly outside of normal working hours.
- Increase accessibility of the central area to the river valley recreational lands.
- Encourage and integrate development compatible with existing and surrounding land uses.
- Preserve and encourage the existing C.P.R. Station as an historic site.
- Encourage the use of good building design, including attention to view, wind and sun considerations.

## 5.2 SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

The opportunities and constraints affecting the plan which were identified in previous sections of the report, as well as some additional ones, are summarized below:

### 5.2.1 High Pressure Gas Line

An 8 inch high pressure gas main traverses Site 2 and infringes upon Site 3. The line should either be relocated or, if retained in place, provided proper separation from residential or other uses attracting an assembly of people. The utility has suggested a 50 foot building setback from the centre line of such a facility.

### 5.2.2 C.P.R. Mainline

Any residential development adjacent to the C.P.R. mainline must take cognizance of this facility, not only from a noise perspective but also from a visual one. This should include such design and building considerations as berming, spatial separation, building orientation and construction. Since there has been no contemporary residential development precedent in Lethbridge, City Planners have recommended that the south attenuation guidelines established by Canada Mortgage and Housing Corporation<sup>1</sup> be used as preliminary guidelines. Given the proposed track elevations across the western portion of the site, substantial berms would be required in order to deflect the rail noise. Alternatively, the necessary attenuation may be achieved through a variety of combinations of separation, berming, fencing, orientation, and construction technique. Attenuation provisions should therefore be dealt with when specific development proposals are prepared.

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<sup>1</sup> Road and Rail Noise: Effects on Housing Central Mortgage and Housing Corporation NHA 5156 12/79

Discussion with Alberta Home Mortgage Corporation has also indicated that any projects financed by this agency will have to abide by the CMHC guidelines.

#### 5.2.3 Water Main

The 24 inch water main which traverses Site 4 may be incorporated in the detailed site layout or relocated to an alignment to be determined at the detailed planning stage. If the main is to remain, an easement provision is required and any development over the easement must allow access to the easement and the water main. Parking lots, internal roadways, open space and pedestrian ways may be developed above the utility.

#### 5.2.4 C.P.R. Station

The existing C.P.R. station structure, situated in Site 4, should be retained and incorporated in the final development concept as a designated historic site. Renovation of the structure for conversion of its use would be subject to preservation of its historic character and architectural merit.

#### 5.2.5 Telecommunications Tower

The CNCP Telecommunications tower, located in parcel 1, receives a signal beamed in from a tower located to the east of Barons, which is approximately 40 kilometers northwest of Lethbridge. The tower in Lethbridge and the beam are situated approximately 35 feet above ground. In order to ensure against any disruption of the signal, a building clearance of 10 to 15 feet from the site line is desirable. The actual building height allowable

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1 Road and Rail Noise: Effects on Housing  
Central Mortgage and Housing Corporation  
NHA 5156 12/79

depends upon the ground elevation of the building. Buildings constructed to the north of the installation must be restricted in height so as not to disrupt the "line of sight" between the tower in Lethbridge and the one near Barons. In addition, the facility itself will have to be incorporated with the development in parcel one.

#### 5.2.6 Geotechnical Investigations

Preliminary geotechnical investigations have identified three areas of concern:

- a) subsidence due to abandoned coal mines,
- b) slope stability, and
- c) fill areas.

These issues affect mainly Sites 2 and 3 and the western portion of Site 4. Appropriate detailed geotechnical documentation will therefore be required in conjunction with specific development proposal applications.

#### 5.2.7 Restricted Development Area

The Restricted Development Area Zoning affecting Site 3 will require negotiations with the Province prior to approval of any intensive development. Since the designation of this zone was initially requested by the City, removal of the restrictions should not present any problems so long as it can be supported by sound and substantive reasons. There are two examples in Lethbridge where the RDA has been amended following detailed geotechnical investigation.

### 5.3 PROPOSED LAND USE

For ease of discussion, Railway Relocation Lands are broken down into six sites on the basis of the major transportation network. The plan's land use components are thus addressed on a site by site basis.

#### 5.3.1 Redevelopment Site One

Site 1, a triangular parcel comprising approximately 5.5 gross acres, is bounded by the proposed Highway 3 corridor and the existing 1st Avenue South and 9th Street. Existing development to the south is a mixture of commercial and light industrial uses influenced originally by the railway presence and more recently by commercial development potential deriving from proximity to the downtown and to 3rd Avenue South.

The site is distinctly separated from the existing downtown retail core but is nonetheless centrally located relative to the City's transportation network. High intensity commercial or residential use would be ruled out in the short term by the separation from the core and by the influence of adjacent transitional uses to the south.

The existing exposure of the site is limited. Development of the Highway 3 corridor and improvement of the 9th Street corridor will enhance its exposure to cross-town and regional traffic movement. However, the interchange configuration at 9th Street and the Highway corridor, and the depressed alignment of the Highway corridor, will restrict the visibility of the site to adjacent traffic. Furthermore, the ramp requirements of the proposed diamond interchange and the proposed elevation of 9th Street eliminate any possibility for direct access (right in and right out only) to the site from either of the two roadways. Existing 1st Avenue

South will serve as a reverse frontage road, and via 9th Street, will afford access to the site. Assuming 9th Street signage well in advance of the off-ramps at 9th Street, westbound traffic along Highway 3 can turn left at 9th Street and gain access to the site via 1st Avenue South.

Eastbound highway traffic could approach the site via 9th Street and 1st Avenue South as well. However, beyond 9th Street, the opportunity for access to the site is not readily feasible.

The restricted exposure of and access to the site place limitations on highway commercial use. Nevertheless, the most desirable uses are offices or highway commercial in nature, but ones which require minimal exposure from adjacent roadways. A hotel/motel/restaurant facility would be appropriate at the western end of the site.

Subdivision of the site would be based on provision of 1st Avenue South frontage. The available depth from 1st Avenue South at the western end of the site might require the provision of a short cul-de-sac for efficient development of highway commercial uses.

The actual intensity of development cannot be determined until specific development proposals have been given serious consideration. However, the uses and development guidelines contained in but not limited by those in Land Use District C-1, C-2 (Central Business District Commercial) and C-8 Highway Commercial may be appropriate.

The permitted uses for Highway Commercial Districts under the City's Land Use Bylaw include: car washes, service stations, gas bars, motels, motor hotels and public utilities. The discretionary uses include such things as drive-in businesses, drive-in restaurants, eating and drinking establishments, offices and veterinary clinics.

### 5.3.2 Redevelopment Site Two

Site 2 is located south of the proposed railway corridor and west of the North Scenic Drive corridor and contains a total gross area of approximately 9.4 acres. The south brewery spur is situated between the site and North Scenic Drive. The existing brewery dominates adjacent lands to the south. However, the site is centrally located relative to the City transportation network and is very near the Phase 2 Downtown Redevelopment Area.

Existing exposure of the site is enhanced by the present Highway 3 alignment. Following relocation, this highway exposure will be significantly reduced. The proposed North Scenic Drive will provide exposure to major cross-town traffic movement and highway/downtown movement but the separation by the brewery rail spur will restrict the quality of that exposure.

Depth and slope restrictions on the western portion of the site restrict its development potential unless acquired for ancillary purposes by an adjacent user. Despite its exposure to traffic movement on the east, the adjacent rail corridor and rail spur are considered to restrict the development potential for all but controlled light industrial or quasi-commercial uses such as retail warehousing.

The Advisory Committee recommended hotels/restaurants, medium density multi-family housing and Senior Citizen housing and discarded such uses as light industrial and commercial warehousing. However, parcel depth which inhibits the provision of adequate sound attenuation from the C.P.R. mainline, and existing development to the south, constrain residential development potential. It is therefore intended that the uses on Site 2 be of a highway/commercial/light industrial variety as contained in, but not limited to C-8 Highway Commercial Districts and I-1 Light Industrial Districts,



and include such things as hotels/restaurants, offices and retail warehousing. Since Site 2 is strategically located as an entry way to the city via Highway 3, development must be comprehensively planned and architecturally controlled to ensure a quality development.

Approximately 2.5 acres of the site at the western extremity are proposed as open space. Although this area consists of fairly rough terrain and is a narrow parcel, it is especially suitable as open space in that it would enhance the entry image, would complement Brewery Gardens and would improve the open space linkage between the downtown and the river valley. A landscaped pedestrian linkage is proposed along the south periphery of the site.

Access to Site 2 is feasible only from the existing Highway 3 (1st Avenue South). Because the highway slopes rapidly downward to the west and the depth of the site decreases in the same direction, there is little prospect of effective access any further east than the existing Schwarz property.

### 5.3.3 Redevelopment Site Three

Site 3, containing a total of approximately 22.5 gross acres, of which 7.5 acres are below the top of slope line, is located west of the North Scenic Drive between the rail corridor and the proposed highway corridor(s). It is effectively supplemented by existing city-owned lands to the north.

The site will be bounded on the south by the proposed rail corridor and will have limited exposure to the North Scenic Drive and its intersection with the proposed Highway 3 corridor. Due to the valley slopes, the site commands excellent views to the northwest.

A portion of the site, approximately 7.5 acres in the northwest, is deemed "undevelopable" by the preliminary geotechnical investigations, unless proven otherwise by more detailed investigations. The land is tentatively proposed as open space. However, since this area has limited aesthetic value, it may be considered for development so long as any proposal is accompanied by adequate geotechnical data which supports the proposed development/subdivision and is acceptable to the approving authority.

All turns access is available from North Scenic Drive immediately north of the C.P.R. corridor. An additional access is provided at the west end of the site tying in with the present Highway 3 facility. This access will provide movements to and from the City centre via 1st Avenue South and from the west via the present Highway 3.

The site was originally proposed for institutional or quasi-public use, but at the present no specific institutional prospects have been identified. However, these may be considered as alternative uses in the event market conditions are not conducive to private development in the area.

The uses and development guidelines envisioned for site 3 are contained in but not limited to those in Land Use Districts C-1, C-2 (Central Business District Commercial) and R-2 (b) Comprehensive Medium Density Residential District. Private development prospects such as hotels and medium density residential would be appropriate. Such a hotel development might be in the order of 200 rooms. Review of its traffic generation characteristics would probably relate more significantly to provision of ancillary facilities such as convention and entertainment areas. Residential development would preferably be oriented to non-

family housing, as the area is effectively removed from community facilities such as schools and playgrounds. Two pedestrian linkages to Site 4 and the Downtown area are proposed to encourage the necessary interaction and to enhance the access to community facilities. Residential development on this site will be affected by its proximity to the C.P.R. mainline. City of Lethbridge planners have indicated that, in the absence of any formal policy, the Canada Central Mortgage and Housing Guidelines shall be applied. Based upon anticipated train volumes, and assuming that nothing is done in terms of sound attenuation, this could mean a building setback of approximately 200 feet. However there are various methods that may be used for reducing the impact. These will be considered at the development approval stage. While specific guidelines are not currently available, similar attention to the question of highway noise attenuation will also be required.

Specific development considerations and guidelines for the site include:

- ° All development proposal applications must be accompanied by satisfactory geotechnical documentation. This support information should address the following:

- a) abandoned coal mines,
- b) slope stability,
- c) fill material.

All development work, particularly if development is to occur beyond the preliminary development limits, must be carefully co-ordinated with the geotechnical and structural engineering considerations.

- ° All residential development must, in addition to compliance with the local by-laws, adhere to Canada Central Mortgage and Housing Corporation noise guidelines relating to rail and highway noise.

- A visual buffer, as well as any necessary noise attenuation devices, must be provided along the C.P.R. mainline. It should be noted that trees do provide a visual buffer but have minimal impact on sound attenuation.
- The residential building orientation and design must take cognizance of:
  - a) wind and snow effects,
  - b) sun angles,
  - c) sound attenuation,
  - d) slope adaptation,
  - e) open space and pedestrian linkages,
  - f) views.
- Pedestrian linkages to the Downtown should be provided along North Scenic Drive and along the western periphery of the site.
- Any commercial development, other than hotel and ancillary uses, should be local or convenience-oriented.
- Amenities such as swimming pools and tennis courts, built in conjunction with the hotel, must be accessible to the residential enclave. In this way the hotel should serve as a community focal point for the site.
- In the event that portions of the site below the top of slope are deemed developable, a portion of this area should be incorporated as part of the open space network, and be accessible to the public.
- All individual development proposals and phasing must be in accordance with the approved comprehensive development plan of the entire parcel.
- Residential development should consist of low profile (2½ to 3 storey) multi-family townhouses and apartments. Where located at or below the top of slope, the housing modules would be terraced, preferably according to the slope and away from the Highway so as to lessen the visual impact on incoming traffic.

Assuming a gross residential density of 45 units per acre the site can accommodate up to 400 residential dwelling units in addition to a hotel complex.

#### 5.3.4 Redevelopment Site Four

Site 4, the largest and most centrally located of the redevelopment parcels, contains approximately 48.0 acres. The size of the site and its proximity to the Downtown offer substantial potential for either residential development and for higher order commercial uses such as a regional shopping centre. It is intended that this site be developed as a mixed use area consisting of a major regional shopping facility, high density residential and senior citizen housing and office uses.

A regional shopping facility occupying the entire site is anticipated to have the greatest traffic impact. Assuming a two storey shopping centre structure with at grade parking and a parking ratio of 5.5 spaces per 1000 square feet\* of gross leaseable floor area, the site can, from a development perspective, accommodate a shopping centre approaching 800,000 square feet. This, of course, would assume no residential development. However, the Market Analysis and Development Concept Update identified a potential market for retail commercial development approximating 350,000 square feet of gross leaseable area. This is equivalent to a typical shopping centre anchored by a single major department store. The introduction of a second major department store would allow expansion of the centre to perhaps 500,000 square feet. On this basis three scenarios are identified.

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\* The parking ratio of 5.5 spaces per 1000 square feet of gross leaseable floor area is a standard accepted by the industry for Regional Shopping Centre facilities.

1. Assuming that a 350,000 square foot GLA shopping centre, with at grade parking, is developed, the gross land area requirement would be 25.5 acres. This leaves a residual land area of some 22.5 gross acres for residential development. Assuming a density of 50 dwelling units per area as identified in the Market Analysis and Concept Update, the site could also accommodate 1125 residential dwelling units.
2. Assuming that the shopping centre is expanded to 500,000 square feet GLA with at grade parking the commercial land requirement is 32.0 acres. The residual 16.0 acres could, at a density of 50 units per gross acre, accommodate 800 dwelling units.
3. A third scenario assumes development of a 500,000 square foot shopping centre, with deck parking, confined to approximately 20.0 acres, and a balance of 28.0 acres accommodating 1400 residential units.

A summary of the three scenarios is outlined below:

<u>Scenario</u>	<u>Retail Commercial</u>		<u>Residential</u>	
	<u>Acres</u>	<u>GLA(sq. ft.)</u>	<u>Acres</u>	<u>No. of Units</u>
1	25.5	350,000	22.5	1125
2	32.0	500,000	16.0	800
3	20.0	350-500,000	28.0	1400

In keeping with the overall objectives for the area, the site should be developed as a mixed use area. It should consist of land use mix that is in line with prevailing market conditions and not necessarily in accordance with any of the scenarios outlined.

Access to site 4 is readily available via 1st Avenue South and via extensions of the downtown street grid. The actual connections, however, will be dependent upon more detailed site design. In addition, right in/right out access to the site is feasible from North Scenic Drive at approximately the midpoint between 1st Avenue South and the proposed railway corridor.

From a retail and access point of view, the shopping centre would be most appropriately located at the west end of the site, directly north of the Phase Two Downtown Redevelopment area. An added advantage is that commercial development in the western segment would provide a "buffer" against the at-grade railway corridor. Residential development could then occur at the eastern portion of the site where Highway 3 will be depressed in the ultimate stage and thus have a lesser impact than the railway. If residential development is to occur on the western portion of the site, then both visual and sound buffering will be required.

Commercial development on the west would also facilitate a pedestrian connection to the existing Woodward Centre and would tend to improve development potential of the intervening lands. At the same time, however, the resultant shift of downtown activity would tend to affect the development potential and the vitality of the eastern sector of downtown.

The relationship of the specific uses will be established at the development proposal stage.

It is also anticipated that market conditions will not allow the entire area to develop to capacity at one time, and that the commercial component will be the first to develop.

Specific development considerations and guidelines for Site 4 include:

- ° All development proposals must be accompanied by satisfactory geotechnical documentation with particular emphasis on the small portion in the northwest that was subjected to subsurface coal mining and the small area that was a former sanitary land fill site.



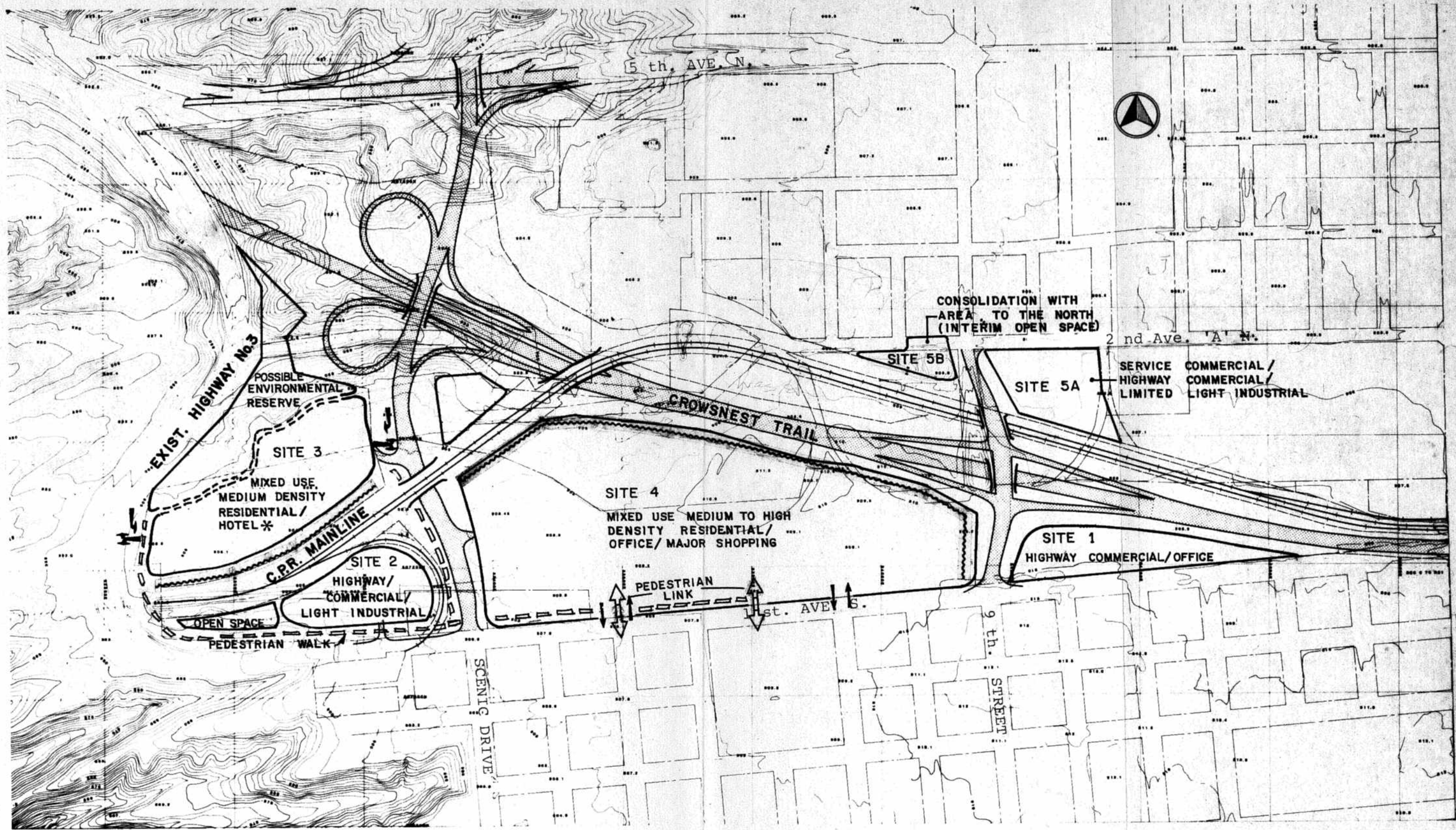
- All residential development abutting the C.P.R. mainline and/or the road corridor must, in addition to the local by-laws, adhere to the Canada Central Mortgage and Housing Corporation Road and Rail Noise Guidelines.
- A visual buffer, in conjunction with any sound attenuation devices, should be provided along the C.P.R. mainline. Again it should be noted that although trees do provide a visual screen, they have a minimal impact on sound attenuation.
- The residential building orientation and design must take cognizance of:
  - a) wind and snow effects,
  - b) sun angles,
  - c) sound attenuation,
  - d) open space network,
  - e) integration with other uses.
  - f) view of Galt Gardens
- Open space provisions should be incorporated with storm water retention ponds.
- The function of Galt Gardens as a regional open space facility must be shown to be reinforced, in part at least through the provision of a major pedestrian link from complementary development in Site 4.
- All individual development proposals must be in accordance with an approved comprehensive development plan of the entire parcel.
- The existing C.P.R. Station shall be maintained as an historic site and incorporated in the site development.
- All development proposals must demonstrate compatible egress and access with the external street system as well as internal circulation.

- ° The regional shopping facility shall serve as an anchor to the Central Business District and must therefore complement the type of development contemplated by the Downtown Phase II Area Redevelopment Plan for that area lying south of 1st Avenue South.
- ° An internal pedestrian network must be provided.

In general terms, development of Site 4 must conform to the objective of a mixed use complex, strengthening the downtown's regional service function and improving central area vitality through the inclusion of a residential element. Ideally, such development would occur concurrently and be guided by an approved comprehensive site design. While market circumstances may dictate an initial priority on the shopping centre component, development proposals will be required to demonstrate adequate design flexibility for the commitment to the ultimate mixed-use concept. In this context, the development scenarios described in this section are intended merely to draw attention to the development capacity and potential of the site. Actual development concepts need not and shall not be constrained by simple two-dimensional zoning of the site to distinguish between residential and commercial components.

#### 5.3.5 Redevelopment Site Five 'A'

Redevelopment of Site 5A, comprising approximately 4.6 gross acres based upon the proposed corridor alignment and rail spur, is recommended primarily for service commercial uses contained in but not limited to uses in the C-4 General Commercial District, such as car dealerships, print shops, computer related enterprises, and consultant offices.



~~~~~ AREA REQUIRING NOISE AND/OR VISUAL SCREENING CONSIDERATION

\* ALTERNATE LAND USES FOR SITE 3 INCLUDE INSTITUTIONAL AND QUASI-PUBLIC USES

**AS** PLANNERS, ENGINEERS AND PROJECT MANAGERS  
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**RAILWAY RELOCATION LANDS**  
**LAND USE CONCEPT**

The City of Lethbridge, Alberta.

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|       |      | 1:6000 | 81005-13    |

It may also include light industrial type uses such as glassworks manufacturing and bakeries, so long as the activity is contained within the building and does not entail any outside storage. These proposed uses are based to a large extent upon the site's proximity to the Centre Village Mall Shopping Centre and the premise that 2nd Avenue A North forms a continuous link between 9th Street and 13th Street. This is especially vital as the only access to the site will be derived from 2nd Avenue A North. A direct access from 9th Street is not possible. Development potential may be restricted by traffic limitations at the 2nd Avenue A and 9th Street intersection. Detailed consideration to traffic and access will be given at the time of development permit application.

The site may either be subdivided into smaller parcels or developed as a single site.

#### 5.3.6 Redevelopment Site Five 'B'

Redevelopment potential of Site 5B is constrained by its area of approximately 1.2 acres. It is greatly influenced by the industrial development to the north and the transportation corridor to the south and is thus considered suitable for an extension of existing light industrial and/or some service commercial activity at its eastern end. Site design will be further restricted by the small size and narrow triangular shape. The feasibility of providing a retaining wall, which would enable 2nd Avenue A North to tie into 9th Street is currently being investigated. If this does not prove feasible, then consideration should be given to closing 2nd Avenue A North west of 9th Street, except for a utility easement, and utilizing a portion of the right of way for development. The site would best be consolidated ultimately with the area to the north, access being provided from 3rd Avenue North. In the interim, minor landscaping improvements should be carried out so as to enhance the visual quality of the site.



## 5.4 RESERVE LANDS

### 5.4.1 Co-Owners Agreement

The lands within the Redevelopment Area which are controlled by the Project Agency are exempted from municipal reserve provisions by virtue of article 7.1.b of a co-owners agreement between the City of Lethbridge and Her Majesty the Queen in Right of the Province of Alberta which states:

"that the Agency will submit to and comply with all normal and usual requirements of the subdivision approving authorities in respect of the Lethbridge Property other than the subdivision requirement pursuant to the agreement to be executed between Marathon Realty Company Limited and the Province and other than the provision of reserves".

### 5.4.2 Normal Reserve Provisions

Section 99 (1) of The Planning Act stipulates that "a subdivision approving authority may require the registered owner of a parcel that is the subject of a proposed subdivision:

- a) to provide part of that parcel as municipal reserve and part as school reserve or as municipal and school reserve,
- b) to provide money in place of municipal reserve and school reserve or municipal and school reserve or any of them, or
- c) to provide any combination of land or money referred to in clauses (a) and (b)".

Section 99 (2) limits the aggregate amount of land provided under subsection (1) to a maximum of "10 percent of the area of the parcel less the land required to be provided as environmental reserve" or, where cash-in-lieu is provided, the total amount of money "shall not exceed 10 percent of the appraised market value of the area of the parcel less the land required to be provided as environmental reserve". The same maximum applies to a combination of land and cash-in-lieu.

#### 5.4.3 Redevelopment Area Circumstances

The circumstances relative to the Railway Relocation Lands may be summarized as follows:

- land dedication is not usually a factor in downtown redevelopment;
- cash-in-lieu has been paid for that portion of the rail operating lands subdivided and transferred to Marathon prior to negotiation of the Railway Relocation Agreement. The remaining operating lands have not been subject to reserve requirements;
- option of additional cash-in-lieu payment is obviated by related financial arrangements between the City and the Province pertaining to rail relocation generally;
- school and/or joint use sites normally secured through municipal reserve provisions are not required in the area;
- the development concept, to the extent that it includes residential uses, does necessitate attention to open space provisions;
- sites located on the escarpment of the river valley require special attention. However, the environmental reserve device is considered appropriate only to the extent that development is confined by geotechnical considerations.

#### 5.4.4 Open Space Opportunity

The Advisory Committee has indicated the desirability of achieving three apparent open space opportunities:

Firstly, the necessary open space provision for residential use in Sites 3 and 4 should be secured in negotiation with development proponents through the vehicle of competitive proposal calls, and should be extended to secure suitable access and maintenance arrangements.

Secondly, an open space use in the western portion of Site 2 should be provided in order:

- to enhance the major regional entry to the City
- to complement Brewery Gardens, and
- to reinforce the link between Site 3 and the downtown, and the Oldman River Valley and the downtown.

Thirdly, development of Site 4 should be evaluated on the basis of resultant enhancement of Galt Gardens as a regional park and open space facility and as a major element in the urban form of the downtown.

#### 5.4.5 Open Space Provision

It is intended that the open space objectives be achieved in the following manner:

- the Project Agency shall ensure that all development proposals involving residential land uses include suitable open space for the use of the residents;
- the Project Agency shall ensure that development proposals integrate the design and development with the Galt Gardens, and
- the City, on receipt of its additional interest in the "west lands", as defined in the Co-Owners agreement, designate approximately 3.0 acres of land as public open space, approximately 2.5 acres of which will be at the western end of Site 2, and the remainder to be



provided as a pedestrian/bicycle way linking Site 3 and the Oldman River Valley with the Downtown. The precise location and dimensions of the latter provision will be specified at the development proposal stage.

Any lands in Site 3 situated below the top of slope and/or safe development limit, which are not released for urban development by supplementary geotechnical data, or which are not required for development as a component of the successful development proposal, will remain under Restricted Development Area Designation.

## 5.5 SCHOOL FACILITIES

Since residential development in the study area, particularly Site 4, is not anticipated for some time, projections of school enrollment provide only an indication of anticipated requirements for planning purposes. The projections and possible accommodation of students were derived from discussions with the respective school board representatives.

### 5.5.1 Projected School Enrollment

The maximum residential development in Sites 3 and 4 would accommodate 400 to 1400 multi-family units respectively. Since the dwelling unit mix anticipated is likely to cater to a high percentage\* of households without children, i.e. singles, childless couples and senior citizens, the current student generation factors used in Lethbridge are not applicable. These would result in a higher projection than would probably occur. The matter is further complicated by the anticipated timing of residential development. Discussions were therefore quite general, relating only to the maximum number of dwelling units that the area would be able to accommodate.

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\* Lethbridge General Municipal Plan Background Report  
Rockliff Partnership Architects Planners  
January, 1980 P. 17

### 5.5.2 Public Schools

The Fleetwood Bawden Public Elementary School, located on 9th Avenue South at approximately 13th Street, would serve the public elementary school population. Currently the school has some space capacity. Furthermore it also serves parts of West and North Lethbridge. If capacity is reached as a result of the Railway Relocation Lands, the School Board may have to accelerate the construction of school facilities in either West or North Lethbridge. This should not pose any short or long term problem.

Hamilton Public Junior High School, also located near the Downtown, would serve the public junior high school population from the Railway Relocation Lands. As with the public elementary school situation, additional enrollment may in the long term accelerate the provision of such a facility in West Lethbridge.

Lethbridge Collegiate Institute, located at 5th Avenue and 18th Street South, would serve the senior high school population. Based upon current population projections for the overall City, this facility along with Winston Churchill High is expected to serve Lethbridge for some time into the future.

### 5.5.3 Separate Schools

It is anticipated that the separate school demand generated by development in the Railway Relocation Lands would be served by the existing facilities. This will, of course, be possible through the utilization of the City Transit's school bus service.

## 5.6 COMMUNITY SERVICES

### 5.6.1 Public Health Services

Public health services are currently provided by the Health Unit at the Central Clinic downtown. This clinic provides a full range of services and would serve the Railway Relocation Lands. The additional demand for services generated by the Railway Relocation Lands would be accommodated by increasing the number of staff.

### 5.6.2 Hospital Services

The General Hospital and the Municipal Hospital currently provide a full range of active treatment hospital services to the City and Region. The General Municipal Hospital intends to increase its size by 300 to 500 beds and change its function to Regional Hospital status. The City of Lethbridge will therefore be well provided with active treatment hospital facilities.

### 5.6.3 Library Services

The Lethbridge Public Library, located downtown (9th Street and 5th Avenue), currently supplies full public library services to the City. Expansion plans to the existing facility are being reviewed as branch operations are not being considered for several years. Mobile operations may possibly service outlying areas once adequate population size is achieved. In any event, the Railway Relocation Lands will be served by the Central library.

### 5.6.4 Police Services

The City of Lethbridge Police Department located downtown (at 5th Avenue and 5th Street South) provides police services to the City. Full police services will be provided to the Railway Relocation Lands from this main station.

#### 5.6.5 Fire Protection Services

Fire protection services to the City of Lethbridge, are or will be provided from the following locations as outlined in the General Municipal Plan Background Report\*.

- "a) Department Headquarters, located in the northeast industrial park;
- b) #1 Station, located downtown on 6th Avenue South;
- c) #2 Station, located in West Lethbridge;
- d) #3 Station, on 16th Avenue South near Mayor Magrath Drive, and
- e) #4 Station, to be constructed in North Lethbridge.

Fire protection services to the Railway Relocation Lands will be provided primarily by Station #1, located downtown, with backup provided by Headquarters.

#### 5.6.6 Ambulance Services

Ambulance service in Lethbridge is provided by the City and operated by the Fire Department. Front-line ambulances are located at the Headquarters unit in the industrial park and at #3 station on 16th Avenue South. In addition, a third unit is being constructed for Station #2 in West Lethbridge.

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\* Lethbridge General Municipal Plan Background Report  
January 1980, p. 85

## 6.0 PLAN IMPLEMENTATION

### 6.1 GENERAL

The Railway Relocation Lands Area Redevelopment Plan, once adopted by City Council, will be implemented through an amendment to the City of Lethbridge Land Use By-law No. 3574. It is proposed that this area be placed in a direct control district with subdivision and development subject to the guidelines set out in this Area Redevelopment Plan.

The Area Redevelopment Plan provides an expression of development objectives and a framework for review of subsequent subdivision and development proposals. Since actual development will be dictated largely by prevailing market conditions on both a micro and a macro scale, it may occur over a considerable period of time. The Area Redevelopment Plan must therefore retain a fair degree of flexibility in order to accommodate the changing conditions likely to take place during the time required to achieve full development. This will be achieved by utilizing a direct control method of assessing and guiding development on the parcels in the CentreSite lands, and at the same time setting out a methodology and series of guidelines for evaluating such development proposals. The guidelines identified below are intended to assist in ensuring that development occurs in accordance with relevant City policy and requirements.

### 6.2 DEVELOPMENT AGREEMENT AND DEVELOPMENT PERMITS

Council shall regulate and control the use and development of land in the CentreSite lands through a development agreement between the applicant and the City. Council may require that the development agreement be executed prior to the issuance of any development permit.

- 6.2.1 Council may, through the development agreement required for developments in the CentreSite lands, specify any regulation, criterion or condition necessary to ensure that the development conforms with the proposal(s) approved by Council, including the stipulation that a development permit is applied for and received within a specified period of time.
- 6.2.2 Council may direct that a development permit be issued provided that the application conforms to the provisions of the development agreement.
- 6.2.3 If the development proposal involves subdivision, a proposed plan of subdivision shall be included in the development agreement as the basis for future subdivision. The Municipal Planning Commission shall not approve any subdivision under this District which does not generally conform with the provisions of the development agreement.

### 6.3 GUIDELINES FOR DEVELOPMENT

- 6.3.1 No development applications excepting those for Sites 1, 5A and 5B will be made unless supported by detailed geotechnical documentation. The specific issues include the abandoned coal mines, the slope stability and presence of fill material. In any event, no development is to take place beyond the "safe development" limit unless supported by a geotechnical report.
- 6.3.2 It is the intention of City Council and CentreSite that the existing C.P.R. station shall be retained as an historic site and incorporated into the comprehensive development proposed for Site 4.

- 6.3.3 Careful design consideration shall be given to the interface with adjacent areas so as to ensure as high a degree of compatibility as possible.
- 6.3.4 A 15.24 (fifteen point two, four) m building setback shall be required from any Canadian Western Natural Gas high pressure line.
- 6.3.5 Noise attenuation from the C.P.R. mainline and the Crowsnest Corridor shall be provided to the satisfaction of the City of Lethbridge.
- 6.3.6 Visual buffering of the C.P.R. mainline and the Crowsnest Corridor, where necessary, shall be provided to the satisfaction of the City of Lethbridge.
- 6.3.7 The building design, orientation and construction must take cognizance of wind effects, sun angles, sound attenuation, the open space network, view and interface with other uses.
- 6.3.8 Any major shopping facility must relate to and complement the developments and uses south of 1st Avenue South. Prior to approving the development of any major retail facility, City Council shall be satisfied that such a facility will not have the effect of weakening the vitality of the existing commercial area south of 1st Avenue South.
- 6.3.9 Any commercial development in Site 3, other than the proposed hotel and ancillary uses, shall be principally for use by those resident or occupant within Site 3 and must be compatible with other uses in the area.
- 6.3.10 The mixed use/commercial development in Site 4 should facilitate a pedestrian linkage to Galt Gardens.



- 6.3.11 While possible environmental reserve is indicated in the CentreSite A.R.P. the actual provision will be determined at the subdivision stage.
- 6.3.12 Internal public pedestrian linkages should be provided and constructed to standards acceptable to the City.
- 6.3.13 The open space network should complement and reinforce the function and importance of Galt Gardens.

#### 6.4 USES AND EVALUATION OF USES

Council may allow any use or development which complies with the CentreSite Area Redevelopment Plan's Development Goals and Objectives as set out in Section 5.1, the Proposed Land Uses set out in Section 5.3, and any use which in its opinion, is compatible with the character of existing surrounding uses and Permitted Uses in surrounding land use districts. In determining the acceptability of a use or development, Council may consider, in addition to the relationship to this Statutory Plan, the following other matters:

- 1) the consideration given by the applicant to the guidelines set out in 6.3 above
- 2) the relationship and compliance with the General Municipal Plan, and other Statutory Plans and City policies applicable to this area as well as those plans and policies for surrounding areas that may have an impact on this area
- 3) its compatibility with surrounding existing land uses
- 4) its traffic impact
- 5) the location, function and design of roadways, parking facilities, pedestrian circulation and transit systems servicing the parcel for which the comprehensive site plan has been prepared

- 6) its impact on services such as water and sewage systems, public transit and other utilities
- 7) its impact on community services including school facilities and the open space system
- 8) its environmental impact including attention to noise, visual and microclimatic matters
- 9) its consideration to energy conservation and efficiency
- 10) the provision and quality of landscaped open space and recreation amenities
- 11) its responsiveness to the documented concerns and opinions of area land owners and residents

#### 6.5 INFORMATION REQUIREMENTS

In submitting a development proposal for Sites 1, 2, 3, 4, 5A and 5B, the applicant shall provide the following information:

- 6.5.1 A comprehensive site plan covering the site or sites which the applicant is proposing to develop. Such a plan shall consist of
- A) a written statement outlining
    - i) the proposed development including the relationship to the CentreSite Area Redevelopment Plan
    - ii) the compatibility with surrounding land uses
    - iii) traffic and public transit impacts in terms of daily and peak hour generation and assignments
    - iv) impacts on and service requirements for water, sewage and other utilities
    - v) relationship to any right-of-way or easement requirements

- vi) in the case of Site 4, the manner of integration with or effect on the historic C.P.R. Station and Galt Gardens
  - vii) an assessment of impacts on community services including student generation and school capacities and the open space system
  - viii) the staging schedule, and duration of construction for the proposal
- B) a site plan showing the proposed plan of development including
- i) existing and final topography of the site
  - ii) the proposed floor area ratio, density, height and number of units or floor area for each of the uses
  - iii) automobile, transit and service vehicle movement and circulation patterns, access and egress points to and from the site and all existing rights-of-way and easements within the development area
  - iv) parking/loading, and transit stops
  - v) inside or outside recreational amenities and open spaces
  - vi) principal linkages to surrounding uses with respect to pedestrian movement, private transportation, transit, delivery and collection services
  - vii) method of water supply, sewage disposal, electric power, telephone, natural gas, cable and other utility services
  - viii) location and size of all proposed signs
  - ix) landscaping details for all open spaces, including

location and design of street furniture and other amenities

x) elevations and sections and a description of finishing materials illustrating the proposed treatment of all building facades, roofs and other design details which are to be representative of all buildings and structures comprising the development

xi) for development involving subdivision, a proposed plan of subdivision

6.5.2 Drawings drafted to a scale of 1:200 unless the project is of such size that this would not be practical. In this event, the scale may be reduced to 1:500 with detailed plans highlighting more complex aspects of the proposal at 1:200.

6.5.3 City Council may consider a development proposal and render a decision even though some of the information required in Sub-section 6.5.1 has not been provided, if Council is of the opinion that such a decision can properly be made without it.

## 6.6 PROPOSAL ASSESSMENT PROCEDURE

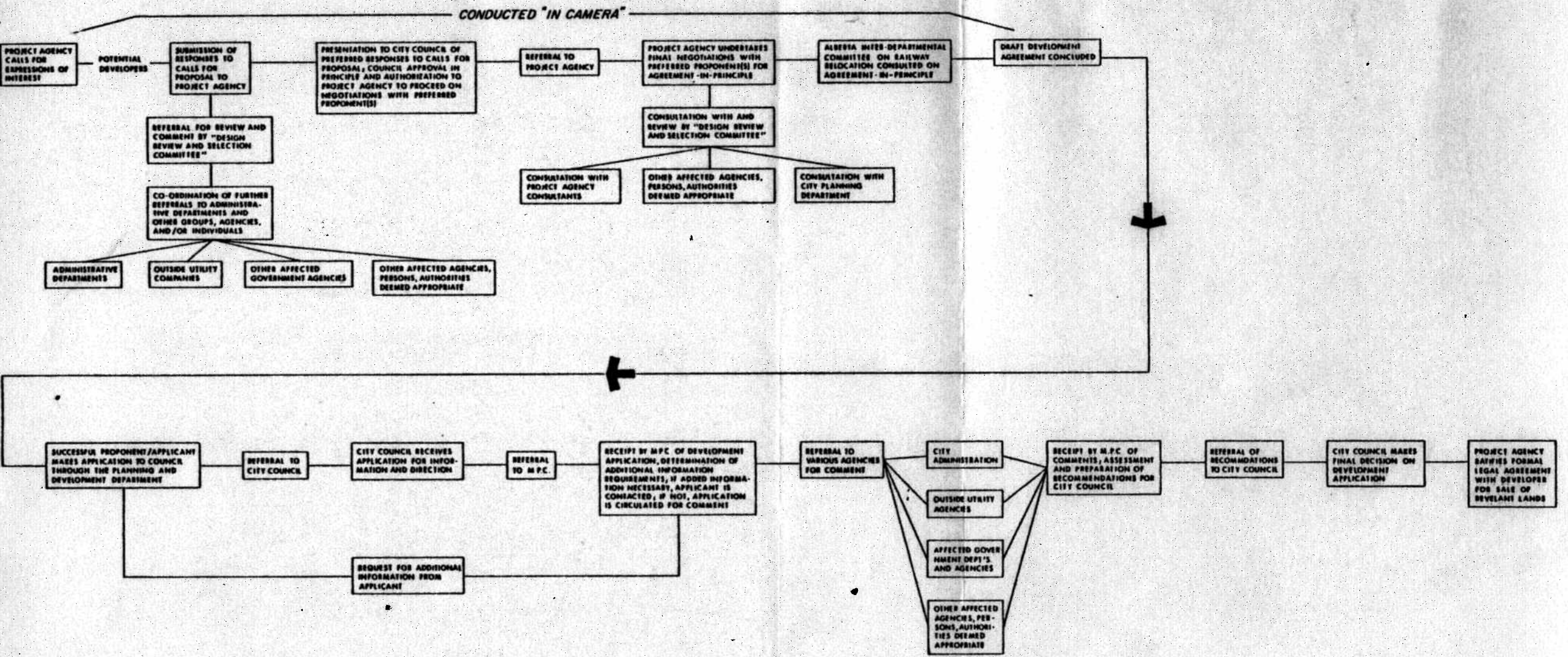
Subject to the conditions listed therein, all proposals for development in Sites 1, 2, 3, 4, 5A and 5B shall be accompanied by the information as set out in Section 6.5, Information Requirements.

6.6.1 INITIAL SALE OF CENTRESITE LANDS (Figure 1)

6.6.1.1 All initial expressions of interest for development of the CentreSite lands shall be submitted to the CentreSite Lethbridge Board of Directors (also known as the "Project Agency"). In evaluating the responses to the calls for proposal, the Project Agency may request the submission of such additional information,

75a

FIGURE 1: PROCEDURE FOR INITIAL SALE OF CENTRESITE LANDS



including technical tests, impact studies or any other data it deems necessary to conduct a proper review of said responses to the calls for proposal.

- 6.6.1.2 All responses to the calls for proposal shall be referred by the Project Agency to the "Design Review and Selection Committee" for review and comment. The Committee shall be responsible for:
- a) co-ordinating the referral of the responses to the calls for proposal to those agencies, departments, authorities and persons it deems necessary in order to execute a proper evaluation;
  - b) assessing and evaluating the responses to the calls for proposal and preparing recommendations to the Project Agency in respect to the responses to the calls for proposal.
- 6.6.1.3 The "Design Review and Selection Committee" shall be appointed by City Council and shall consist of 7 members, of whom 3 members plus the chairman shall be selected by CentreSite Lethbridge, with the remaining 3 to be members of the Municipal Planning Commission, including the Chairman of the Municipal Planning Commission, the Director of Planning and at least one other member of M.P.C.
- 6.6.1.4 Upon receipt of the recommendations of the "Design Review and Selection Committee", the Project Agency shall review and determine which of the responses to the calls for proposal it prefers or if there are several, the order of preference, and forthwith shall submit its recommendations to City Council.
- 6.6.1.5 Council shall, upon receipt of the recommendations of the Project Agency, review the various responses to the calls for proposal

and may approve in principle, the choice of the preferred proponent and authorize the Project Agency to proceed to negotiate with said proponent.

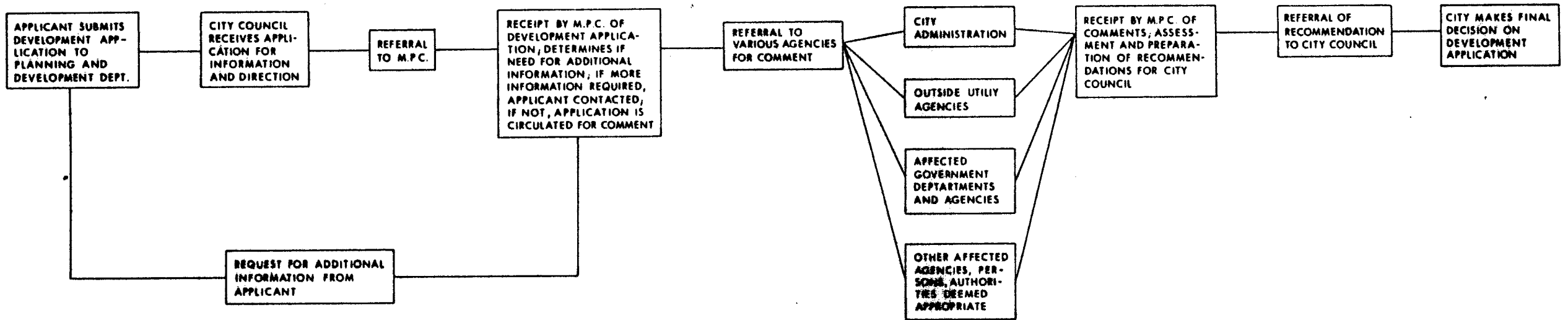
- 6.6.1.6 Upon authorization by Council to undertake negotiations with the preferred proponent(s), the Project Agency shall commence such negotiations to sell the property/properties in question. In conducting such negotiations, the Project Agency shall consult the Design Review and Selection Committee, which in turn shall co-ordinate consultation with the City of Lethbridge Planning Department and other agencies, persons and authorities it deems appropriate.
- 6.6.1.7 Upon concluding an agreement-in-principle in the negotiations referred to in 6.6.1.6, the Alberta Government's Interdepartmental Committee on Railway Relocation shall be consulted to ensure conformity with all aspects relating to provincial government involvement.
- 6.6.1.8 Steps 6.6.1.1 through 6.6.1.7 inclusive will be carried out "in camera".
- 6.6.1.9 Subject to such conditions or requirements as may be set out in the agreement-in-principle described in Section 6.6.1.7 the proponent/applicant of the reponse to the calls for proposal shall make application to Council through the Planning and Development Department for development of the lands which are the subject of his application. Unless he has already done so during the undertaking of Sections 6.6.1.1 through 6.6.1.7, the applicant shall submit the information requirements set out in Section 6.5. In



addition, if required the applicant shall make the necessary applications for subdivision.

- 6.6.2.0 The Planning Department shall submit the application to City Council for information and direction. City Council may then authorize the application to be referred to the Municipal Planning Commission for evaluation and preparation of recommendations.
- 6.6.2.1 Upon completion of any circulation process deemed necessary, and upon evaluating the application and preparing recommendations, the Municipal Planning Commission shall submit its recommendations to City Council.
- 6.6.2.2 City Council shall, upon receipt of the recommendations of the Municipal Planning Commission, and upon considering the requirements set out in Section 6.4, make a decision in respect to the application. In making its decision and setting out any conditions of approval, City Council shall take into account the requirements set out in Section 6.2. The decision of City Council is final.
- 6.6.2.3 Following the Council decision as set out in 6.6.2.2, the Project Agency shall proceed to conclude the formal agreement with the developer for the sale of the relevant CentreSite site(s).
- 6.6.3 DEVELOPMENT APPLICATIONS SUBSEQUENT TO CENTRESITE LAND SALES (FIGURE 2)
- 6.6.3.1 Developers proposing to make application to develop lands subsequent to initial sale or proposing to make modifications to their developments following purchase of CentreSite properties

FIGURE 2 : APPLICATION FOR DEVELOPMENTS SUBSEQUENT TO CENTRESITE LAND SALES



shall be subject only to those steps set out in Sections 6.6.1.9 to 6.6.2.2 above.

APPENDIX A

Preliminary Geotechnical Investigation  
Lethbridge Redevelopment Project  
EBA Engineering Consultants Ltd.

# EBA Engineering Consultants Ltd.

1981 05 12



**EARTH-SCIENCES  
ENGINEERING**

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Damas and Smith Limited  
Suite 820, 1520 - 4th Street, S.W.  
Calgary, Alberta  
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302-0771

ATTENTION: R.M. Zazelenchuk

Dear Mr. Zazelenchuk:

RE: LETHBRIDGE RE-DEVELOPMENT PROJECT  
PRELIMINARY GEOTECHNICAL INVESTIGATION

## I. INTRODUCTION

As a part of our preliminary investigation for the Lethbridge Re-Development Project, a site reconnaissance was conducted on April 14, 1981. The objectives of the field visit were to ground-proof the local geology, possible subsidence occurrences and possible slope stability problems within the study area.

This report summarizes the method of study and the findings of the reconnaissance visit and subsequent office analysis. A final, more detailed, engineering report is currently being prepared.

## II. WORK PERFORMED

Office engineering completed prior to the reconnaissance visit included a detailed airphoto review and literature search. The purpose of this work was to evaluate existing geological landforms and surficial soil conditions in and around the study area.

The field reconnaissance was carried out on foot and by vehicle. Accessible excavations and exposures in the area were examined in order to provide more information on the local geology. Within the study area the natural slope angles were measured and the surficial soils were examined. As well, factors influencing possible slope movement such as drainage patterns, tension cracks or vegetation were examined.

A stability analysis of slopes adjacent to the proposed development area was completed based upon findings of the field reconnaissance and literature/airphoto review. No additional subsurface investigations or laboratory testing was undertaken for this analysis. The final engineering report will present details of the slope stability analysis. In the meantime, however, results of this preliminary analysis have been used to establish the "safe development guidelines presented in Section IV of this letter report.

### III. SITE DESCRIPTION

The study area consists of a wide, relatively flat plateau at prairie level, bordered by a coulee to the north, Highway No. 3 to the west, 1st Avenue North to the south and 13th Street North to the east. The site currently serves as a storage and maintenance yard for the Canadian Pacific Railway in Lethbridge. Soil conditions on the site consist of clay (till) with interbedded sand units. This material is overlain by an undetermined thickness of debris (slag) material originating from steam locomotive times. Some depressions found on the west side of the site were determined to be from the foundations of an old roundhouse. The vegetation on the site consists of natural grasses and some shrubs. Along the north slope adjacent to the coulee, the vegetation pattern indicated that some seepage was occurring along the slope. West of Highway No. 3, the slope drops off approximately 70 metres to the flood plain of the Oldman River. This slope is markedly dissected by a series of incised coulees.

The Lethbridge area is underlain by a system of buried valleys. These valleys were infilled with material deposited by successive glaciers, lakes, aggrading rivers and wind. The various deposits are exposed on numerous bluffs along the modern-day Oldman River. Drawing No. A-6, shows the stratigraphic sequence exposed along the Oldman River valley. The carbonaceous siltstone of the Oldman Formation contains several coal bearing seams as well as one or more bentonite beds. Above the Oldman Formation, separated by a buried gravel channel are various till layers composed of clay, silt and sand with occasional gravel lenses. Several other drawings showing the general stratigraphy in the study area are also included (Drawing Nos. A-1 to A-7).

### IV. PRELIMINARY DEVELOPMENT GUIDELINES

Geotechnical investigations completed to date have not revealed any factors which would limit the types of development considered for the site area. A "safe development" line has been established based on these preliminary geotechnical investigations. For preliminary planning purposes this line has been arbitrarily set 10 metres back from the "top of slope" line shown on the site plan, Figure 1. Factors of safety against slope failures within the "safe development" zone all exceed 1.5. Further investigations, including testhole drilling and laboratory testing, will allow the refinement of this "safe development" limit, especially in areas of slag dumping and fill areas north of the existing roundhouse building. The "approximate top of 'fill' slope" and zone of "slag (debris) material" is also shown on Figure 1. Certain types of development beyond the "top of the slope" line may also prove feasible following more detailed geotechnical studies. In this regard, setback requirements of various government agencies should be considered prior to development planning and initiation of any further geotechnical investigations.

Also shown on the site plan is the area underlain by abandoned coal mine workings. Prior to finalizing development plans for this area, deep testhole drilling will be required to determine the exact location of the old mine workings and the potential for further subsidence within this area. In this regard, a detailed plan of the abandoned mine workings has been compiled and will be presented as part of the final engineering report on this project.

V. RECOMMENDATIONS FOR FUTURE WORK

As mentioned above, more information is required to aid in making refined development recommendations pertaining to setback distances, slope stability, subsidence occurrence and foundation design. Future work should entail a subsurface investigation to determine the following:

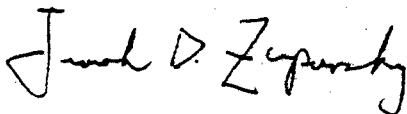
1. Stratigraphy and soil property parameters within the development area.
2. Thickness of the debris (slag) material overlying the natural overburden;
3. Groundwater levels throughout the study area;
4. Potential effects of the mine workings which underlie approximately 10-15 percent of the study area, mainly in the western half.

VI. CLOSURE

We trust that this report meets your present requirements. Should you have any questions, however, please do not hesitate to call.

Yours very truly,

EBA ENGINEERING CONSULTANTS LTD.



F.D. Zupansky, E.I.T.  
FDZ/PG/tcs



P. Glen, P.Eng.

PRELIMINARY GEOTECHNICAL INVESTIGATION  
LETHBRIDGE RE-DEVELOPMENT PROJECT

Submitted to:

DAMAS AND SMITH LIMITED

SEPTEMBER, 1981

302-0771



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## SUMMARY

A preliminary site investigation was carried out in an area near the Canadian Pacific Railway yard in Lethbridge. The investigation consisted of a literature review, airphoto examination and a ground reconnaissance. The objective of this program included the identification of geotechnically related factors that may affect site development and to provide guidelines for planning and conceptual designs.

Three potential problem areas were identified as a result of this initial work. These are summarized as follows:

- o The site is located adjacent to the Old Man River Valley. The results of a stability analysis carried out using assumed soil stratigraphy, strength parameters and piezometric surface indicated that the safety against failure is generally less than 1.5 and less than unity for a water table located within 4.0 m of the ground surface. While no old failure scars were observed on the slope adjacent to the site, old and recent slope failures were noted along other sections of the river valley. Further work will be necessary to assess the slope in terms of the proposed site rehabilitation.
- o The western portion of the site is underlain by old coal workings. Abandoned adits and shafts are known to exist but their exact locations are not known. Presently, shallow depressions were observed on the site and are suspected to be the result of ground subsidence arising from these old mine openings. Consideration will have to be given to these openings in site rehabilitation.
- o Areas within the site have been used as railway waste and fill dumps. The nature and extent of these dumps will have to be determined so that any foundations that are required could be designed to take into account potential differential settlement.

1981 October 1

## I. INTRODUCTION

Plans are being made to re-develop the Canadian Pacific Railroad Yard area in Lethbridge, Alberta. Preliminary planning for this project is being provided by Damas and Smith Ltd. of Calgary, who commissioned EBA Engineering Consultants Ltd. to perform a preliminary geotechnical investigation of the site.

The findings of this investigation, which consisted of an airphoto study, a geology literature review, a reconnaissance site visit and an old coal workings location search are presented in this report. Preliminary development guidelines and recommendations for future investigation phases are also addressed.

Figure 1 is a general location plan for the project. The re-development site is located near the downtown area of Lethbridge on the east bank of the Oldman River Valley as shown on Figure 2 and also on Drawing No. B-1 in Appendix B. The CPR rail line from the yard leads on to the famous high trestle bridge over the Oldman Valley at the southwest corner of the re-development property. Highway No. 3 passes along the southern boundary of the site, under the CPR trestle bridge.

## II. WORK PERFORMED

### 2.1 Literature Review

Published information was searched and studied to obtain information on the locations of abandoned coal mines and on the geology of the area. Information on the coal mines was obtained from the Energy Resources Conservation Board (ERCB). The site plans (scale 1:12,000), dated during the 1940's, are currently used by the ERCB and are considered to be relatively accurate although not possessing the precision of recent survey drawings. For field usage and geological interpretation, the

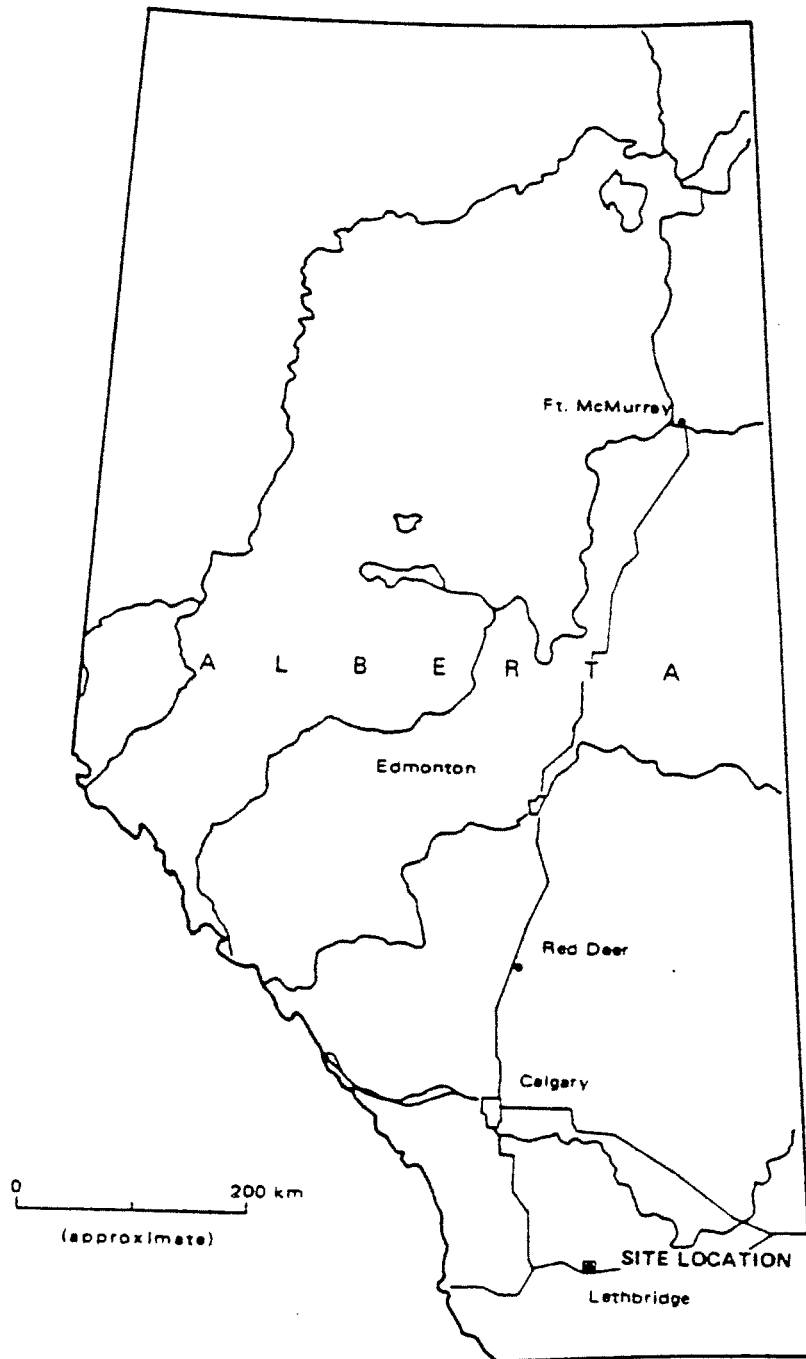


FIG. 1 LOCATION PLAN

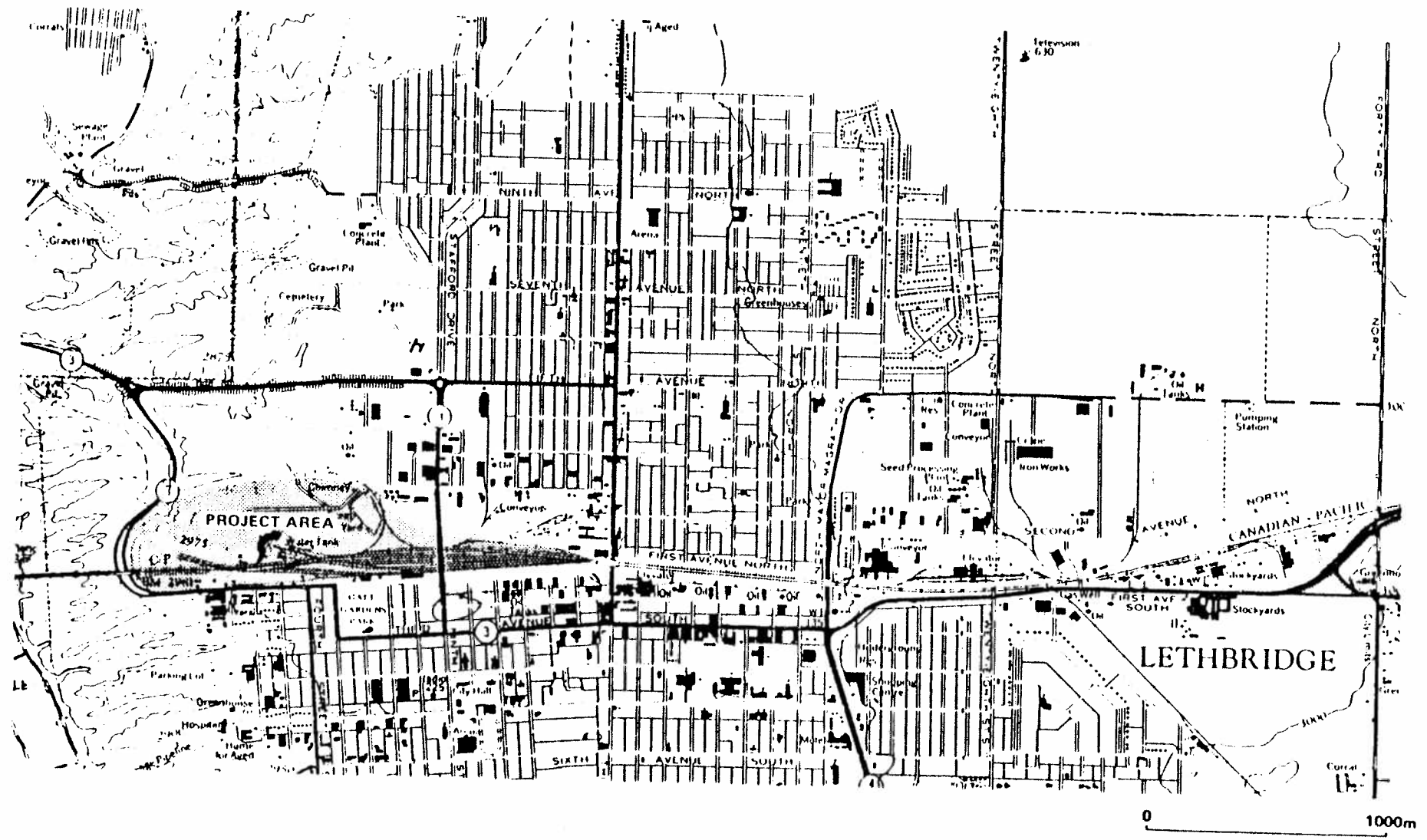


Fig. 2 SITE PLAN  
LETHBRIDGE RE-DEVELOPMENT PROJECT

1981 October 1

mine plans were enlarged to a scale of 1:2000. The expansion process may have caused some distortion, but in spite of this, the plan is still considered to have sufficient accuracy for use in the present study and for preliminary development planning. A more accurate delineation of abandoned mine locations will be required prior to final development of the site.

## 2.2 Airphoto Interpretation

Airphotos were obtained and interpreted to evaluate the existing geological landforms and surficial soil conditions in and around the site. From these photographs, areas of past and present slope instability and erosional gullying as well as other topographic features were identified for later ground checking.

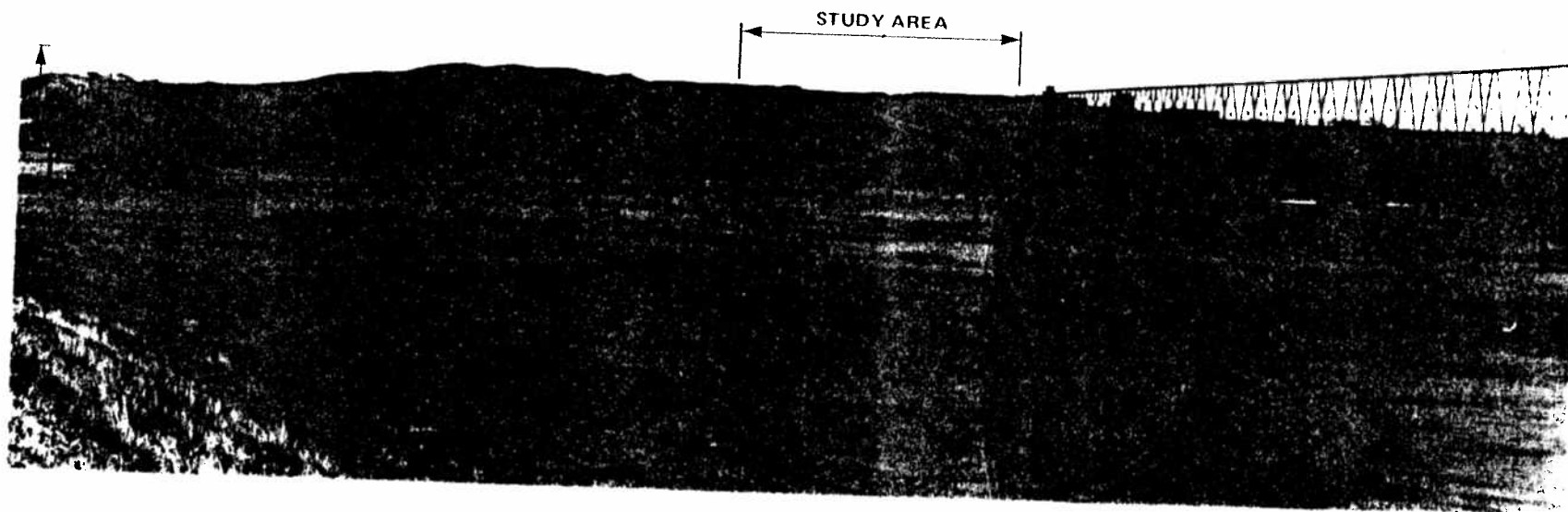
## 2.3 Field Reconnaissance

A field reconnaissance was carried out on foot and by vehicle. Accessible excavations and exposures of the local stratigraphy were examined to obtain information on the local geology. The natural slope angles were measured and the surficial soils examined to provide an initial indication of possible stability problems. As well, factors influencing possible slope movement such as drainage patterns, tension cracks or vegetation were examined.

No subsurface investigations or collection of soil samples for laboratory testing were carried out for this investigation.

## III. SITE DESCRIPTION

The re-development site is located on a relatively wide, flat plateau area bordered by a coulee to the north and by the crest of the Oldman River Valley to the west. Plate No. 1 is a general view of the study area. The valley slopes drop off approximately 70 metres to the valley bottom flood plain. These slopes are markedly dissected by a series of



**PLATE NO. 1 :** View showing the Flood Plain and extensively eroded Eastern slopes of the Oldman River, below the study area.

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incised coulees as shown in Plate No. 1 in a view across the valley towards the study area. A closer view of these coulees is presented in Plate No. 2. Plate Nos. 3 and 4 show further examples of slope development adjacent to the study area.

Round to oval shaped depressions, with very gentle side slopes and up to 1.5 m deep were found on the site. These are shown in Plate No. 5. Some of these depressions are possibly due to mine subsidence while others are thought to be formerly related to foundations of old buildings on the site including an abandoned roundhouse.

Various fill and debris exists on the site. Slag from the steam locomotive days is also found on portions of the site. Plate No. 6 illustrates the debris at the west end of the rail yards while Plate No. 7 shows dumped debris and rubble piles located adjacent to the present rail yards. These fill areas are also shown in Drawing No. B-1.

Vegetation on the site consists primarily of natural grasses and a few shrubs.

#### IV. GEOLOGY AND STRATIGRAPHY

The Oldman River Valley has been incised into glacial drift and Cretaceous age sedimentary bedrocks. The drift overlying the bedrock consists of pre-glacial gravels, glacial till and glaciofluvial and glaciolacustrine sediments. The valley bottom is incised into the carbonaceous siltstone of the Oldman Formation. Typically the stratigraphy is as illustrated in Drawing Nos. A-2, A-3, A-4, A-6 and A-7. The locations of these sections are shown in Drawings A-1 and A-5. Drawings A-2 to A-4 show the subsurface sediments to a depth of about 20 m while Drawings A-6 and A-7 show the stratigraphy to a depth in excess of 100 m. Beneath the study area, a significant gravel layer immediately overlies the bedrock while underlying the glacial sediments.





**PLATE No. 2** View of gulley erosion along the Oldman River adjacent to the study area. Also shown are some soil creep scars and a shallow slide.



PLATE No. 3 View north of valley slope on the east side of the Oldman River showing typical slope profile.

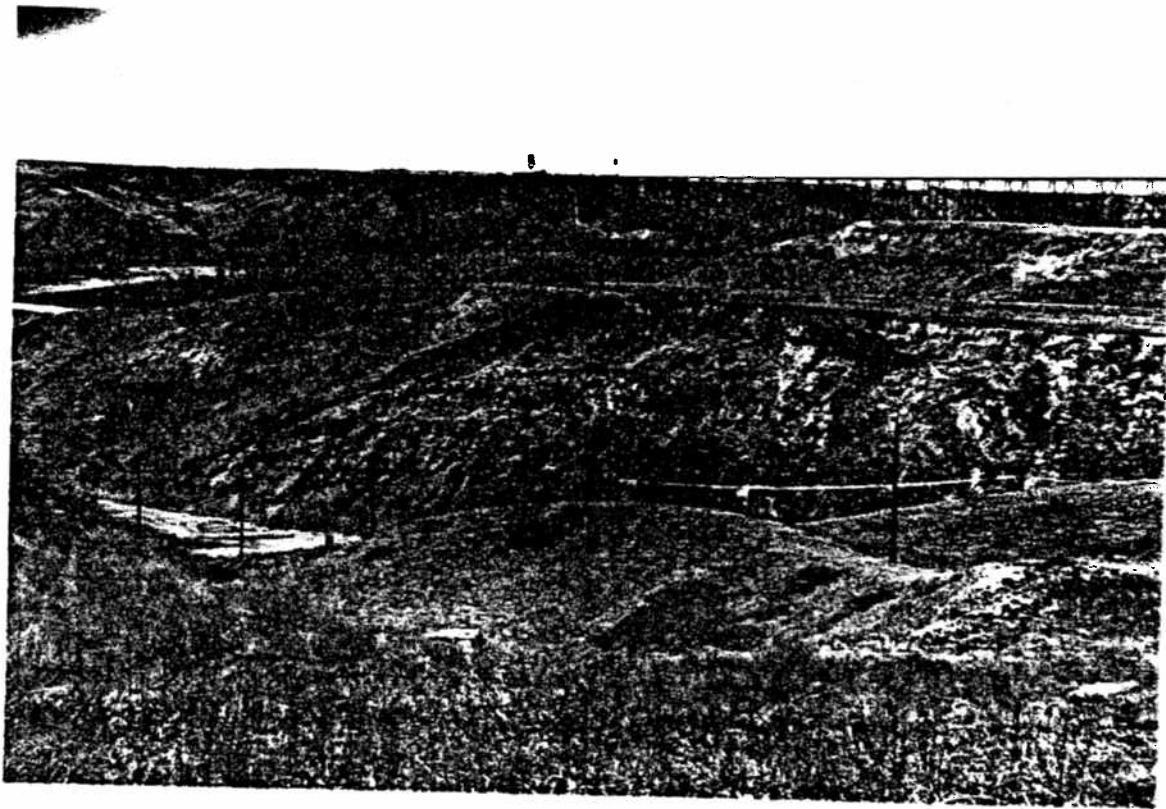


PLATE No. 4 View of recently failed slope and old failed slope scar (background) in the Lethbridge area.



PLATE No. 5 View of a possible subsidence depression located on the western portion of the study area.

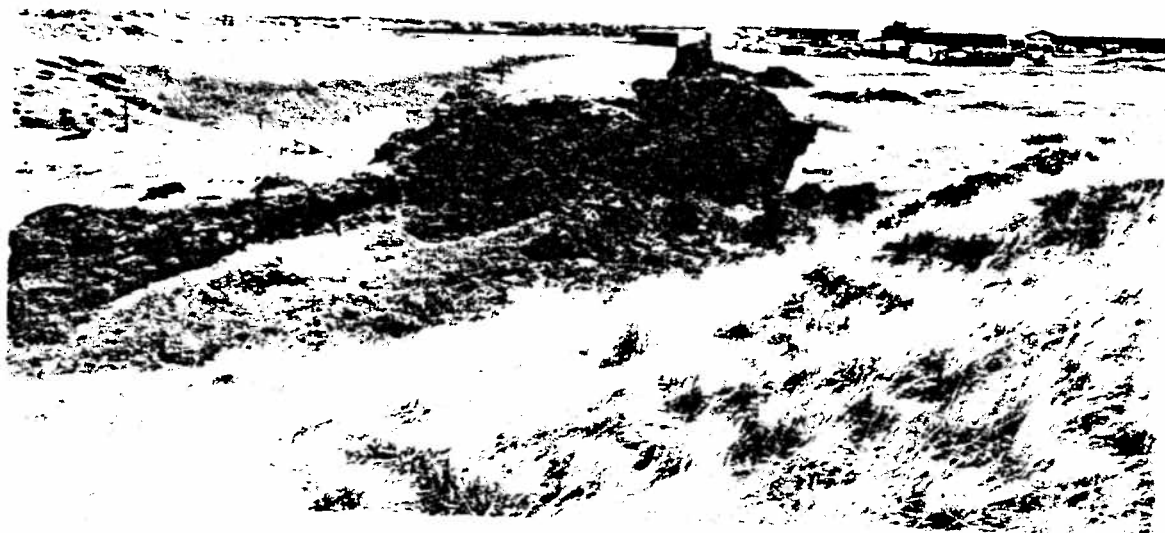


PLATE No. 6 View of study area showing dumped debris material at western end of rail yards.



PLATE No. 7: View of miscellaneous fill and debris material on the study area adjacent to the present rail yards.

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The bedrock of the Oldman Formation contains coal bearing seams and beds of bentonite as illustrated in Plates 8 and 9. These bentonite layers are often the cause of large, deep seated landslides. This phenomenon is discussed further in the next section.

Water seepage was observed in some of the coulees along the west and northwest side of the site. This seepage is suspected to occur on a regular basis as evidenced by the vegetative patterns and drainage features. Plate 10 shows the features typical of groundwater seepage. Groundwater conditions are not known with any certainty away from the slopes.

#### V. SLOPE STABILITY

Landslides are a common occurrence along the banks of the Oldman River Valley. Some are very old and deep while others are fairly shallow and have taken place recently. The failures shown in Plate 4 are typical. Surficial slumping and creep are also evident on the slope as shown in Plate 2. Typical slope profiles that exist in the area are shown in Plate 3.

Large, deep seated slope failures usually occur along stratigraphically weak zones such as the bentonite layers noted earlier. This is especially the case when there is a high water table in the slope and the bentonite layer becomes saturated. It does not appear that there is any potential for this type of deep seated failure since no bentonite layers were observed in the slopes adjacent to the re-development property. This will have to be confirmed by subsurface drilling.

The glacial till is generally a fairly competent material and are not prone to failure unless there is a high water table in the slope. The recently failed slope shown in Plate 4 appears to be in till and is suspected to be a result of a high water table as substantial seepage was observed in the bottom of the coulee near the toe of the coulee.



PLATE No. 8: Section showing stratigraphic units exposed along the Oldman River adjacent to the study area:  
A. Gravel  
B. Bentonite layer  
C. Siltstone (Oldman formation)



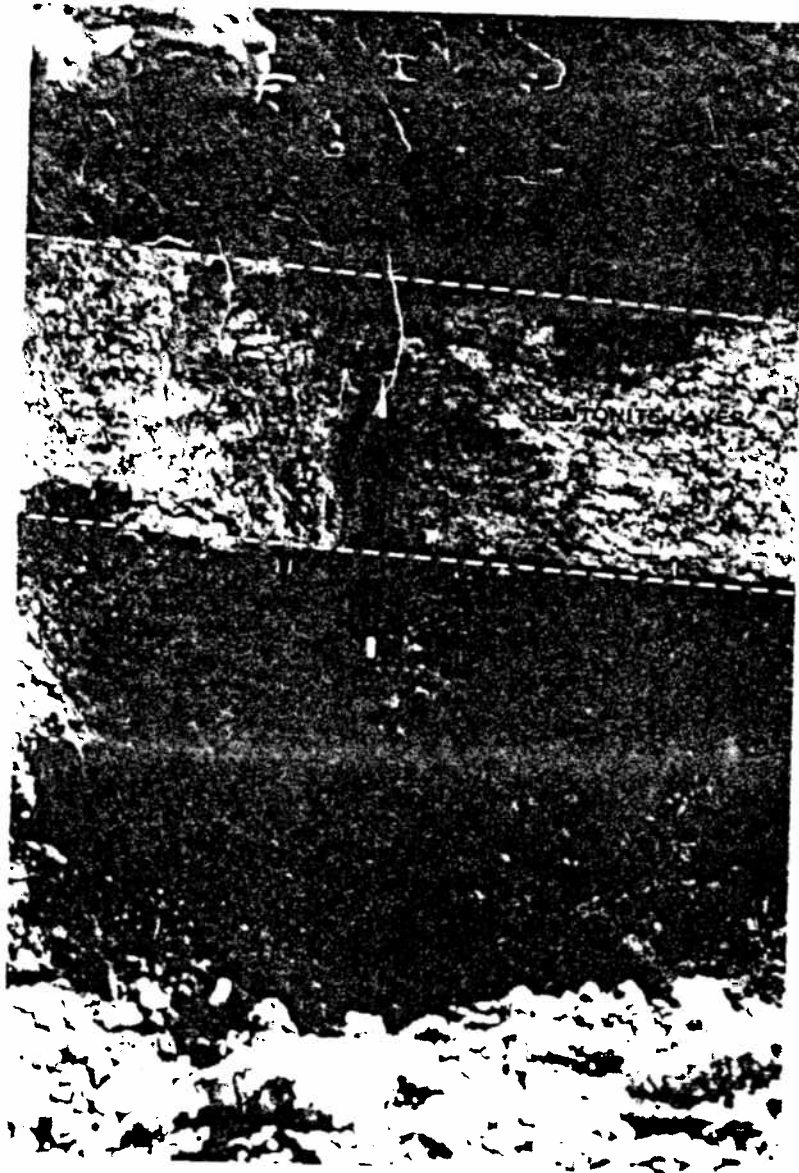


PLATE No. 9: Section showing the bentonite layer within the Oldman formation.

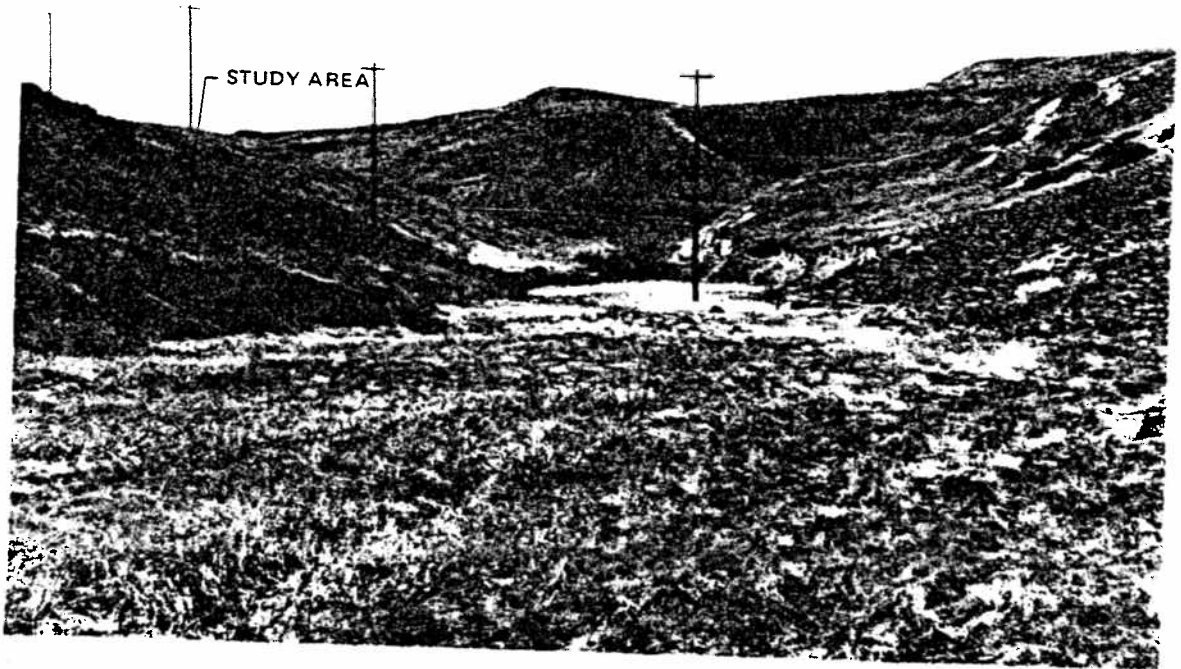


PLATE No. 10: View west down the gulley adjacent to the north slope of the study area showing slope erosion and drainage features.



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Factors of Safety were computed for the upper slopes near the re-development site using assumed soil properties and two different water table conditions. A computer program was used to analyze the stratigraphic section B-B' (Drawing A-3) and stability charts were used to determine the Factors of Safety for the two stratigraphic sections shown in Drawing A-2 and A-4. For the stability analysis of section B-B', the soils were divided into clay and sand as in Figure 3 with properties assumed as follows:

| MATERIAL | (sat)                | (wet)                | C' | $\phi'$ |
|----------|----------------------|----------------------|----|---------|
|          | (kN/m <sup>3</sup> ) | (kN/m <sup>3</sup> ) |    |         |
| Clay     | 21.7                 | 19.80                | 15 | 22°     |
| Sand     | 20.1                 | 20.1                 | 0  | 33°     |

Factors of Safety which were computed for six assumed failure surfaces under high and low water table conditions are also shown in Figure 3. The results of the preliminary stability analysis indicate that the safety factors are greater than unity for the assumed low water table, but can be below unity, indicating theoretical failure, if the water table reaches within 4 m of the ground surface as shown in Figure 3. In general slopes occurring within or immediately adjacent to a development must have a Factor of Safety of at least 1.5.

#### VI. OLD COAL WORKING

The western portion of the re-development site is underlain by old coal workings. On the basis of information available from the Energy Resources Conservation Board, the adits are located as shown in Drawing B-2. Establishing the exact locations, if necessary, will have to be carried out by testhole drilling.

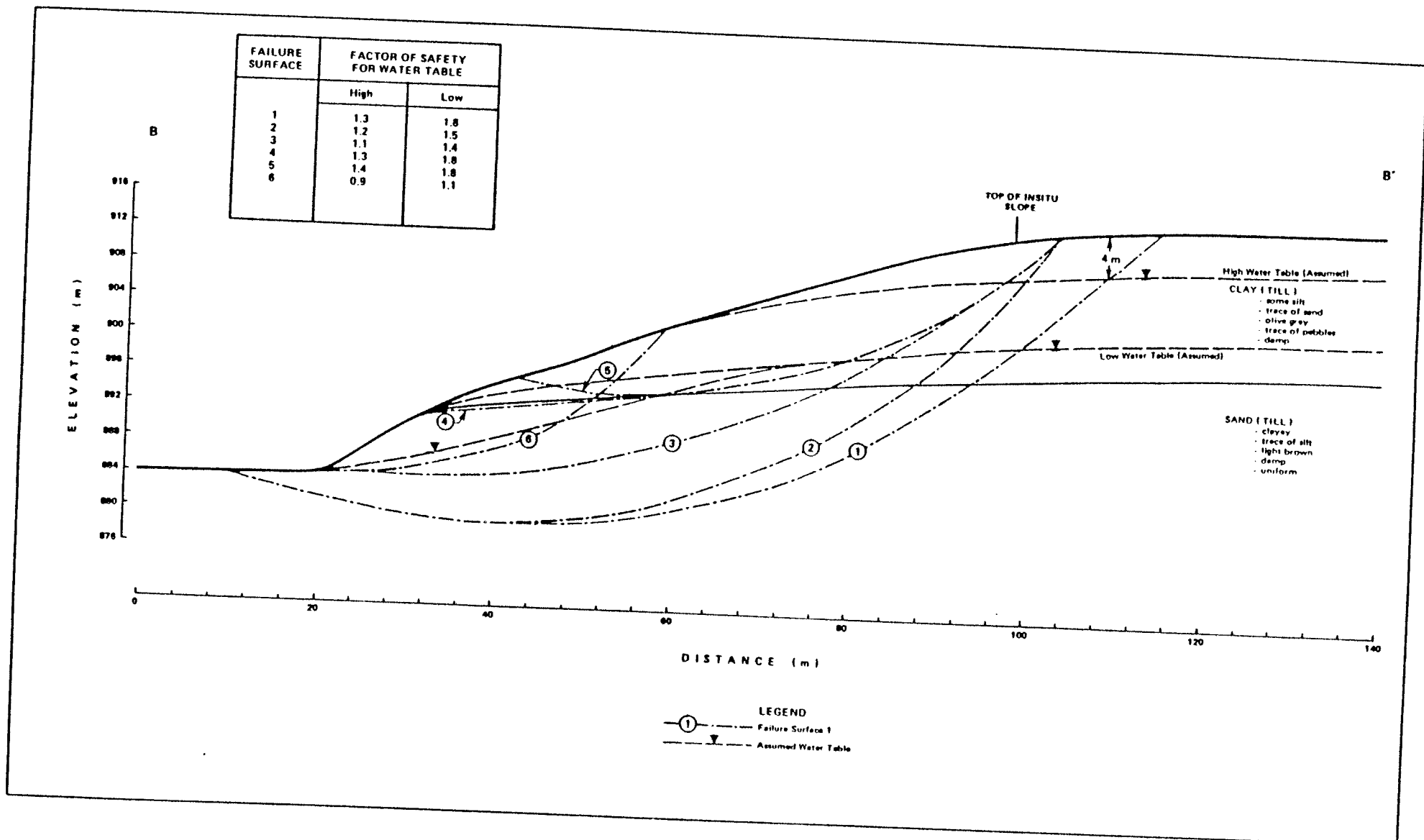


FIGURE 3 SLOPE STABILITY ANALYSIS\* STRATIGRAPHIC SECTION B - B'

\*Stratigraphic units have been assumed from field observation

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## VII. PRELIMINARY DEVELOPMENT GUIDELINES

On the basis of this preliminary geotechnical evaluation, the most serious geotechnical problems that will have to be addressed are the potential instability of the slopes bordering the property and differential settlement arising from the coal workings and the fill areas. Other than these factors, the investigation has not revealed any factors which would limit the type of development considered for the site.

A development "set-back" line adjacent to the slopes has been selected on the basis of this study and is shown in Drawing B-1. This line is set back a uniform distance of 10 metres upslope from the "top of slope" for preliminary planning purposes only. Further investigations including testhole drilling and laboratory testing are required prior to finalizing this limit. Certain types of development may prove feasible for the area between the setback line and "top of slope" line depending on the results of a detailed geotechnical investigation.

Government agencies may have a setback requirement which applies to the site. The agencies to be considered are Alberta Transportation, Alberta Environment and the City of Lethbridge. These regulations should be considered, if they are applicable, during the initial stages of development planning.

It can be expected that extensive and careful foundation designs will be required in the area of the old coal mines. It will be necessary to locate the coal adits by closely spaced drilling. Once the locations of these adits are known, with a degree of confidence, foundations can be designed to accommodate their presence.

The fill in certain areas is also a factor in designing foundations. It may be necessary, in areas where structures are to be located, to remove the fill and replace it with inorganic compacted soil.

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VIII. CLOSURE

The information and recommendations presented herein are based on the geotechnical evaluation of data acquired from a literature search and a field reconnaissance. The subsurface conditions used for the analyses and evaluations were inferred from the mapping of surficial site soils exposed in the coulees and slopes within or adjacent to the site. A detailed investigation, including drilling to obtain site specific information, is necessary prior to proceeding with final design plans.

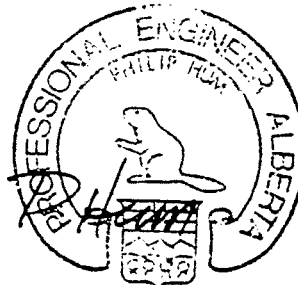
Respectfully submitted,

EBA ENGINEERING CONSULTANTS LTD.

Prepared by:

Reviewed by:

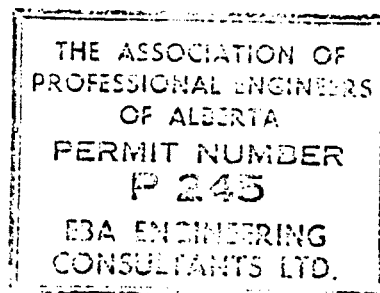
F. D. Zupansky, E.I.T.

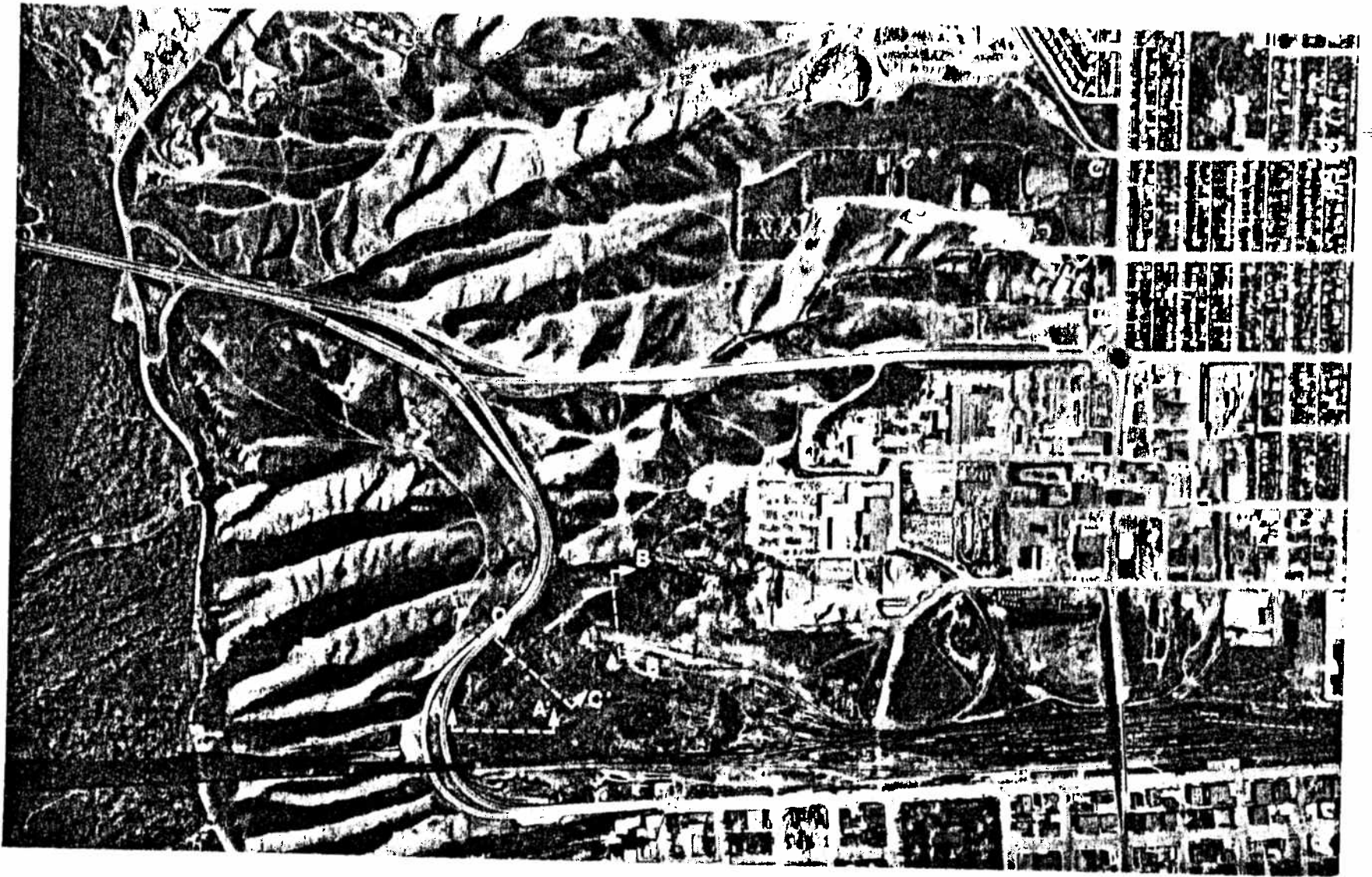


*for*

Paul Glen, P. Eng.

FDZ/PH/raw





**EBA Engineering Consultants Ltd.** 

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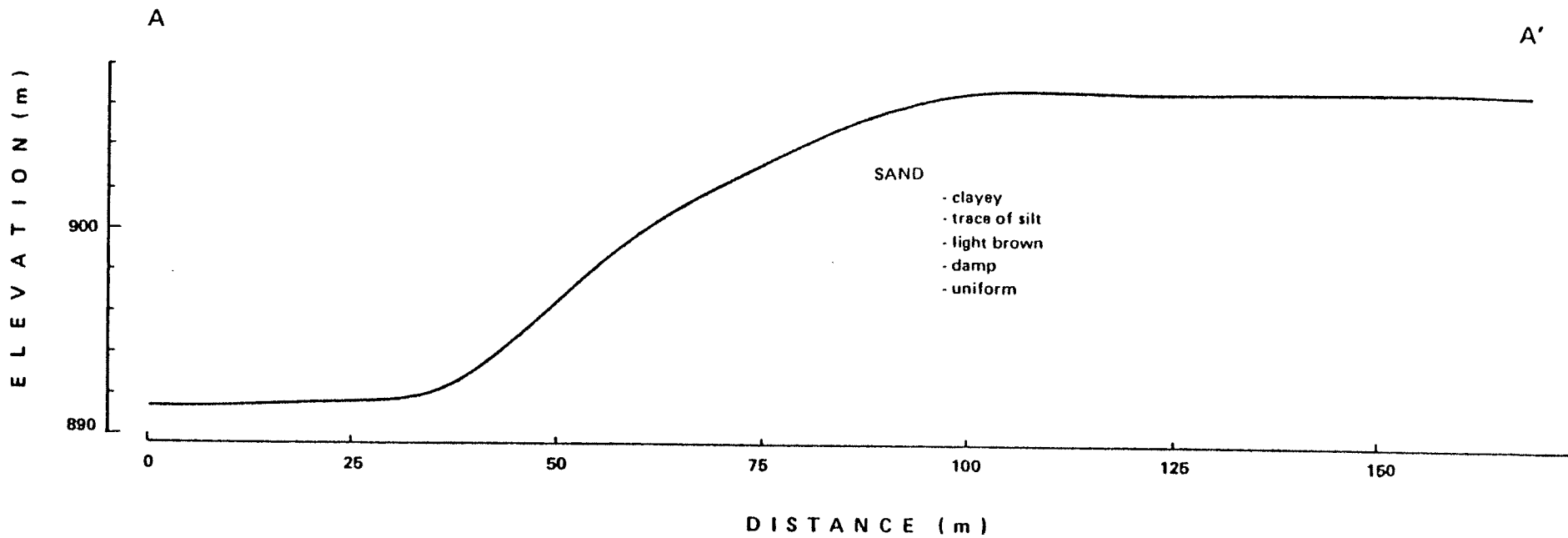
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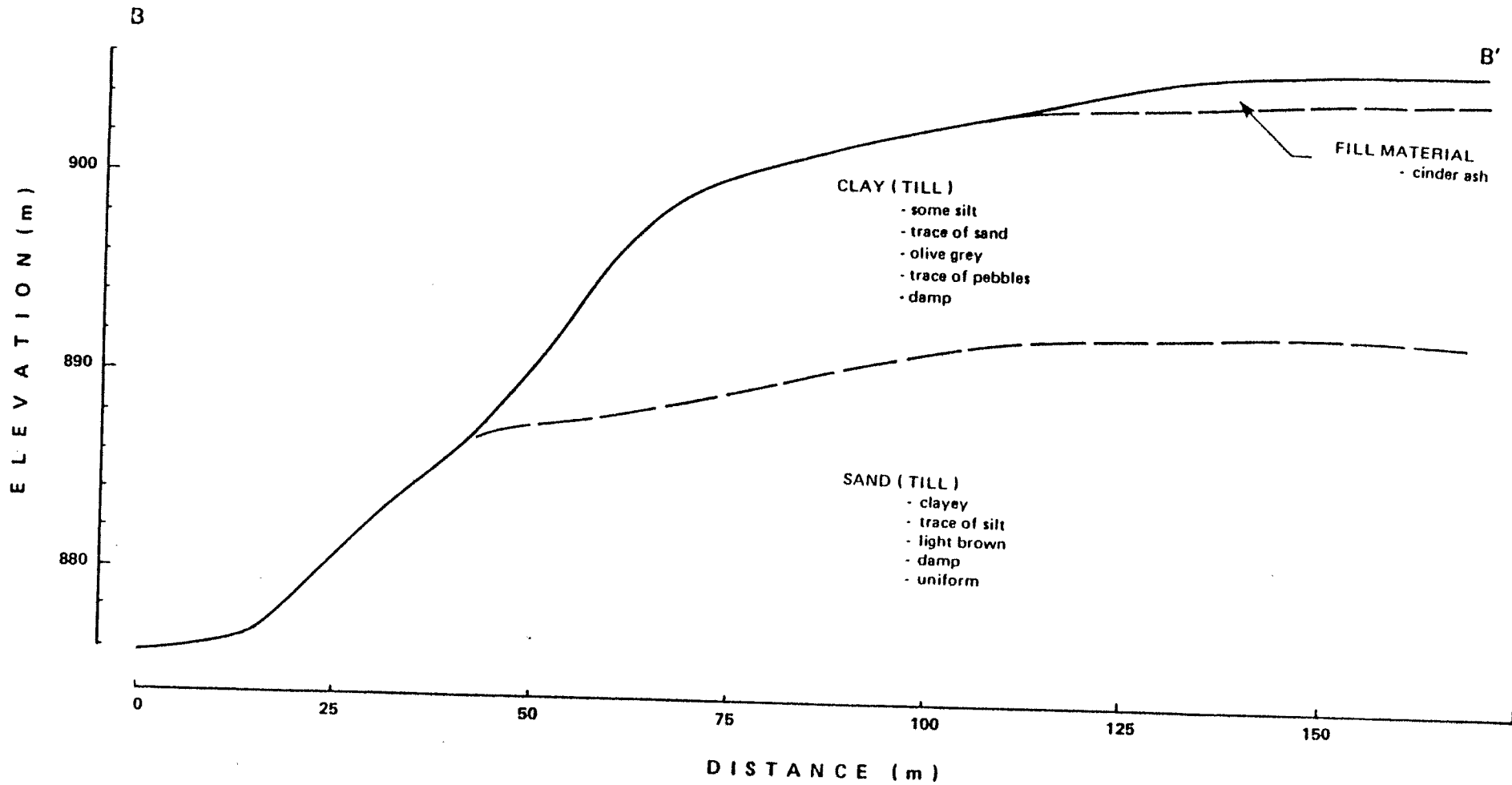
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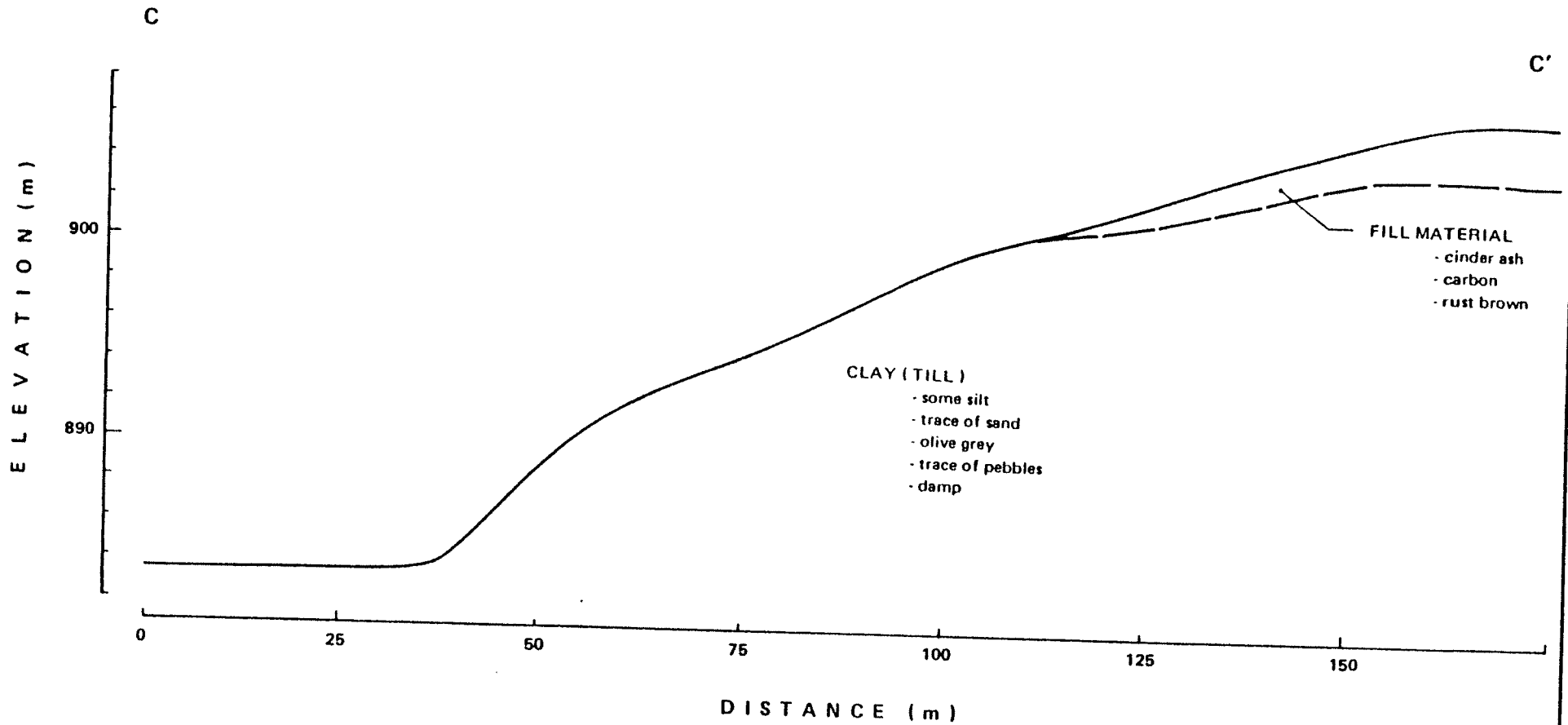
STRATIGRAPHIC SECTION A - A'

|                                                                                                                               |                |
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STRATIGRAPHIC SECTION B - B'

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STRATIGRAPHIC SECTION C - C'

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EBA Engineering Consultants Ltd. 

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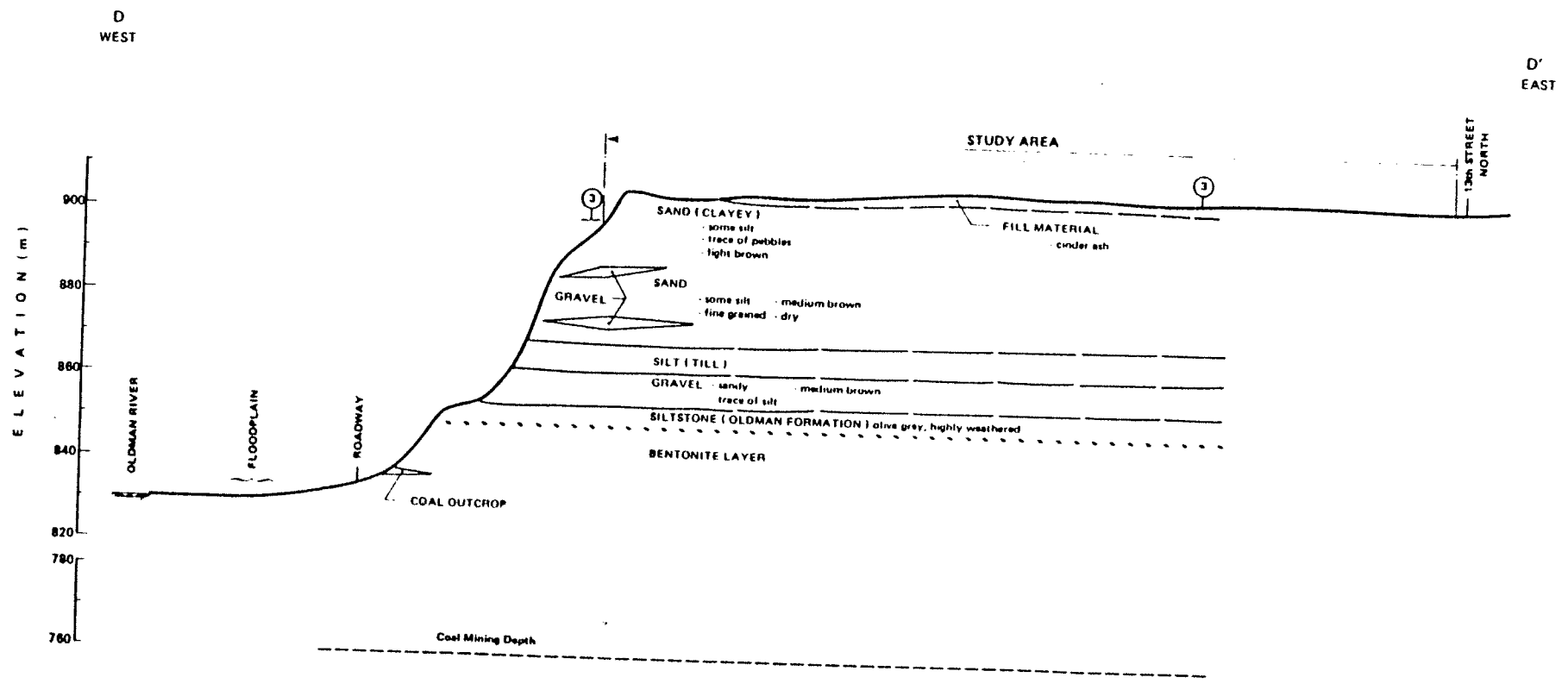
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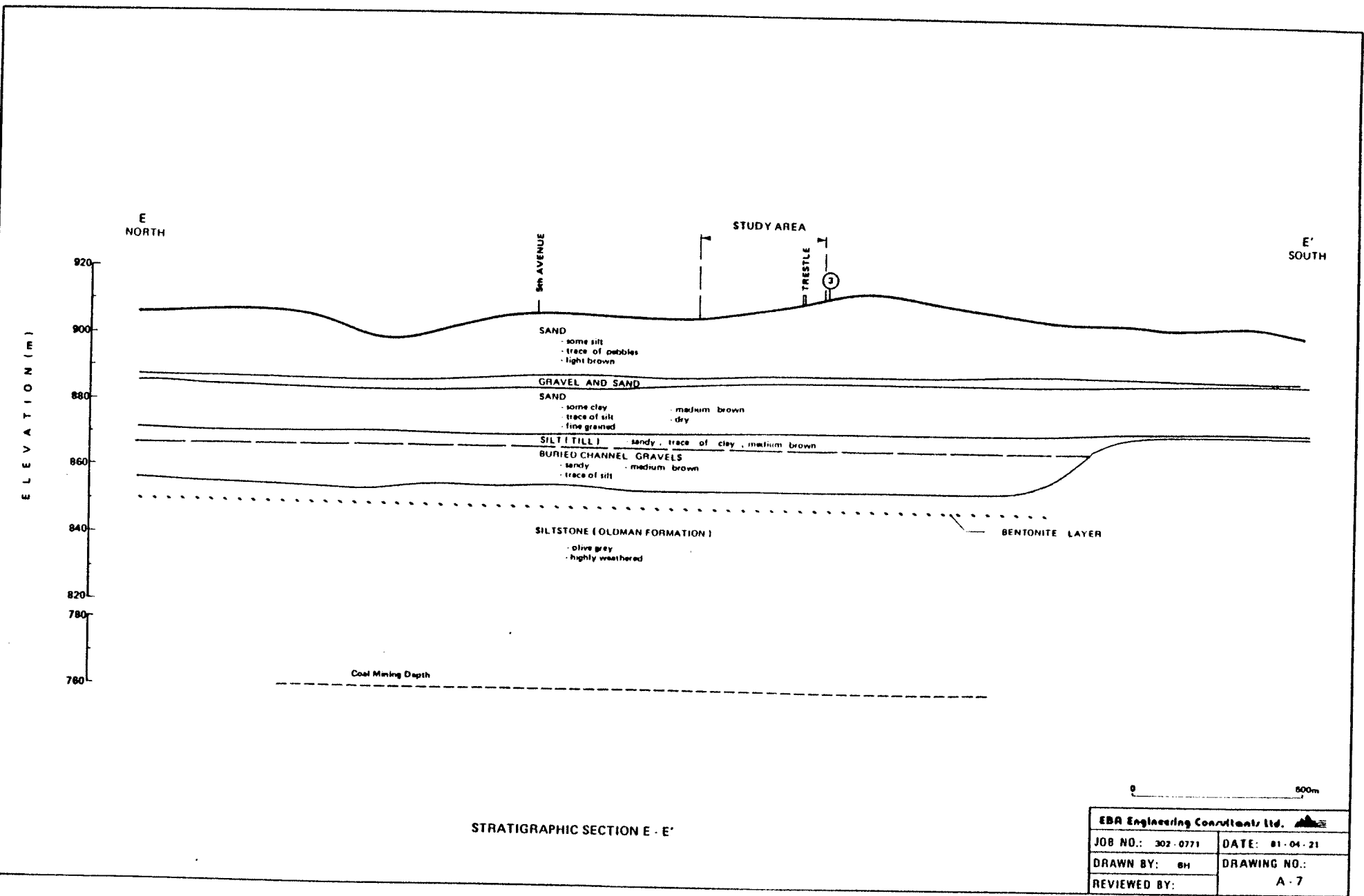
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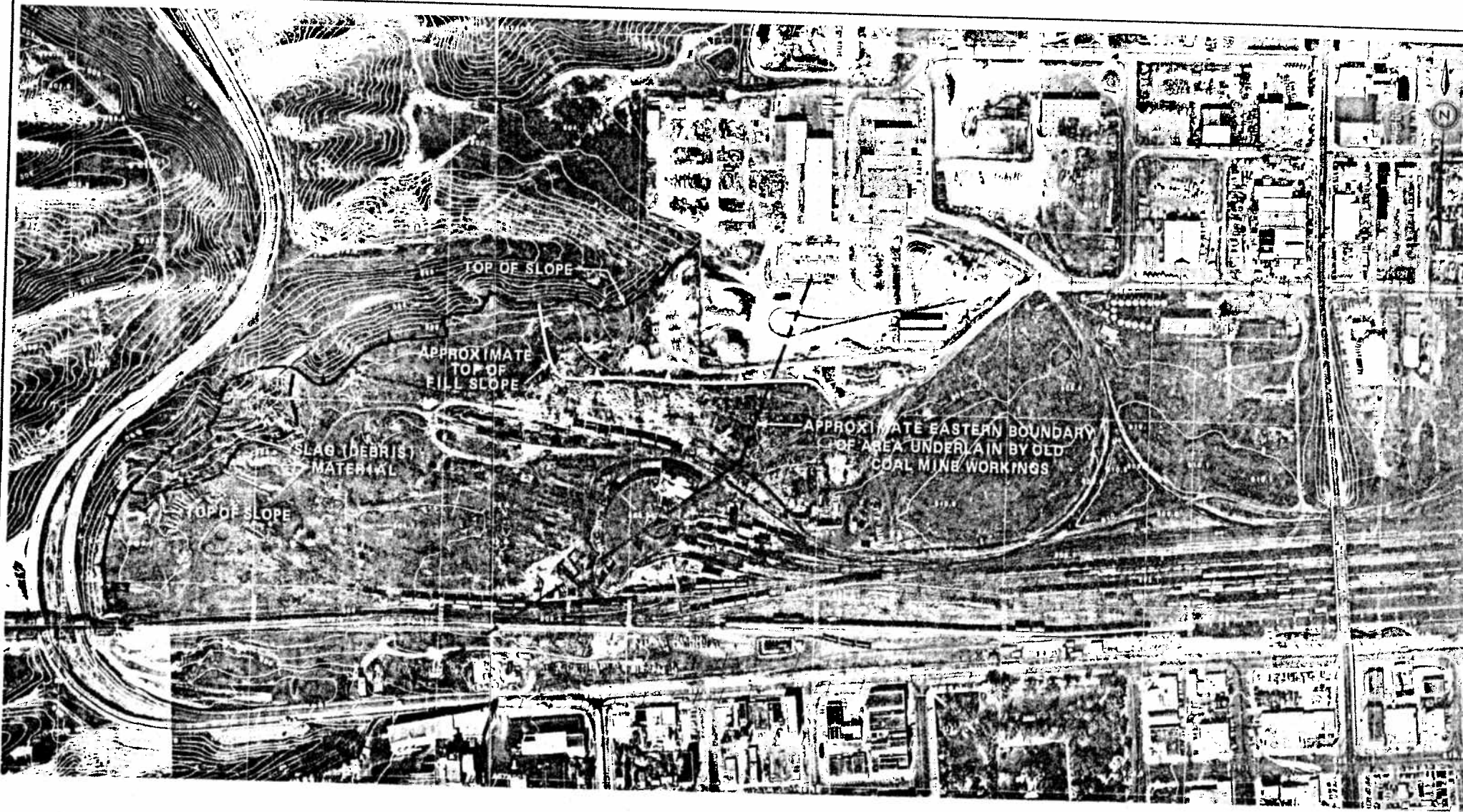


STRATIGRAPHIC SECTION D - D'



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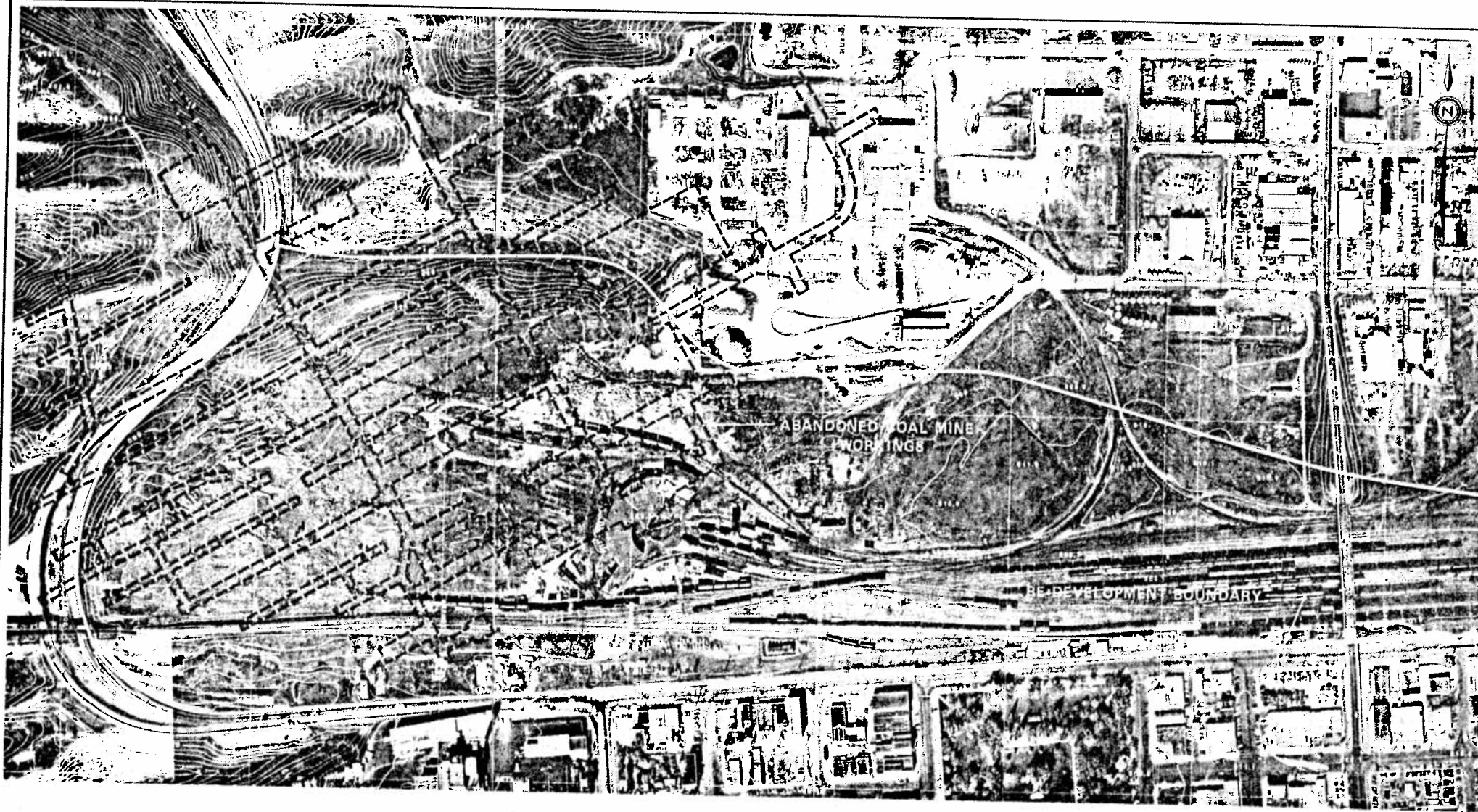


LETHBRIDGE RE - DEVELOPMENT PROJECT  
TOP OF SLOPE LOCATION

0 200m

|                                         |                |
|-----------------------------------------|----------------|
| <b>EBA Engineering Consultants Ltd.</b> |                |
| JOB NO.: 302 - 0771                     | DATE: 81/05/27 |
| DRAWN BY: BH                            | DRAWING NO.:   |
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LETHBRIDGE RE - DEVELOPMENT PROJECT  
ABANDONED COAL MINE WORKINGS

0 200m

|                                         |                    |
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| <b>EBR Engineering Consultants Ltd.</b> |                    |
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| DRAWN BY: BH                            | DRAWING NO.: B - 2 |
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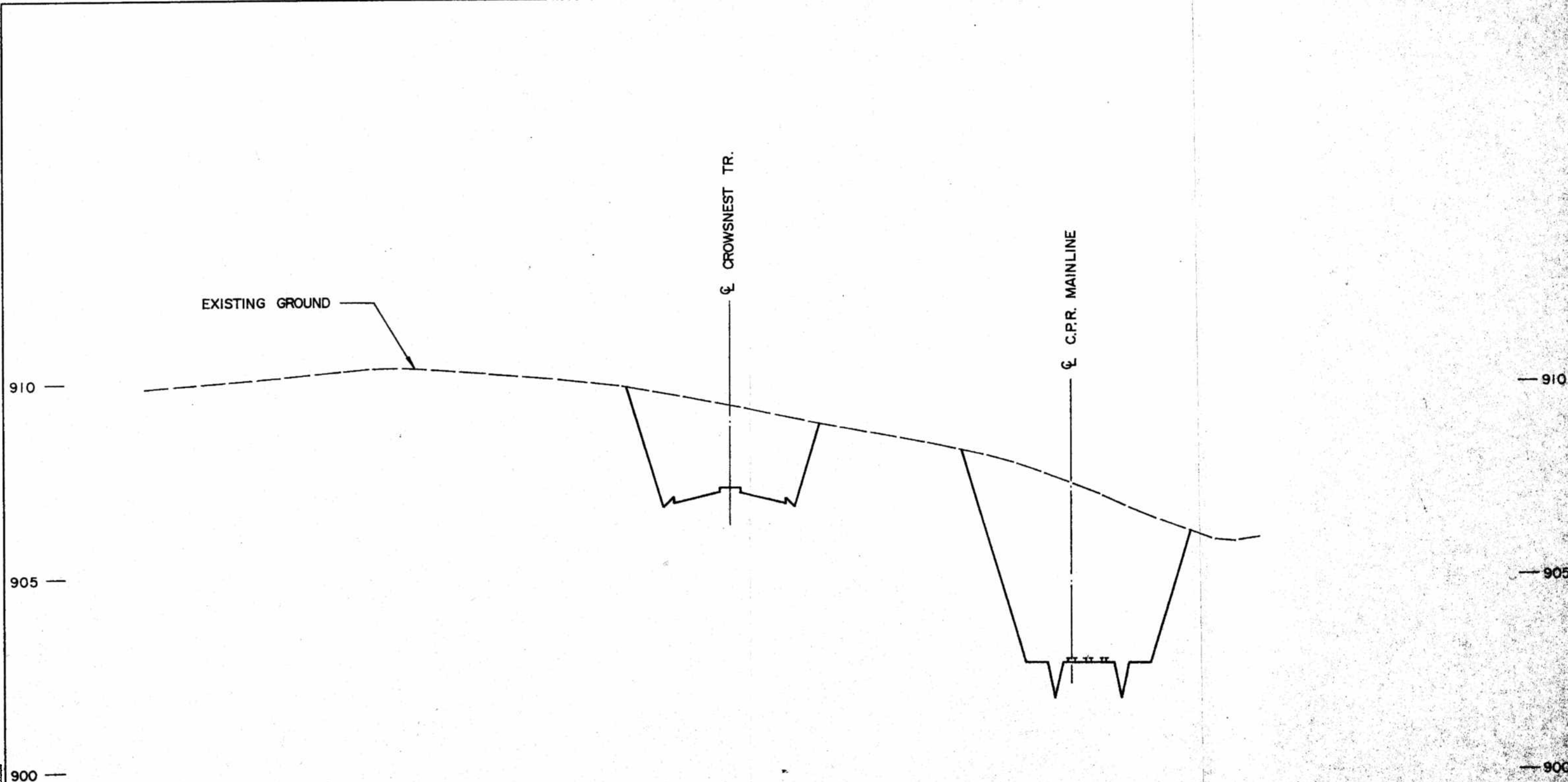
APPENDIX B

Cross Sections









EXISTING GROUND

☒ CROWSNEST TR.

☒ C.P.R. MAINLINE

910

910

905

905

900

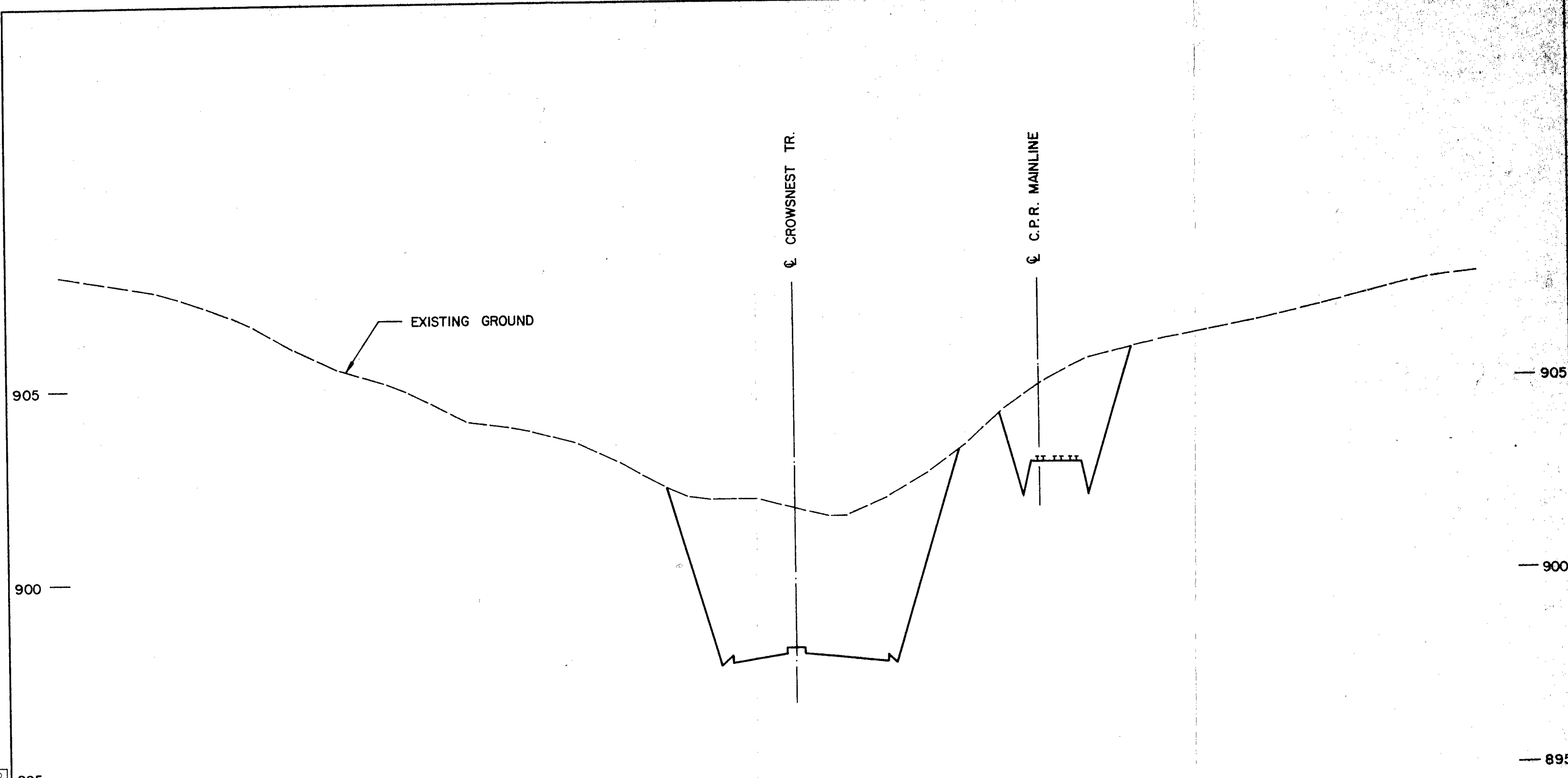
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**SECTION C-C**  
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 VERT. 1 : 100

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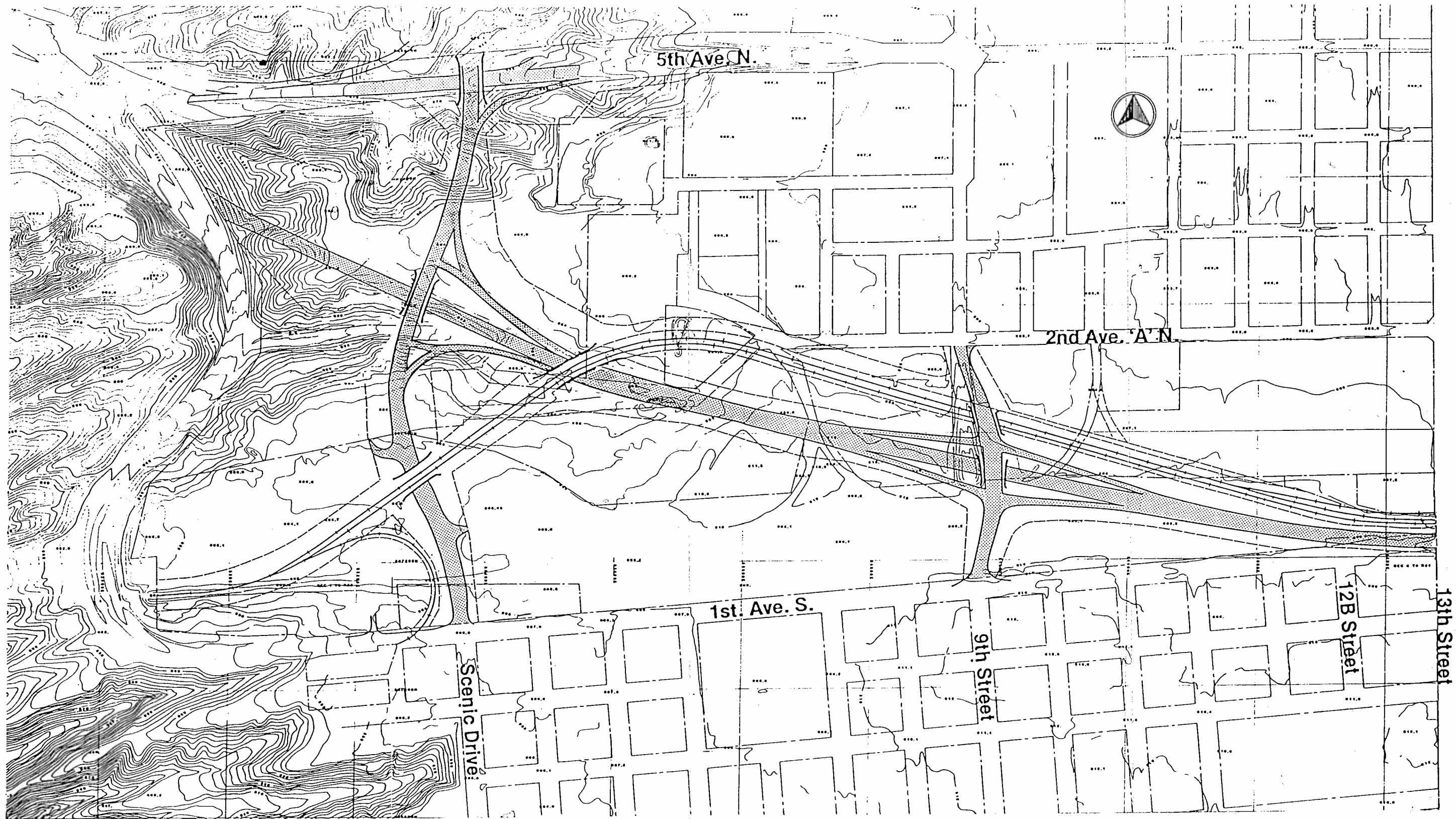
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APPENDIX C  
REVISED TRANSPORTATION NETWORK



\* Transportation Network revised to reflect one half diamond interchange proposed at north Scenic Drive and Crowsnest Trail subsequent to area redevelopment plan preparation.

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**RAILWAY RELOCATION LANDS**  
 REVISED TRANSPORTATION NETWORK  
 The City of Lethbridge, Alberta.

| REV. BY | DATE | DESCRIPTION | DRAWN | DATE     | SCALE  | DRAWING NO. |
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