MUNICIPAL DISTRICT OF YELLOWHEAD NO. 94
BYLAW NO. 27.95

BEING A BYLAW TO
ADOPT AN AREA STRUCTURE PLAN

WHEREAS, the Planning Act, Being Chapter P-9, R.S.A., 1980, and amendments thereto, authorize a Council, after holding a public hearing to proceed to pass a bylaw adopting an area structure plan;

AND WHEREAS, a public hearing was held in respect to the proposed area structure plan on the date written below;

NOW THEREFORE, the Council for the Municipal District of Yellowhead No. 94, in the Province of Alberta, duly assembled, hereby enacts as follows:

1) That the Sundance Recreations Area Structure Plan dated June, 1995 and attached hereto as Schedule "A" for land described as part of the Southeast Quarter, Section Seven (7), Township Fifty-Three (53), Range Nineteen (19), West of the Fifth (5th) Meridian is hereby adopted.

2) This bylaw comes into force at the beginning of the day that it is passed in accordance with Section 189 of the Municipal Government Act, R.S.A., 1994.

READ a first time this 11th **day of** July **, A.D., 1995.**

PUBLIC HEARING held this 25th **day of** July **, A.D., 1995.**

READ a second time this 25th **day of** July **, A.D., 1995.**

READ a third time this 25th **day of** July **, A.D., 1995.**

SIGNED this 25th **day of** July **, A.D., 1995.**

Reeve

Mary Northcott.
Municipal Secretary

SUNDANCE RECREATIONS

AREA STRUCTURE PLAN

JULY 1995

Prepared by:

Walker Consulting Group Ltd.
Tower III, Suite 200, 9618 - 42 Avenue
Edmonton, Alberta
T6E 5Y7
Tel: (403) 463-8137

The Sundance Recreations Area Structure Plan *(ASP)* is an overall development strategy for the lands within the SE¼ of Section 7-53-19-W5. The intent of the plan, as provided for in Section 64 of the Planning Act of Alberta, is to put forth a framework that describes the preferred and appropriate land uses for this area.

The policies of the Yellowhead Regional Plan, the Municipal District of Yellowhead No. 94 General Municipal Plan, and the Municipal District of Yellowhead No. 94 Land Use Bylaw guide the Sundance Recreations concept. These documents focus on different levels of detail to ensure that the development strategy considers both general and specific interests . . . for the immediate and longer time frames. Ultimately, the many dependent variables of the marketplace *(including surrounding developments and local government initiatives)* will influence the type, style, and pace of development within the Sundance Recreations ASP.

This report presents the Sundance Recreations Area Structure Plan. The Plan prepares the subject lands for development and provides an outline for future growth.

CONTENTS

INTRODUCTION

1. SUBJECT AREA

The area of the Sundance Recreations ASP lies within the SE¼ of Sec. 7-53-19-W5 and encompasses approximately 65 hectares *(160 acres)*. Highway 16 *(Yellowhead Highway)* is less than 300 metres to the south and excepting a few areas of improvement, there is an expanse of undeveloped land to the north. Marlboro - 23 kilometres west of Edson - is located a few hundred metres to the southwest with Black Mud Lake immediately west of Marlboro. To the east, across what is locally known as "Ranger Road," is a country residential district surrounding Millers Lake.

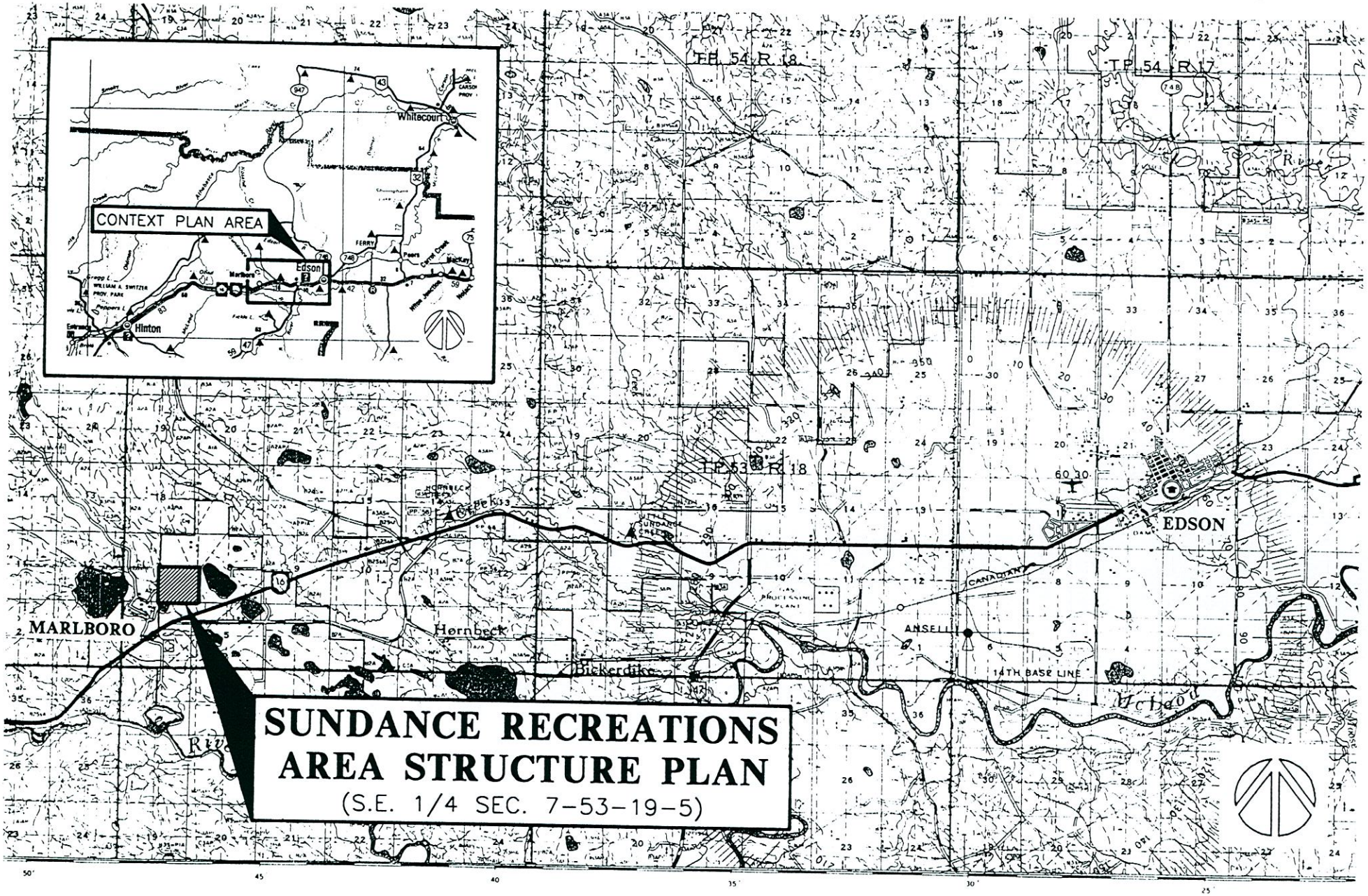
The context of the ASP to Edson and surrounding areas is shown in *Figure 1*.

2. PURPOSE OF THE AREA STRUCTURE PLAN

The intent of the Sundance Recreations ASP is to set out a framework for development. Its mandate is to describe the land uses, densities, transportation routes, public utilities, and sequencing of development. Other aspects are included to produce a more comprehensive document.

The principal aim of the ASP is to create a development concept for country residential homes. With two connections out to Ranger Road, a circular crescent will collect traffic from within the development. The layout is designed to locate homes within the higher concentrations of coniferous trees while maintaining the creek and low-lying wet area in the southwest part of the plan.

Figure 2 is an aerial photograph showing the immediate ASP area.

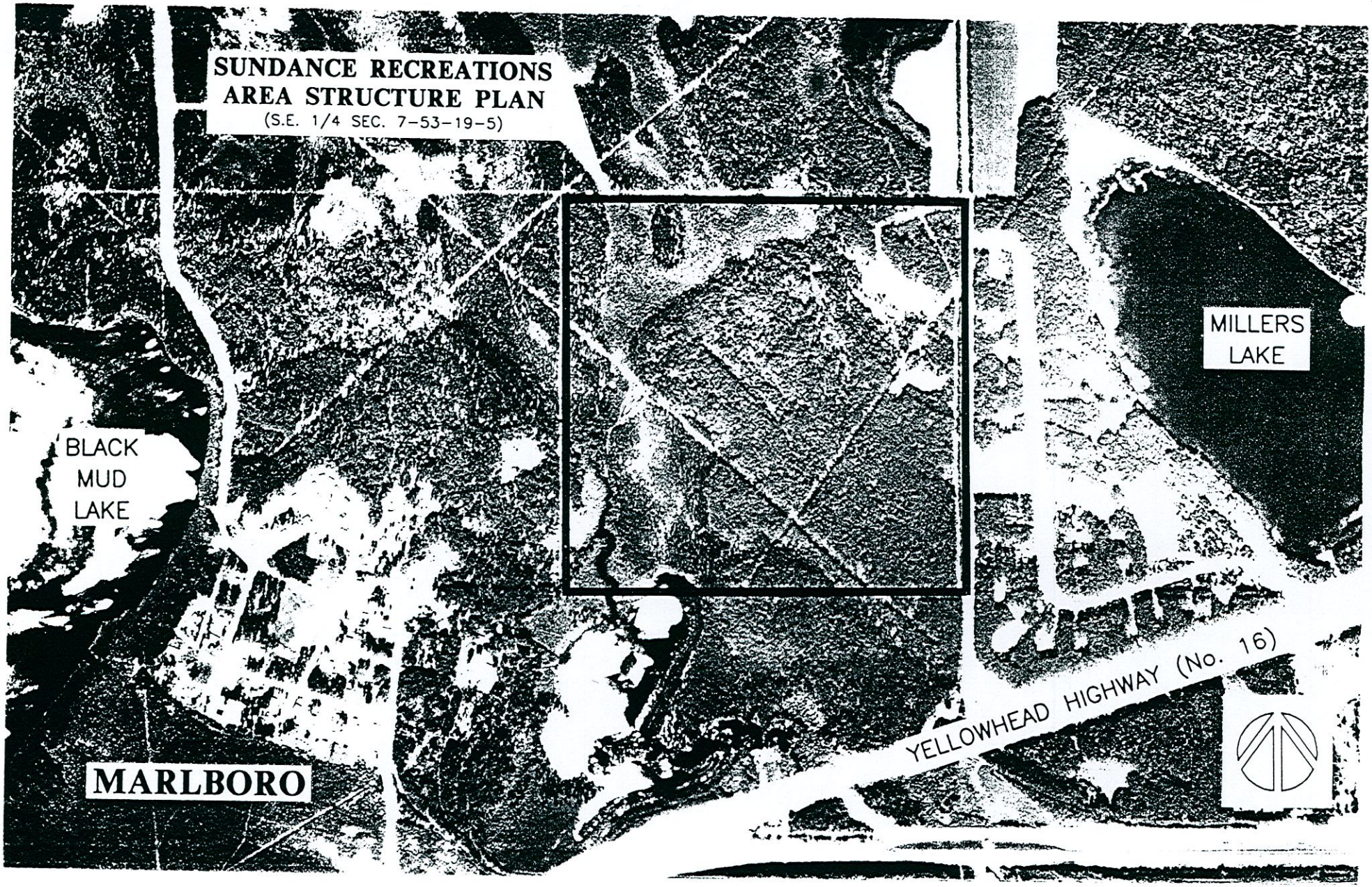


SUNDANCE RECREATIONS ASP

Context Plan

WALKER CONSULTING GROUP LTD.

FIGURE 1



SUNDANCE RECREATIONS ASP

Aerial Photograph

WALKER CONSULTING GROUP LTD.

FIGURE 2

3. POLICY BACKGROUND

Yellowhead Regional Plan

The Yellowhead Regional Plan was prepared as a guide to facilitate compatible developments within its boundaries. For the most part, the Regional Plan *(RP)* provides advice to municipalities and other agencies on how significant issues should be considered.

One goal of the RP is "to accommodate rural residential land use in the most suitable locations." Situated between Marlboro and the residential area at Millers Lake, the area of the ASP will take advantage of existing facilities and essentially create infill development.

Considering all objectives, the Sundance Recreations ASP conforms to the Yellowhead RP.

Municipal District of Yellowhead No. 94 General Municipal Plan

The purpose of the MD 94 General Municipal Plan *(GMP)* is to provide broad and general land use policies in assisting orderly, future development.

The document helps to ensure that there is a consistent approach to the many policy areas covered in the GMP. Existing agricultural lands, for example, are to be protected while minimizing the loss of better agricultural land. The area of the ASP, according to the "Soil Capability for Agriculture" prepared by Environment Canada, is not suitable for agricultural uses. *(Soil classes are described in the next section under Existing Features.)*

The ASP complies with the MD 94 GMP with regard to settlements, transportation and utilities, the natural environment, and all other relevant aspects.

Municipal District of Yellowhead No. 94 Land Use Bylaw

The Municipal District of Yellowhead No. 94 Land Use Bylaw *(LUB)* deals with specific items more applicable to plans of subdivision. However, in designing the general layout for the ASP the LUB has been used to ensure that subdivisions will incorporate or exceed minimum standards.

DEVELOPMENT CONCEPT

4. DEVELOPMENT STRATEGY

The development strategy for the Sundance Recreations ASP is to develop an area for country residential homes. As part of this strategy, the concept focuses on three basic objectives:

- to design an area appropriate for country residential development,
- to provide for utility and community services that enhance the value and safety of the community, *and*
- to maintain the creek and open water *(including the 1:100 year floodplain)* as a natural amenity.

These objectives are intended to create the Sundance Recreations ASP as a viable and successful area.

5. EXISTING FEATURES

The subject area includes both natural and developed features. In the northeast part of the plan there are two existing homes that are incorporated into the design, while the remainder of the quarter section is undeveloped.

The northern most residence *(Lot 1, Block 1, Plan 922-3471)* is accessed from Ranger Road and does not connect with the internal ASP collector loop. The southern residence, although it presently accesses Ranger Road, will form part of the central block of homes and have access from the internal roadway. There are also two existing cut lines running northeast and northwest that cross in the south area of the plan.

The undeveloped areas are characterized largely by Lodgepole Pine trees in the east and a mixture of Black and White Spruce and deciduous trees in the west. In addition, there is a creek in the southwest that flows into a body of water extending into the quarter section below. Elevations range from about 1,000 metres in the southeast down to the level of the water at about 977 metres. The rest of the land slopes gradually to the north and west.

The "Canada Land Inventory - Soil Capability for Agriculture" prepared by Environment Canada *(Edson 83 F map)* describes the agricultural capabilities for the lands within the Sundance Recreations ASP. This area is described as having Class 0 soils on the west side and Class 6 *(80%)* and 5 *(20%)* on the east. Class 0 consists of organic soils that are not placed in capability classes. The other two are limited in their capabilities for agricultural uses and do not fall within the Class 4 rating *(or better)* as defined for BETTER AGRICULTURAL LAND in the MD 94 GMP.

Existing features are presented in *Figure 3.*

6. LAND USE

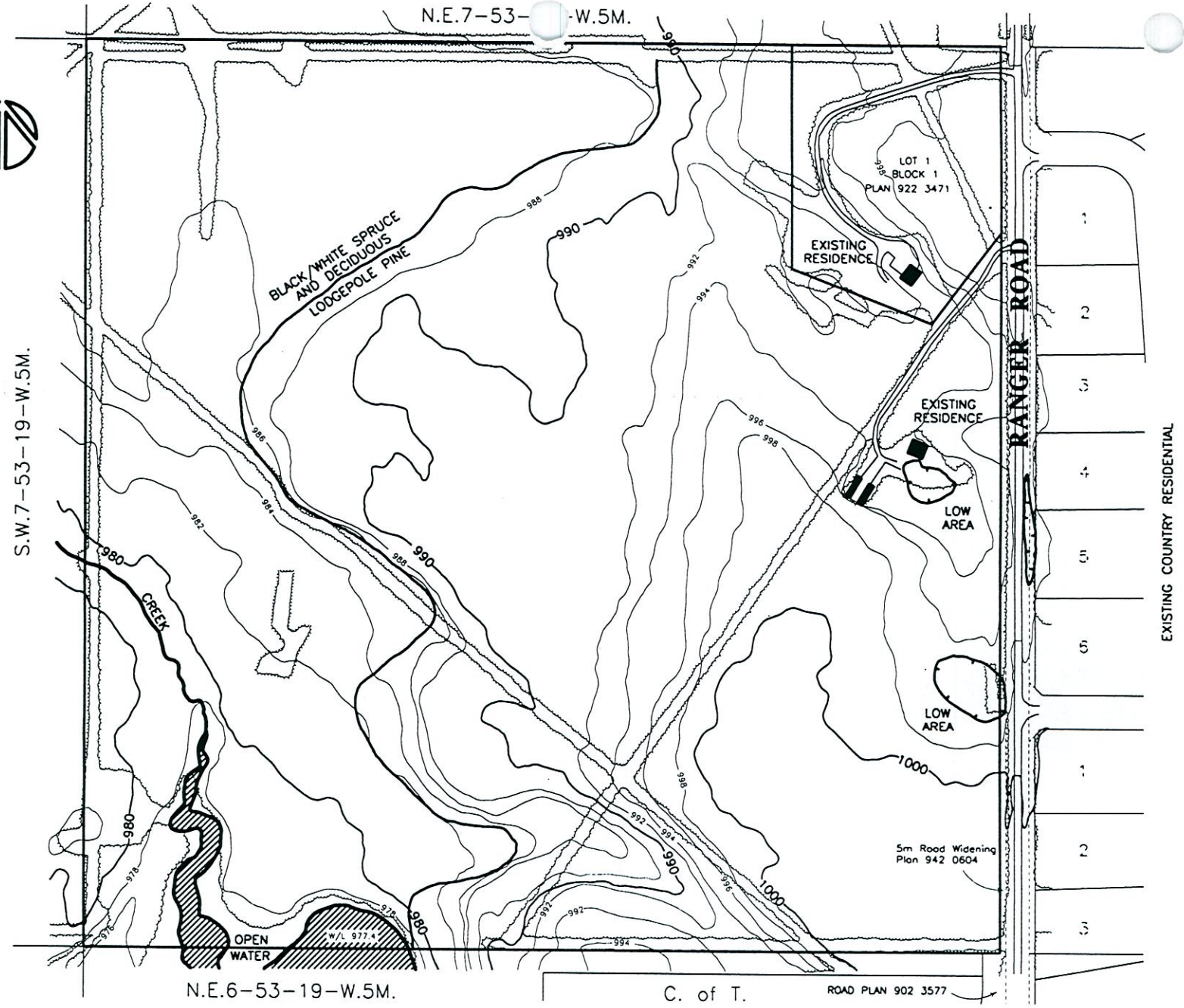
The ASP consists primarily of residential land. An internal collector roadway provides public access to all of the residential except for the existing home in the northeast *(accessed off Ranger Road).* The southwest area, including the creek and open water, is provided as environmental reserve.

Land use statistics for the ASP are shown in *Table 1* below.

TABLE 1

SUNDANCE RECREATIONS
AREA STRUCTURE PLAN
LAND USE STATISTICS

TOTAL ASP AREA	**64.71 ha**	**159.90 ac**	**100%**
Lot 1, Block 1, Plan 922-3471	4.05 ha	10.01 ac	6.3%
Ranger Road Widening	0.32 ha	0.79 ac	0.5%
Environmental Reserve	6.41 ha	15.83 ac	9.9%
NET DEVELOPABLE AREA	**53.93 ha**	**133.27 ac**	**83.3%**
Remaining Residential	50.43 ha	124.61 ac	77.9%
Internal Road	3.50 ha	8.66 ac	5.4%



SUNDANCE RECREATIONS ASP

Existing Features

WALKER CONSULTING GROUP LTD.

FIGURE 3

7. SPECIAL SEWAGE DISPOSAL REQUIREMENTS

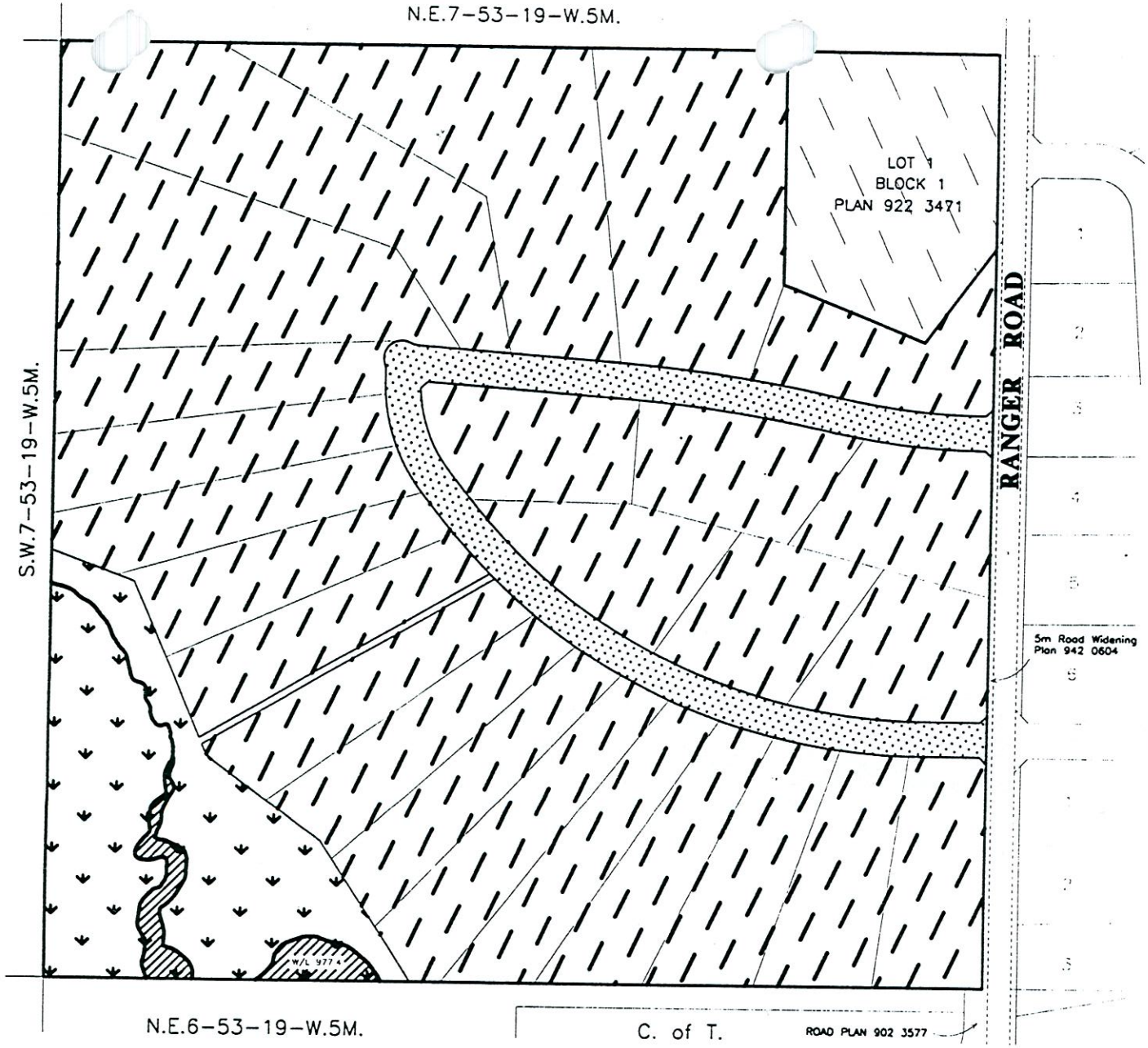
A geotechnical investigation within the developable areas was conducted by J.R. Paine & Associates in June of 1995 *(provided as the Appendix of this report)*. This report determined that the general groundwater table remains more than 3.0 metres below ground surface and dissipitation rates are higher than the minimum standards of Alberta Environmental Protection interim guidelines for residential subdivision. An additional environmental study will be required if a standard weeping lateral sewage disposal system is utilized or alternatively an approved installation by a professional engineer licensed to practice in the Province of Alberta or alternatively an approved installation by Alberta Labour for the soil conditions encountered in the geotechnical investigation. The developer will register an instrument on the title of each parcel to ensure compliance with this provision.

8. RESERVE AREA

The southwest of the ASP is shown as environmental reserve. This portion of the plan is set aside to preserve the natural character of the creek and open water. Its boundary is above the 980 contour to maintain a 2 metre drop to the water level.

There is no municipal reserve planned for the Sundance Recreations ASP.

Figure 4 shows the Development Concept for the Sundance Recreations ASP.



Schedule "A"

M.D. 94

Bylaw No. 27.95

LEGEND

- PROPOSED RESIDENTIAL (SPECIAL SEWAGE DISPOSAL REQUIREMENTS - SEE SECTION 7)
- EXISTING RESIDENTIAL PARCEL
- ENVIRONMENTAL RESERVE
- PROPOSED ROAD
- CREEK & OPEN WATER

SUNDANCE RECREATIONS ASP

Development Concept

WALKER CONSULTING GROUP LTD.

FIGURE 4

SERVICING

8. TRAFFIC CIRCULATION

Lot 1, Block 1, of Plan 922-3471 *(existing north residence)* and the land immediately south are the only residential areas with direct access to Ranger Road. All other residential parcels will have access to the internal collector road which in turn will discharge traffic out to Ranger Road. The south entrance to the ASP is directly across from an entrance into the residential at Millers Lake with the other located approximately 230 metres to the north.

9. COMMUNITY SERVICES

Police

Police services for the ASP will be conducted through the Edson Rural Detachment of the RCMP. Presently, the detachment serves a population of about 5,300 and has an officer/population ratio of 1:1043. With an average provincial ratio of 1:1041, the Edson Rural Detachment rates 88th out of 107 provincial detachments and is adequately staffed. The total number of residents anticipated for the Sundance Recreations ASP will not, of itself, require additional RCMP officers.

Health

The Alberta West Central Health Unit provides medical services to Edson and surrounding areas. With the Local Board of Health being replaced in March of 1995 by the Westview Regional Health Authority, it is anticipated that the level of medical services provided by the unit will increase over the next five years. Consequently, development within the Sundance Recreations ASP will not significantly impact upon the region's medical services and will be well served.

The Yellowhead Ambulance Service covers an area of nearly 10,000 square kilometres for a population of 12,000. *(All areas are within 1½ hours.)* The service uses two ambulances - one of which is a rescue vehicle - and receives between 45 and 50 calls per month. The Sundance Recreations ASP is not expected to affect current ambulance services.

Fire

Marlboro has its own volunteer fire department with one pumper truck and one water truck. The Sundance Recreations ASP will receive fire services from the Marlboro volunteer force.

Education

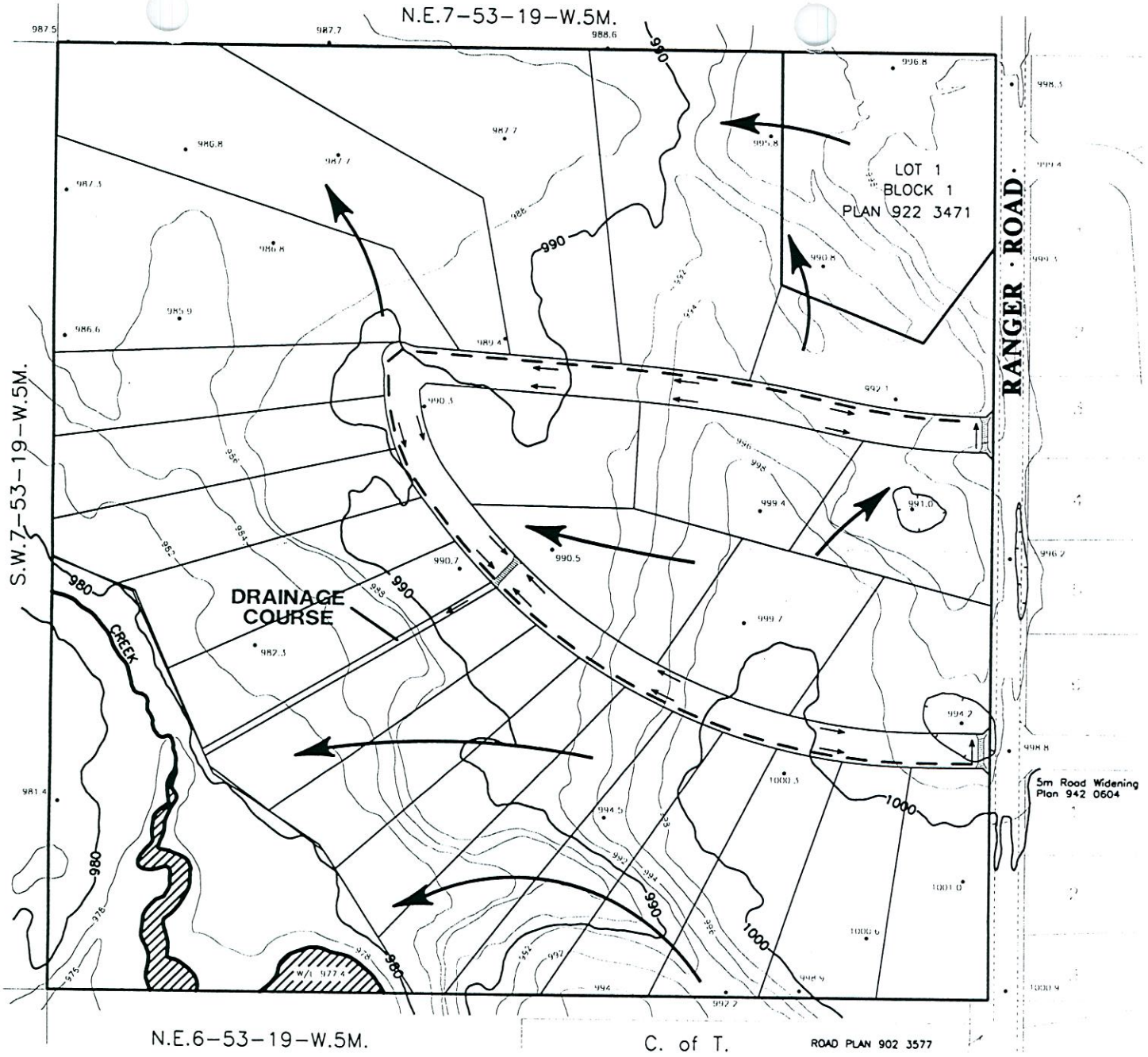
School aged children in Marlboro and surrounding areas are educated in Edson via an existing school buses service. Edson has four public elementary schools *(a total of 1,200 - 1,300 students)*, one public junior high school *(500 students)*, and one public senior high school *(500 students)*. The Separate School Board provides education for only those students living in Edson. Each of the public schools has plenty of available capacity - particularly the elementary schools - and the relatively few number of students that may live in the Sundance Recreations ASP will not significantly reduce this capacity.

10. UTILITY SERVICES

TransAlta Utilities, Yellowhead Gas Co-op and Alberta Government Telephones have facilities within the road allowance on the east boundary of the structure plan area which have the capacity to provide service to the proposed development. The proposed alignment of the utilities within the development is shown on *Figure 5*. Mains would be installed within the ditch around the outside of the crescent, with individual connections being made as required by customers.

Yellowhead Gas Co-op and Alberta Government Telephones will install buried facilities, while TransAlta Utilities' facilities will be overhead.

Natural drainage is predominately from the east central portion adjacent to the road allowance radiating north, west, and southwest to the existing drainage course. Construction of the internal road will interrupt the natural drainage pattern to some extent but the overall drainage pattern will be maintained by the grading of road-side ditches and installation of culverts where required. Roadside drainage, where it is necessary to direct it along the side of lots to a suitable drainage course, will be accommodated within a registered right-of-way.



LEGEND

- APPROXIMATE LOCATION OF YELLOWHEAD GAS CO-OP, TRANSALTA UTILITIES, & A.G.T.
- PROPOSED C.S.P. CULVERT
- NATURAL DRAINAGE
- DRAINAGE DIRECTION IN DITCHES

SUNDANCE RECREATIONS ASP

Servicing Concept

WALKER CONSULTING GROUP LTD

FIGURE 5

DENSITY AND STAGING

11. POPULATION AND HOUSING

The 1991 census compiled by Statistics Canada shows a population increase of 1.2% *(8,590 to 8,692)* for ID No. 14 *(MD 94)* from 1986. *(The enumeration area for Marlboro had 186 people in 1991.)* Average number of persons per household remained unchanged at 2.9.

For the purposes of this report, and with lot sizes ranging from 4.0 acres to 10.0 acres, the ASP is estimated to include 26 residential lots at an overall density of 0.40 units per hectare *(0.16 units per acre)*. Projected population estimates are calculated in *Table 2* below.

TABLE 2

SUNDANCE RECREATIONS
AREA STRUCTURE PLAN
POPULATION STATISTICS

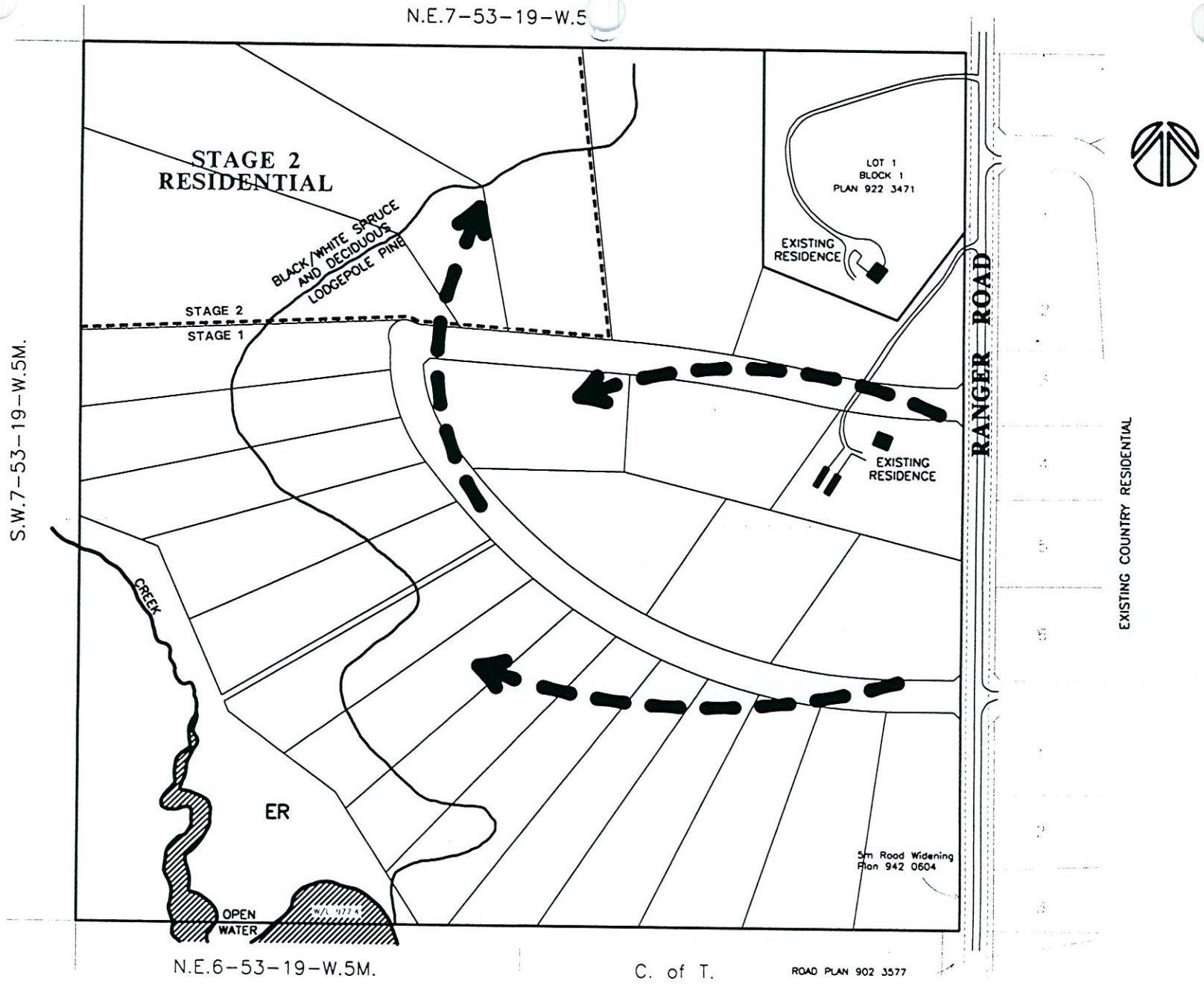
Total Plan Area	64.71 ha/159.9 ac
Estimated Number of Units	26
Overall Density	0.40 U.P.H./0.160 P.A.
*Persons per Household	2.9
TOTAL ESTIMATED POPULATION	**76**

*Carried forward from 1991 census.

12. SEQUENCE OF DEVELOPMENT

The sequence of development for the ASP will follow the logical extension of roads and services. The subdivision plan will likely be staged in order to accommodate an increase in demand. The first stage will construct all of the internal collector road with the exception of the cul-de-sac at the north end of the plan. This area - Stage 2 - incorporates an additional 40 acres of residential land. Each stage is proposed to have its own Servicing Agreement.

The sequence of development is shown in *Figure 6.*



SUNDANCE RECREATIONS ASP

Sequence of Development

WALKER CONSULTING GROUP LTD.

FIGURE 6

APPENDIX

J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

EDMONTON • GRANDE PRAIRIE • WHITEHORSE • PEACE RIVER

GEOTECHNICAL INVESTIGATION
PROPOSED ACREAGE SUBDIVISION
SE 7-53-19-5
NEAR MARLBORO, ALBERTA

FILE NO: 2949-1

GEOTECHNICAL INVESTIGATION
PROPOSED ACREAGE SUBDIVISION
SE 7-53-19-5
NEAR MARLBORO, ALBERTA

JUNE, 1995

J.R. PAINE & ASSOCIATES LTD.
3051 Parsons Road
EDMONTON, Alberta
T6N 1C8

Phone: 462-1288
Fax: 450-1664

FILE NO: 2949-1

GEOTECHNICAL INVESTIGATION
PROPOSED ACREAGE SUBDIVISION
SE 7-53-19-5
NEAR MARLBORO, ALBERTA

TABLE OF CONTENTS

J. R. Paine & Associates Ltd.

GEOTECHNICAL INVESTIGATION

PROJECT: Proposed Acreage Subdivision

LOCATION: SE 1/4 of Sec 7, Twp 53, Range 19, W5
Near Marlboro
West of Edson

CLIENT: SUNDANCE RECREATIONS
P.O. Box 6422
EDSON, Alberta
T7E 1T8

INTRODUCTION

This report presents the results of the subsurface investigation conducted at the site of the proposed acreage subdivision located in the Southeast quarter of Section 7, Township 53, Range 19, West of the Fifth Meridian near Edson, Alberta. The objectives of the investigation were to establish the subsoil data necessary for use in the design and construction aspects of the proposed subdivision.

Authorization to proceed was received from Mr. Pat Barker of Walker Consulting Group. Fieldwork was completed during May of 1995.

SITE DESCRIPTION

The proposed residential development is situated in SE 7-53-19-5, approximately 24 km west of Edson, Alberta. The study areas encompasses 150 acres. It is understood that this site will be subdivided into 21 acreage lots and serviced from the existing N-S road allowance by a single road loop. The subject property lies immediately west of the existing Miller Lakes acreage subdivision. Highway 16 is located approximately 1/2 km south of the site.

The eastern 3/4 portion of the subject property lies within a slightly undulating landscape inhabited by a moderate cover of native poplar and spruce forest. The surfacial drainage is not well defined although it does appear that overall topographic relief falls gently in a northwesterly direction. Of note is the presence of a localized depression at approximately the midpoint of the property N-S, centered on the east boundary. The depression lies an estimated 4 meters in elevation below the surrounding ground surface. Up to 3 meters of vertical relief can be observed throughout the remainder of the slightly irregular poplar/spruce forested area.

Muskeg occupies the western 1/4 portion of the proposed subdivision. The transition from the forest to the muskeg areas is clearly defined in the field by a sharp ledge descending sharply an estimated 4 to 5 meters in elevation. The muskeg is inherently wet with areas of open bog. A number of proposed lots within the southwest quadrant of the development extend beyond the eastern limit of the muskeg. Several lots adjoin an environmental reserve situated at the southwest corner of the noted quarter section.

FIELD INVESTIGATION

The field investigation for this project was performed on May 24, 1995. A testhole drilling program was implemented utilizing a 250 diameter continuous flight, solid stem auger mounted on a rubber tired backhoe excavator. The drilling depth of each testhole was limited to 3.0 meters. The testhole drilling program was supplemented by percolation testing. Percolation holes were placed adjacent to each testhole. These holes were hand augered to diameters and depths of 200mm and 900mm respectively.

A total of 10 locations were drilled and tested for percolation rates. The test locations are illustrated on the attached site plan. The locations were chosen on the basis of site access and where disturbance to the area would be limited. Testholes 95-1, 95-2, 95-6, and 95-7

located within existing cutline clearings. Testhole 95-6 was purposely placed at the low point of a local depression. Recognizing (from earlier drilling) that water tables were more than 3.0 meters below the ground surface), it was felt that a testhole at this location would help determine the depth of watertable throughout the study area. Testholes 95-4 and 95-9 were located within a trail which parallels the noted muskeg ledge. All remaining testholes were accessed by winding through less density populated portions of forest.

A continuous visual log of the soils encountered was maintained in the field during the drilling operation. Noted was organic cover, soil classifications, changes in soil profile, moisture conditions, relative grainsize, color, and any other pertinent observations. Soil samples were removed from the auger at depth intervals of 0.6m, 1.2m, 1.8m and 3.0m. Each sample was tested for moisture content. Selected samples were further tested for grainsize distribution using the hydrometer and mechanical sieve methods. Atterberg limit tests were performed on one sample removed from Testhole 95-6 where soil conditions appeared cohesive. Due to granular conditions throughout, no other Atterberg limit testing was performed. It was originally intended to cover each testhole (once drilled) for future water table measuring. Due to the nature of the soils encountered, it was deemed that water levels would have stabilized almost immediately upon drilling. The driller was, therefore, authorized to backfill the testholes on the day following drilling. Percolation testing was performed following the testhole drilling program. Land Use Branch, Alberta Environmental Protection, "Interim Guidelines of the Evaluation of Water Table Conditions and Percolation Rate for Unserviced Residential Subdivisions" was used as a reference for percolation testing. All percolation holes were hand augered to depths of approximately 900 mm although sloughing during the soaking and testing periods resulted in a slightly shallower hole. It is noted that rapid dissipation of the initial soak enabled percolation testing to proceed shortly after the drilling program.

SUBSURFACE SOIL CONDITIONS

Refer to the individual testhole logs and grainsize distribution plots for information specific to each test location. In general, a surface mantle of fibrous organic cover was

encountered at each testhole location. Depths of organic varied from 75mm to 150mm with an average depth of 100mm.

The native inorganic soil deposits encountered to termination depth at all locations (excluding testhole 95-6) were predominately fine to medium grained sands. The mode of deposition is uncertain at this time. Given the proximity to an existing creek to the west and transitional soil profile encountered, it is speculated that the land form may be associated with a terrace of fluvial outwash deposits. The sands, in all testholes where encountered, exhibited some silt to silty conditions throughout the upper 1.2 to 1.8 meters. Fines contents of 15 to 30 percent were noted. The soils below this depth were notably cleaner, exhibiting fines contents of less than 5 percent. It was also noted that grainsize distribution was coarsest closest to the muskeg where some small gravel sizes were encountered. Sand sizes were typically uniform with the majority of grainsizes ranging from 0.63mm to 0.16mm in nominal size. As such, the sands are of fine to medium grainsize and of poor gradation. In all cases, the sands were damp to moist and in a medium dense state.

A continuous deposit of silt was encountered at testhole 95-6. The silt was moist and of firm to soft consistency. Some moisture was emanating from a thin frozen zone approximately 1.4 meters below the ground surface. The testhole had filled to this level with water by the end of the drilling program.

No groundwater or evidence of groundwater was encountered within the sand subsoils. It is the writer's experience that groundwater accumulations will have materialized particularly where sand conditions are clean and free draining. Further, no evidence of increased moisture within the sand soils was noted as is normally the case where cyclic (or seasonal) high groundwater leave behind residual moisture. As such, it is the opinion of the writer that the general groundwater table is controlled by the muskeg and remains more than 3.0 meters below the ground surface (at all locations outside the localized depression).

Results of the percolation tests reveal rapid infiltration rates with exception to Testhole 95-6. All percolation rates were less than 5 min./2.5 cm and, in the locations of Testhole 95-1 and 95-4, less than 1 min/2.5 cm. These rapid draw down rates are as expected given the granular characteristics of the subsoils throughout this site. Exception was noted at Testhole location 95-6 where an average percolation rate of 27 min/2.5 mm was measured.

RECOMMENDATIONS

It is understood that all acreage lots proposed for this development will contain an area of at least one acre of land above and beyond the muskeg terrain inhabiting the western portions of the subdivision. Outside the localized depression previously noted, the soil conditions encountered throughout the poplar/spruce forest inhabiting most of the site are favourable for standard house foundation construction. The site is considered geotechnically feasible for the intended subdivision. The granular nature of the soils do, however, yield rapid septic field sewage percolation rates and may require alternative disposal methods.

A. House Foundations

The sand subsoils yield adequate bearing capacity for standard house footing foundations. An allowable bearing capacity of at least 150 kPa should be realized. Standard house footing sizes of 450mm width by 150mm depth should be adequate for most houses constructed throughout the site. All footings should be provided with a cover of at least 1.5 meters as measured from the bottom of footing to the top of the adjacent ground surface. This will provide adequate frost protection.

Due to the potential of sloughing conditions, basement excavations should be cut back, from the vertical, at least 45°. No loose, slough, or excessively disturbed soils should remain at footing elevation. It is advised that hand cleaning be performed where an acceptable surface not be prepared by mechanical equipment. Footing excavations should be protected from drying, rain, snow, freezing and the ingress of surface water. It is recommended that floor joists and basement slabs be placed prior to backfilling the excavation in order to minimize any detrimental effects on the foundation walls caused by backfilling operations. Positive drainage away from all house foundations should be provided. This will require a positive lot grading of at least 5 percent. A splash pad or permanent downspout extension should carry water from the roof leaders at least 1.5m away from the house.

B. Sewage Disposal

Percolation tests performed throughout all developable portions of the subdivision exhibited rapid dissipation rates, all of which were less than 5 min/2.5 cm. it is noted that Alberta Environmental Protection suggests rates of between 5 min/2.5 cm and 60 min/2.5 cm for septic field percolation. Additional environmental study would be required if considering septic field discharge of domestic sewage. As an alternative, holding tanks or an evaporation mound system may be considered. The local branch of Alberta Labor, Gas and Plumbing Division, should be contacted for details regarding the design and installation details of an evaporation mound.

C. Road Construction

The sand subsoils encountered throughout this site are considered to be good for the construction of the main access road. The sands do offer good subgrade drainage characteristics. All organic soils should be removed from the road area prior to construction. Where embankment fill is required, the native sands or an imported lean clay or gravel may be considered. All fill should be placed in lifts not exceeding 300mm and recompacted to a minimum of 97 percent of the standard proctor density. All embankment side slopes and backslopes should be maintained at grades not steeper than 4H:1V and vegetated as soon as possible to minimize erosion. The standard subgrade preparation will require scarification of the subgrade soils to a depth of 150mm and recompacted to a minimum of 100 percent of the standard proctor density at optimum moisture content. Pavement designs can be provided upon request.

CLOSURE

This report has been prepared for the exclusive and confidential use of Sundance Recreations and Walker Consulting Group Ltd. Use of this report is limited to the noted residential subdivision only. The recommendations given are based on the subsurface soil conditions encountered during test boring, current construction techniques, and generally accepted engineering practices. No other warranty, expressed or implied, is made. Due to geological randomness of many soils formations, no interpolation of soil

.../7

conditions, other than those encountered has been made or implied. Soil conditions are known only at the test boring location. Should other soils be encountered during construction or other information pertinent become available, the recommendations may be altered or modified in writing by the undersigned.

We trust this information is satisfactory. If you should have any further questions, please contact our office.

RESPECTIVELY SUBMITTED,
J.R. PAINE & ASSOCIATES LTD.

APPROVED BY

PERMIT TO PRACTICE
JR PAINE & ASSOCIATES LTD.
Signature R. Stefaniw
Date June 6/95
PERMIT NUMBER: P 401
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

PROFESSIONAL ENGINEER ALBERTA
ALAN LANG
June 95

Roman Stefaniw, P. Eng.

Al Lang, P. Eng.

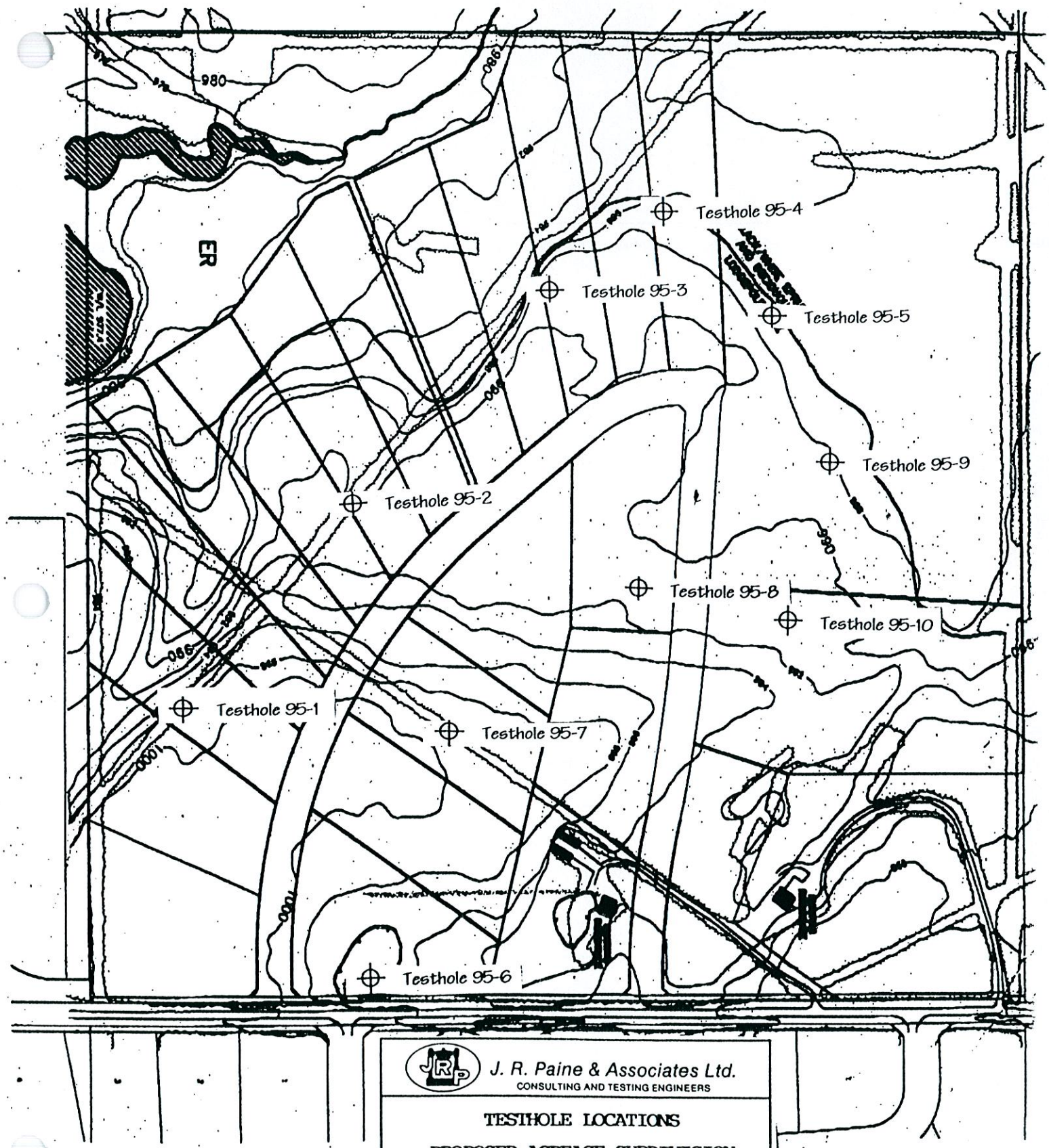
AL/sc/R0211SUN

APPENDIX A

Schedule "A"

M.D. 94

Bylaw No. 27.95



J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

TESTHOLE LOCATIONS
PROPOSED ACREAGE SUBDIVISION
SE 7-53-19-5, Near Edson

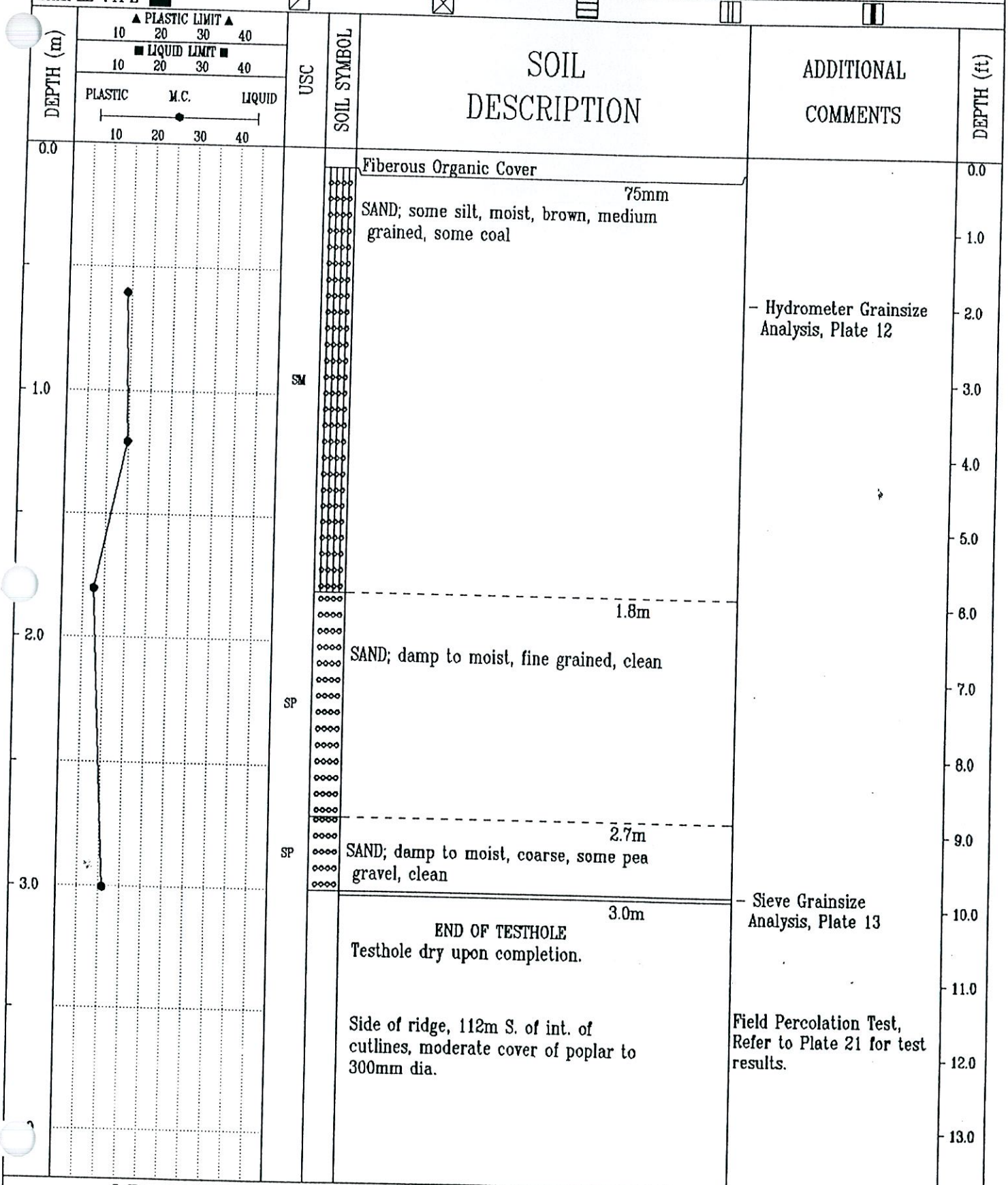
Dwn. By	Date May/june '95
Scale	Plate No. 1 of 21

SUNDANCE E
NOT TO SCA 5
WALKER CON.

Schedule "A" | M.D. 94 | Bylaw No. 27.95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-1
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:

SAMPLE TYPE ■ ▨ ⊠ ▤ ▯ ◧



J.R. PAINE & ASSOCIATES
Edmonton, Alberta

LOGGED BY:	COMPLETION DEPTH: 3.0 m
REVIEWED BY: A.L.	COMPLETE: 05/24/95
Fig. No: 2 of 21	Page 1 of 1

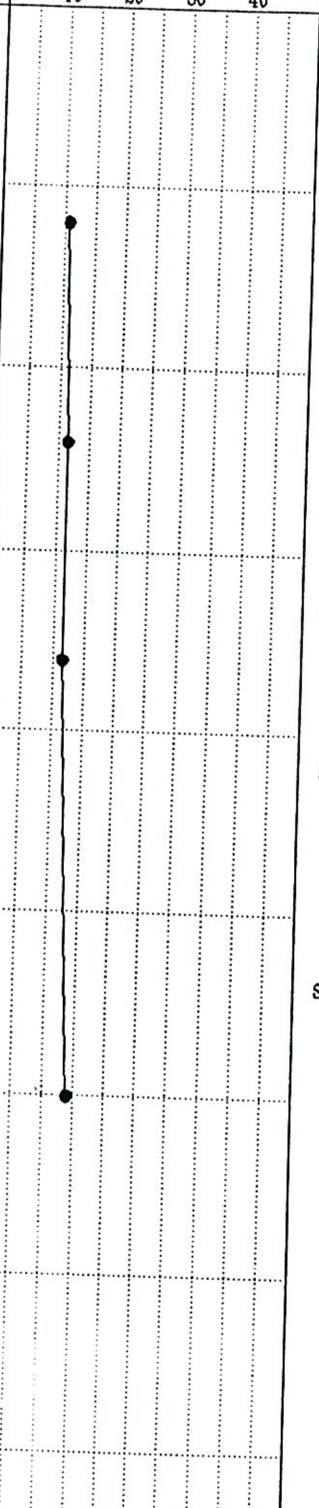
95/06/08 11:57AM

Schedule "A" — M.D. 94 — Bylaw No. 27-95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-2
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:

SAMPLE TYPE

▲ PLASTIC LIMIT ▲ 10 20 30 40
■ LIQUID LIMIT ■ 10 20 30 40
PLASTIC — M.C. — LIQUID 10 20 30 40



DEPTH (m)	USC	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0		Fiberous Organic Cover		0.0
	SM	100mm SAND; some silt, moist, brown, fine to med grained, trace of coal		1.0 – 4.0
	SP	1.5m SAND; moist, med grained, coal, brown-grey		5.0
2.0	SP	1.8m SAND; damp to moist, fine grained, clean		6.0 – 8.0
	SP	2.7m SAND; damp to moist, med to coarse grained clean		9.0
3.0		3.0m END OF TESTHOLE Testhole dry upon completion. Moderate spruce cover to 350mm dia., some poplar.	Field Percolation Test, Refer to Plate 21 for test results.	10.0 – 12.0
4.0				13.0

J.R. PAINE & ASSOCIATES Edmonton, Alberta	LOGGED BY:	COMPLETION DEPTH: 3.0 m
	REVIEWED BY: A.L.	COMPLETE: 05/24/95
	Fig. No: 3 of 21	Page 1 of 1

95/06/08 11:56AM

Schedule "A" M.D. 94 Bylaw No. 27.95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-3
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:
SAMPLE TYPE ■ ▨ ⊠ ▤ ▥ ◧		

▲ PLASTIC LIMIT ▲ 10 20 30 40
■ LIQUID LIMIT ■ 10 20 30 40
PLASTIC M.C. LIQUID 10 20 30 40

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0			Fiberous Organic Cover		0.0
			100mm		
	SM		SAND; silty, moist, brown, fine grained		1.0
				- Hydrometer Grainsize Analysis, Plate 14	2.0
1.0			- weathered coal seam intermixed @ 0.9m		3.0
			1.1m		
	SP		SAND; moist, med grained, brown, trace of silt		4.0
			1.5m		5.0
2.0			SAND; damp to moist, med to coarse grained		6.0
	SP				7.0
					8.0
			clean		9.0
3.0			3.0m		10.0
			END OF TESTHOLE Testhole dry upon completion.		
					11.0
			Located at edge of ridge decsending sharply to the north approx. 4-5m in elev. Sparse to moderate cover of mature poplar to 450mm dia.	Field Percolation Test, Refer to Plate 21 for test results.	12.0
4.0					13.0

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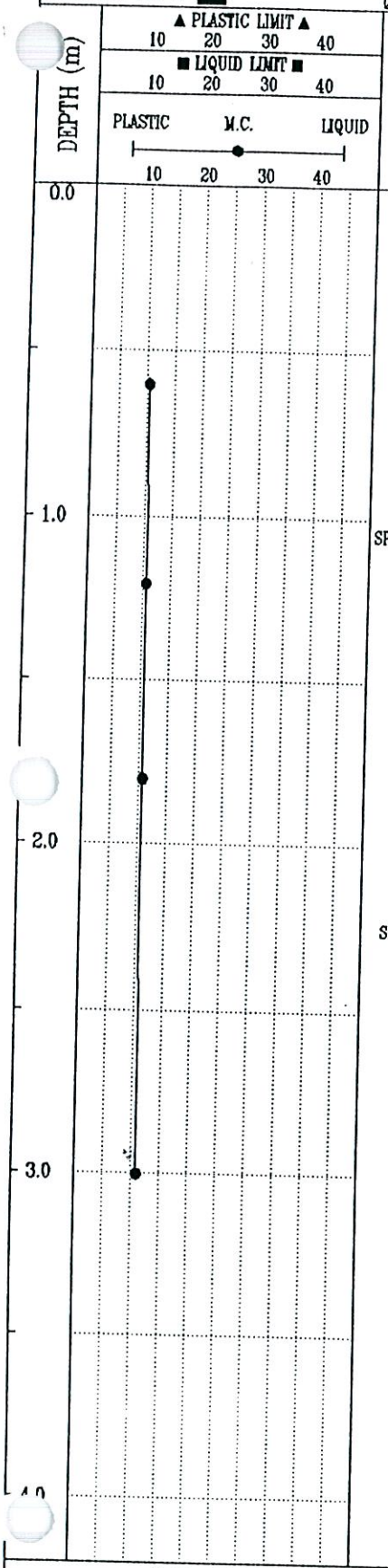
Edmonton, Alberta

LOGGED BY:	COMPLETION DEPTH: 3.0 m
REVIEWED BY: A.L.	COMPLETE: 05/24/95
Fig. No: 4 of 21	Page 1 of 1

95/08/08 11:56AM

Schedule "A" | M.D. 94 | Bylaw No. 27.95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-4
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:
SAMPLE TYPE ■ ▨ ⊠ ▤ ▥ ◧		



USC	SOIL SYMBOL	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
		Fiberous Organic Cover		0.0
		100mm		
SM		SAND; silty, moist, brown, fine grained some coal		1.0
		0.6m		2.0
SP-SM		SAND; moist, med grained, brown, trace of silt	– Sieve Grainsize Analysis, Plate 15	3.0 4.0
		1.5m		5.0
SP		SAND; damp to moist, medium grained		6.0 7.0 8.0
		clean		9.0
		3.0m		10.0
		END OF TESTHOLE Testhole dry upon completion.		11.0
		Located at western-most point of ridge. Moderate cover of spruce & poplar mix	Field Percolation Test, Refer to Plate 21 for test results.	12.0 13.0

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LOGGED BY:	COMPLETION DEPTH: 3.0 m
REVIEWED BY: A.L.	COMPLETE: 05/24/95
Fig. No: 5 of 21	Page 1 of 1

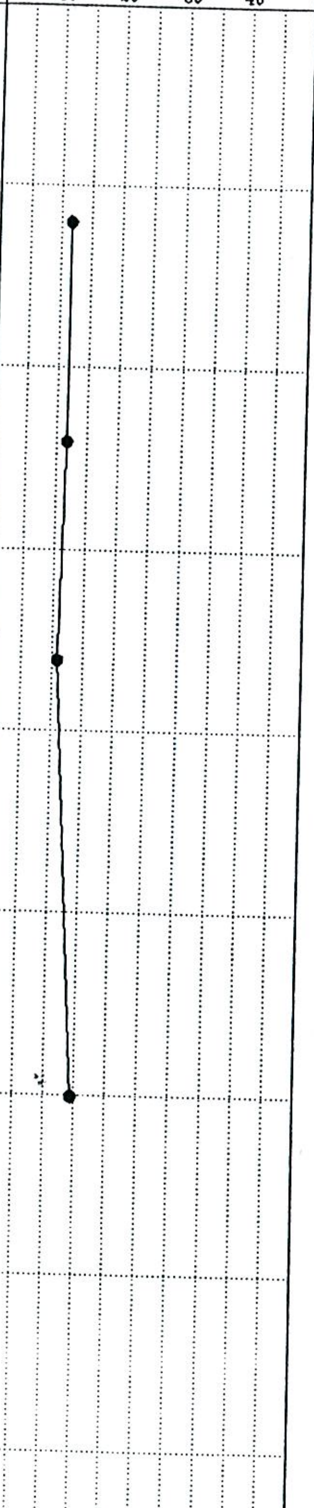
05/06/96 02:21PM

Schedule "A" | M.D. 94 | Bylaw No. 27 95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-5
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:

SAMPLE TYPE

DEPTH (m)	▲ PLASTIC LIMIT ▲ 10 20 30 40 / ■ LIQUID LIMIT ■ 10 20 30 40 / PLASTIC M.C. LIQUID 10 20 30 40	USC	SOIL SYMBOL	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0				Fiberous Organic Cover		0.0
		SP-SM		100mm SAND; gravelly, trace of silt, damp, med. to coarse grained, grey-brown	– Hydrometer Grainsize Analysis, Plate 16	1.0 2.0 3.0 4.0
1.0 2.0		SP		1.5m SAND; damp to moist, medium grained clean, grey-brown		5.0 6.0 7.0 8.0 9.0
3.0 4.0				3.0m END OF TESTHOLE Testhole dry upon completion. Some marginal frost @ 1.2-1.5m Near top edge of ridge descending moderately to the north. Moderate cover of spruce & poplar mix.	Field Percolation Test, Refer to Plate 21 for test results.	10.0 11.0 12.0 13.0

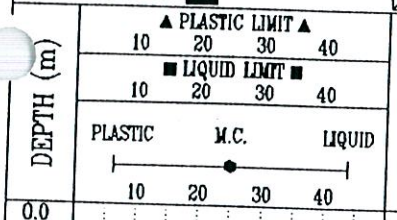


J.R. PAINE & ASSOCIATES Edmonton, Alberta	LOGGED BY:	COMPLETION DEPTH: 3.0 m
	REVIEWED BY: A.L.	COMPLETE: 05/24/95
	Fig. No: 6 of 21	Page 1 of 1

95/08/08 12:00PM

Schedule "A" M.D. 94 Bylaw No. 27.95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-6
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:
SAMPLE TYPE ■ ▨ ⊠ ▤ ▥ ◧		



DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0			Fiberous Organic Cover		0.0
			150mm		
	ML		SILT; brown, moist, some sand, trace of clay, firm to soft, slow seepage @ 1.2m	- Hydrometer Grainsize Analysis, Plate 17	1.0
1.0					2.0
					3.0
					4.0
					5.0
					6.0
2.0					7.0
					8.0
					9.0
3.0			3.0m		10.0
			END OF TESTHOLE Testhole dry upon completion. Some marginal frost @ 1.2m. Located in localized depression approx. 4.0m in elevation below surrounding landscape. Willow, spruce, and poplar mix	Field Percolation Test, Refer to Plate 21 for test results.	11.0
					12.0
4.0					13.0

J.R. PAINE & ASSOCIATES
Edmonton, Alberta

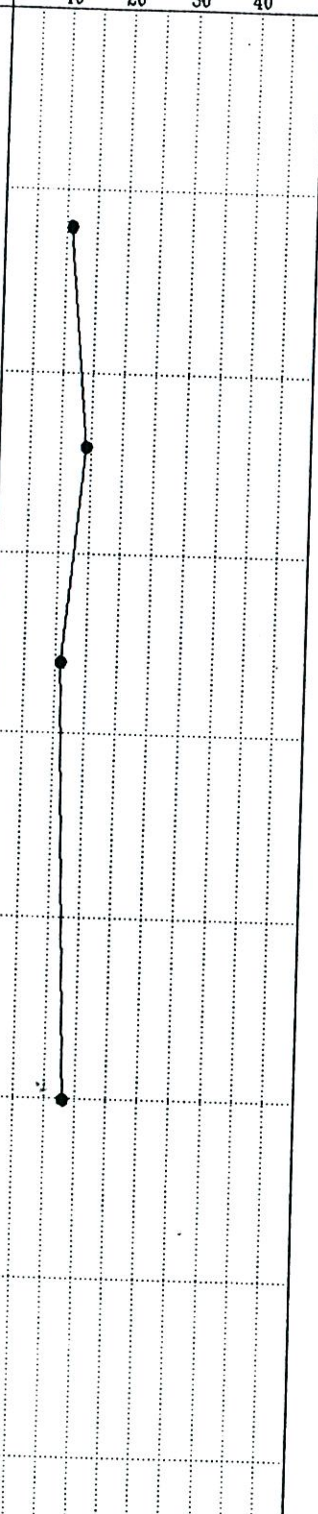
LOGGED BY:	COMPLETION DEPTH: 3.0 m
REVIEWED BY: A.L.	COMPLETE: 05/24/95
Fig. No: 7 of 21	Page 1 of 1

95/06/08 12:51PM

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-7
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:

SAMPLE TYPE

▲ PLASTIC LIMIT ▲ 10 20 30 40
■ LIQUID LIMIT ■ 10 20 30 40
PLASTIC M.C. LIQUID 10 20 30 40



DEPTH (m)	USC	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0		Fiberous Organic Cover		0.0
	SM	100mm SAND; some silt, damp to moist, fine to medium grained, brown, some coal	- Hydrometer Grainsize Analysis, Plate 18	1.0, 2.0, 3.0
1.0, 2.0	SP	1.2m SAND; damp to moist, fine grained clean, brown, trace of coal		4.0, 5.0, 6.0, 7.0, 8.0, 9.0
3.0, 4.0		3.0m END OF TESTHOLE Testhole dry upon completion. Slightly uneven topography, moderate poplar cover to 250mm dia. few spruce intermixed	Field Percolation Test, Refer to Plate 21 for test results.	10.0, 11.0, 12.0, 13.0

J.R. PAINE & ASSOCIATES Edmonton, Alberta	LOGGED BY:	COMPLETION DEPTH: 3.0 m
	REVIEWED BY: A.L.	COMPLETE: 05/24/95
	Fig. No: 8 of 21	Page 1 of 1

Schedule "A" M.D. 94 Bylaw No. 27.95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-8
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:
SAMPLE TYPE ■ ⊘ ⊠ ▤ ▥ ▥		

DEPTH (m)	▲ PLASTIC LIMIT ▲ / ■ LIQUID LIMIT ■ (10 20 30 40) / PLASTIC M.C. LIQUID (10 20 30 40)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0				Fiberous Organic Cover		0.0
				100mm SAND; some silt, damp, fine grained, brown		1.0
1.0		SM				2.0
						3.0
						4.0
						5.0
2.0						6.0
				2.1m SAND; damp to moist, fine to medium		7.0
		SP				8.0
				grained, clean, brown		9.0
3.0						10.0
				3.0m END OF TESTHOLE Testhole dry upon completion.		11.0
				Moderate cover of mature poplar, few spruce, gentle ascent westerly	Field Percolation Test, Refer to Plate 21 for test results.	12.0
4.0						13.0

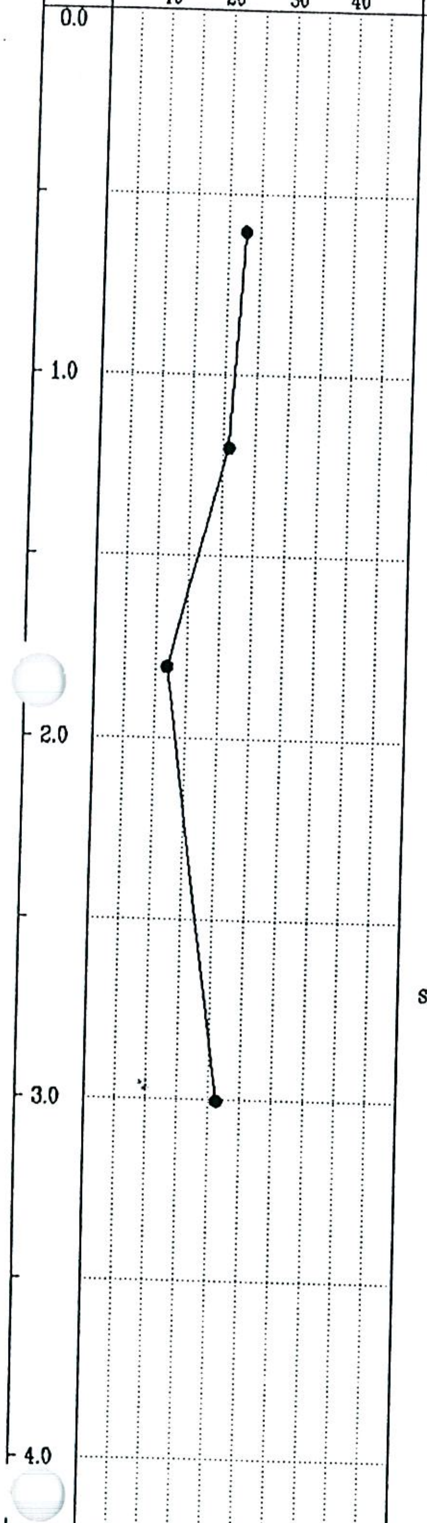
J.R. PAINE & ASSOCIATES Edmonton, Alberta	LOGGED BY:	COMPLETION DEPTH: 3.0 m
	REVIEWED BY: A.L.	COMPLETE: 05/24/95
95/06/06 12:02PM	Fig. No: 9 of 21	Page 1 of 1

Schedule "A" | M.D. 94 | Bylaw No. 27.95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-9
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:

SAMPLE TYPE

DEPTH (m)	▲ PLASTIC LIMIT ▲ 10 20 30 40 / ■ LIQUID LIMIT ■ 10 20 30 40 / PLASTIC M.C. LIQUID 10 20 30 40	USC	SOIL SYMBOL	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0				Fiberous Organic Cover		0.0
		SM		100mm SAND; some silt, damp, fine grained, brown		1.0 – 7.0
1.0 – 2.0		SP		2.4m SAND; damp to moist, fine to medium grained, clean, brown		8.0 – 9.0
3.0				3.0m END OF TESTHOLE. Testhole dry upon completion. Dense cover of young spruce	Field Percolation Test, Refer to Plate 21 for test results.	10.0 – 13.0
4.0						



J.R. PAINE & ASSOCIATES Edmonton, Alberta	LOGGED BY:	COMPLETION DEPTH: 3.0 m
	REVIEWED BY: A.L.	COMPLETE: 05/24/95
	Fig. No: 10 of 21	Page 1 of 1

95/06/08 12:03PM

Schedule "A" M.D. 94 Bylaw No. 27.95

Sundance Recreations	Driller: Gideon Contracting Ltd.	TEST HOLE NO: 95-10
Proposed Acreage Subdivision	Equipment: Backhoe-auger attachment	PROJECT NO: 2949-1
PROJECT ENGINEER: A.L.	Method: 250mm dia, Solid stem auger	ELEVATION:
SAMPLE TYPE ■ ▨ ⊠ ▤ ▥ ◧		

DEPTH (m)	▲ PLASTIC LIMIT ▲ / ■ LIQUID LIMIT ■ (10 20 30 40) / PLASTIC M.C. LIQUID	USC	SOIL SYMBOL	SOIL DESCRIPTION	ADDITIONAL COMMENTS	DEPTH (ft)
0.0				Fiberous Organic Cover		0.0
				75mm		
				SAND; some silt, moist, brown, medium grained		1.0
					- Hydrometer Grainsize Analysis, Plate 19	2.0
1.0		SM				3.0
						4.0
						5.0
						6.0
2.0				2.1m		7.0
				SAND; damp to moist, medium grained, clean brown		8.0
		SP				9.0
3.0						
				3.0m	- Sieve Grainsize Analysis, Plate 20	10.0
				END OF TESTHOLE Testhole dry upon completion.		11.0
				Relatively flat, young cover of willow and poplar growth	Field Percolation Test, Refer to Plate 21 for test results.	12.0
4.0						13.0

J.R. PAINE & ASSOCIATES Edmonton, Alberta	LOGGED BY:	COMPLETION DEPTH: 3.0 m
	REVIEWED BY: A.L.	COMPLETE: 05/24/95
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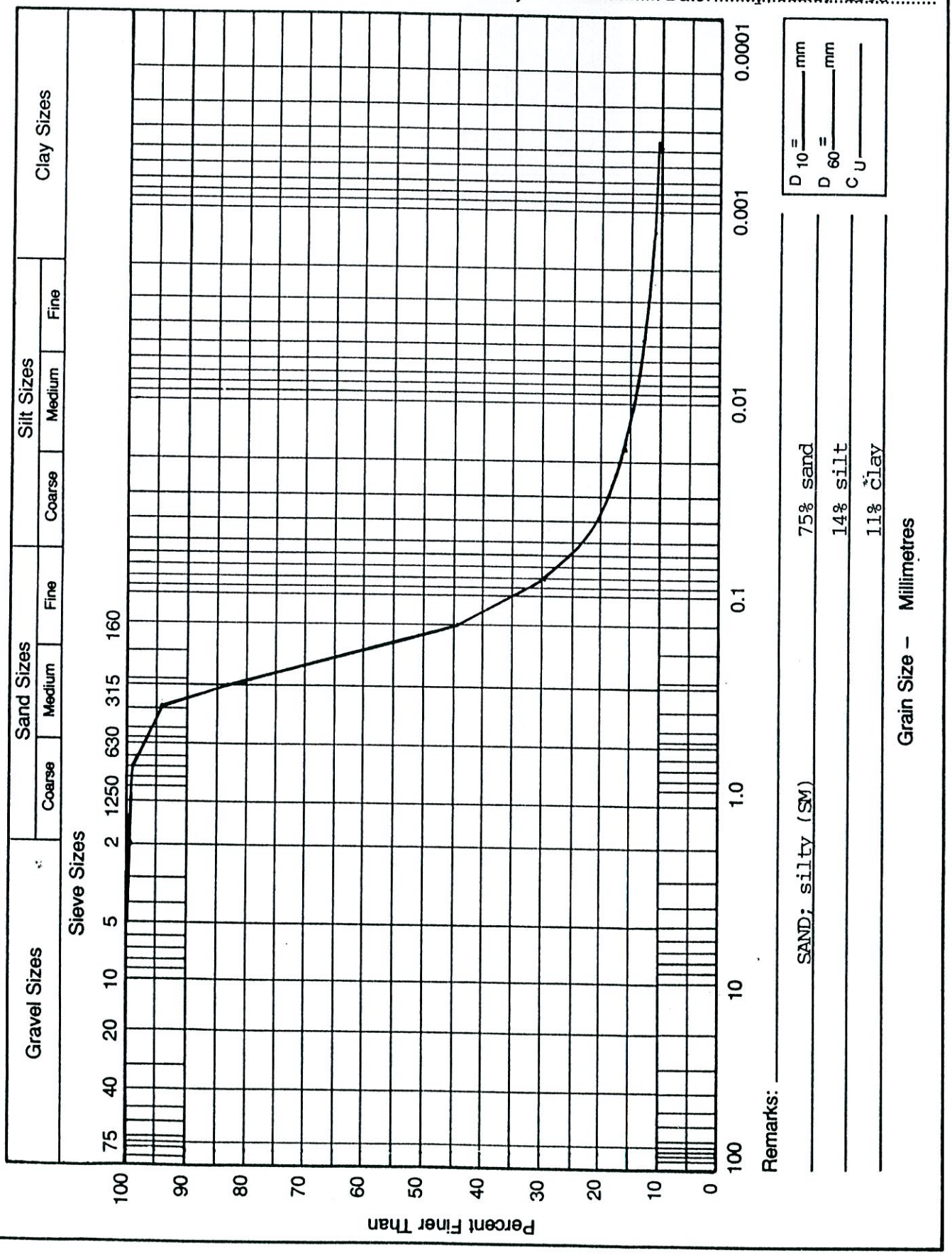
Schedule "A" M.D. 94 Bylaw No. 27.95

J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

GRAIN SIZE CURVE

Client: SUNDANCE RECREATIONS
Project: PROPOSED ACREAGE SUBDIVISION
Sample: ..... Depth: 0.6m
Location: Testhole 95-1
Made by: GB Job No. 2949-1
Ck'd by: AL Date: May/June, 1995



Remarks:

SAND; silty (SM) 75% sand

14% silt

11% clay

J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: _____ Depth: 3.0m
Location: Testhole 95-1

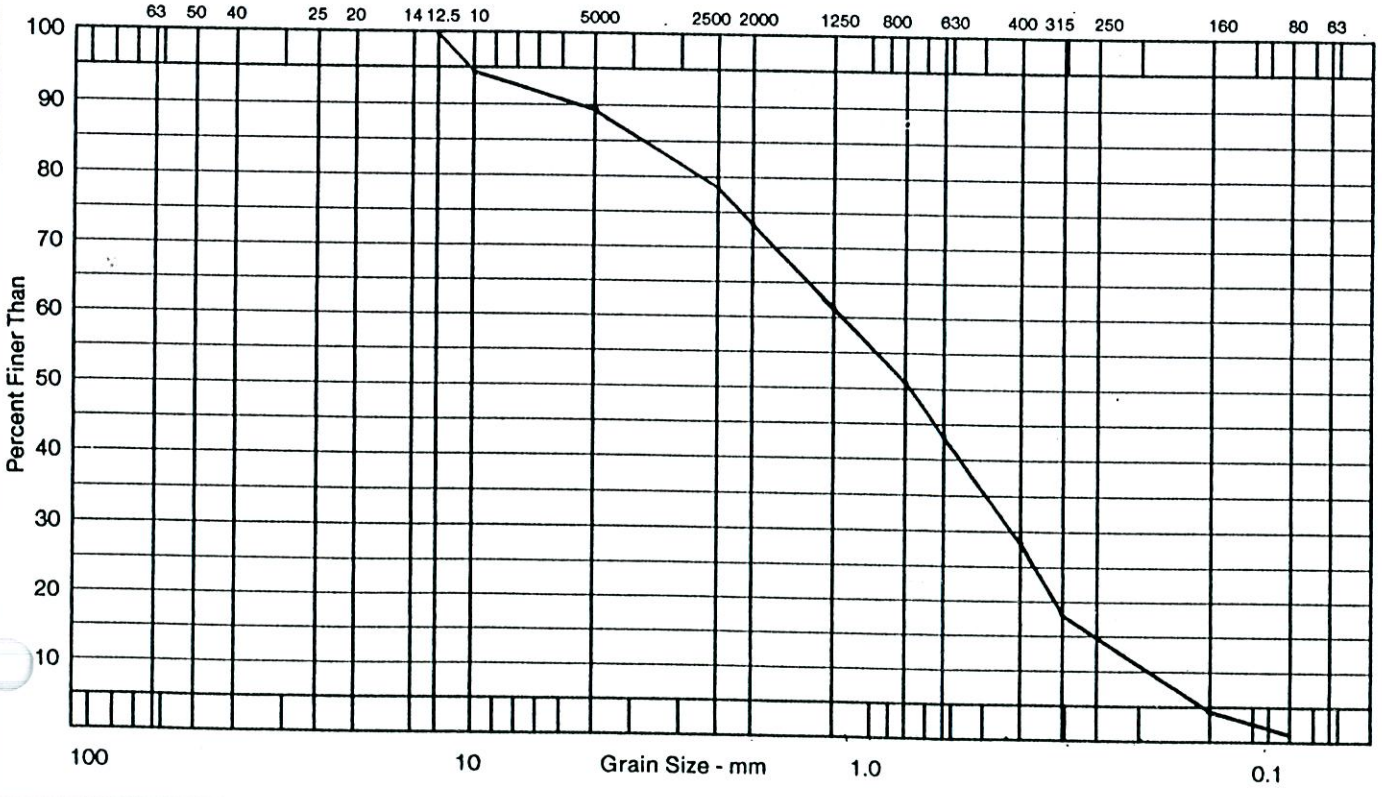
Client: SUNDANCE RECREATIONS
Project: PROPOSED ACREAGE SUBDIVISION
Made by: GB Job No.: 2949-1
Ck'd by: AL Date: May/June, 1995

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					100
10,000	10.0					95
5,000	5.0					90
2,500	2.5					78
2,000	2.0					73
1,250	1.25					62
800	0.800					51
630	0.630					43
400	0.400					28
315	0.315					18
160	0.160					4.3
80	0.080					1.8

Description of Sample
Sand, trace of gravel (SP)

Time of Sieving _____ Min. _____

Method of Preparation _____ Dry _____ Washed X
Remarks
Cu = 6.3
Cc = 0.8



Schedule "A" M.D. 94 Bylaw No. 27.95

J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

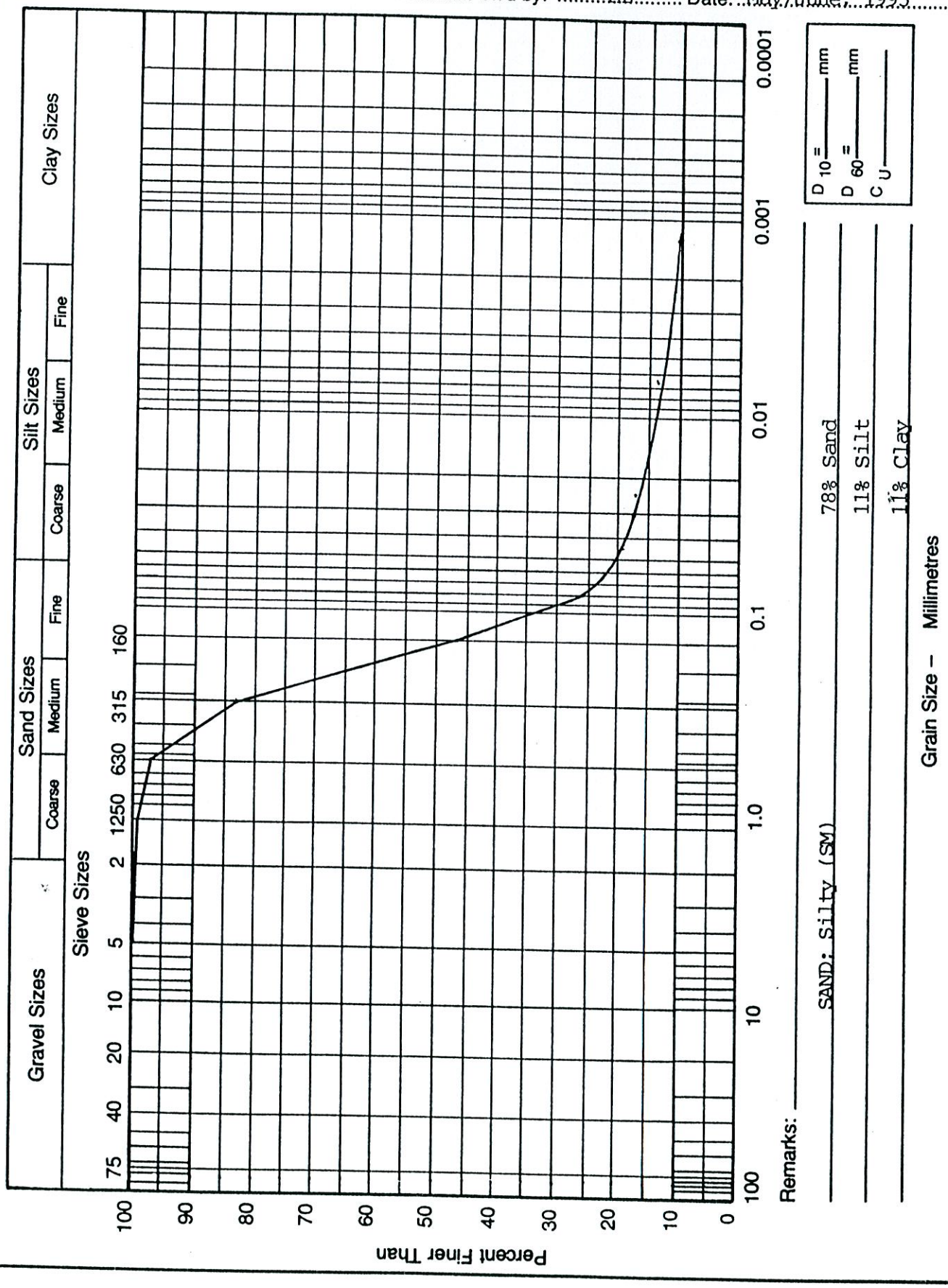
IN SIZE CURVE

Client: SUNDANCE RECREATIONS

Sample: ..... Depth: 0.6m ..... Project: PROPOSED ACREAGE SUBDIVISION

Location: Testhole 95-3 ..... Made by: GB Job No. 2949-1

Ck'd by: AL Date: May/June, 1995



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: _____ Depth: 1.2m
Location: Testhole 95-4

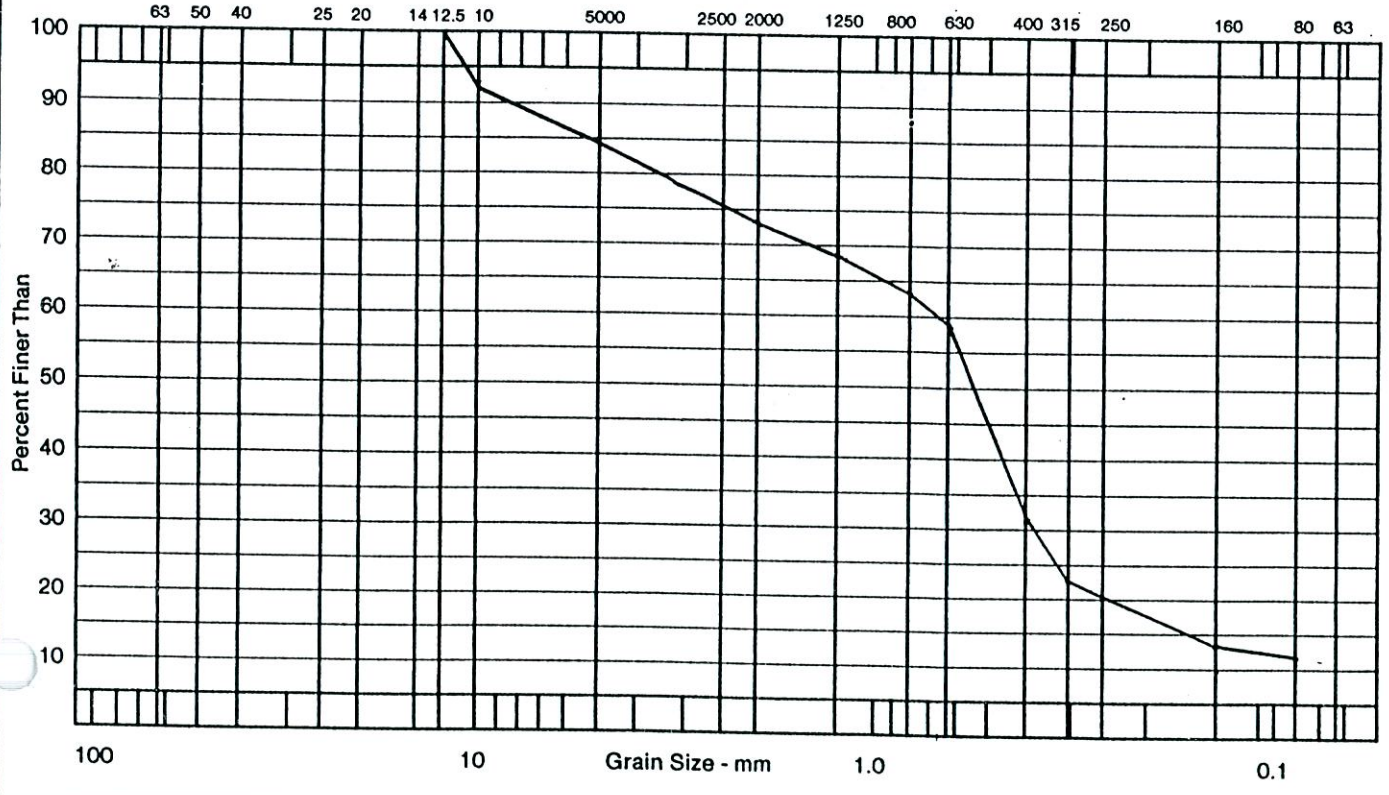
Client: SUNDANCE RECREATIONS
Project: PROPOSED ACREAGE SUBDIVISION
Made by: GB Job No.: 2949-1
Ck'd by: AL Date: May/June, 1995

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					100
10,000	10.0					92
5,000	5.0					85
2,500	2.5					76
2,000	2.0					73
1,250	1.25					68
800	0.800					63
630	0.630					59
400	0.400					31
315	0.315					22
160	0.160					13.5
80	0.080					11.7

Description of Sample
SAND: some gravel, trace of silt (SP-SM)

Time of Sieving _____ Min. _____

Method of Preparation _____ Dry _____ Washed x
Remarks
Cu = 13.6
Cc = 4.2



Schedule "A" M.D. 94 Bylaw No. 27.95

J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

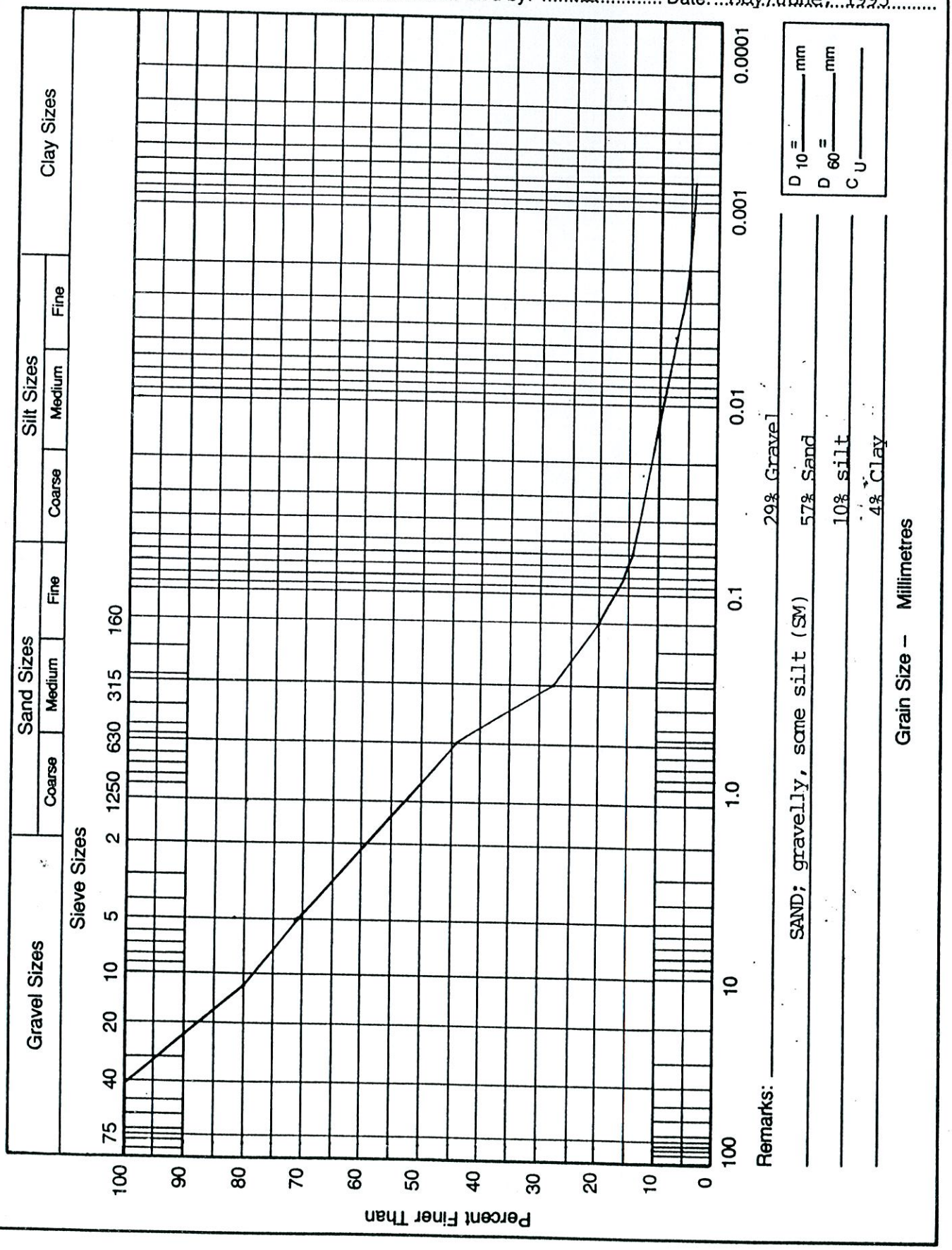
GRAIN SIZE CURVE

Client: SUNDANCE RECREATIONS

Sample: ..... Depth: 0.6m Project: PROPOSED ACREAGE SUBDIVISION

Location: Testhole 95-5 Made by: GB Job No. 2949-1

Ck'd by: AI Date: May/June, 1995

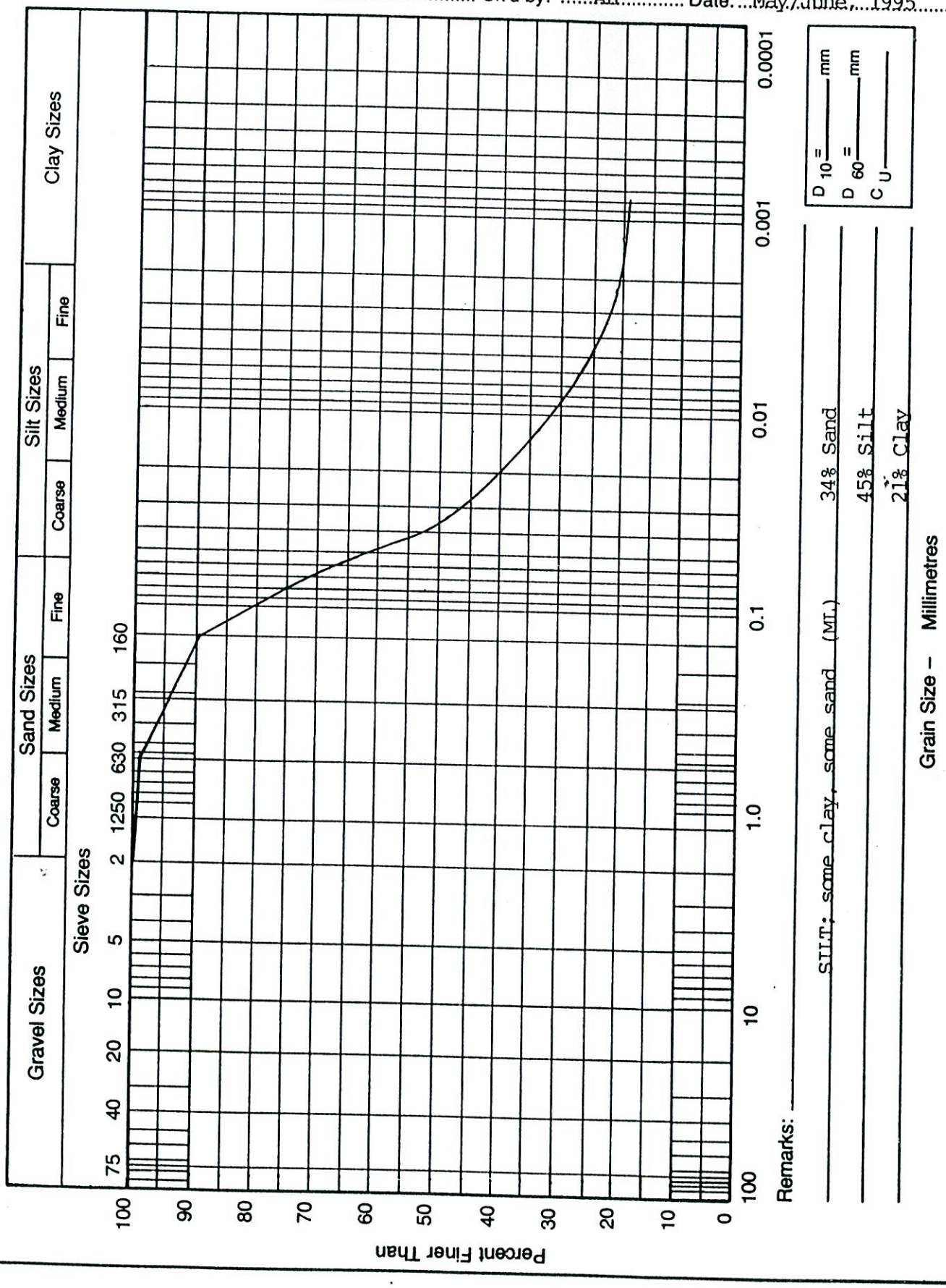


J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

GRAIN SIZE CURVE

Client: ...SUNDANCE RECREATIONS.....
Project: PROPOSED ACREAGE SUBDIVISION.....
Made by: ....GB..... Job No. 2949-1.....
Ck'd by: .....AL..... Date: ...May/June,...1995.....

Sample: ..... Depth: .....0.6m.....
Location: .....Testhole 95-6.....
.....

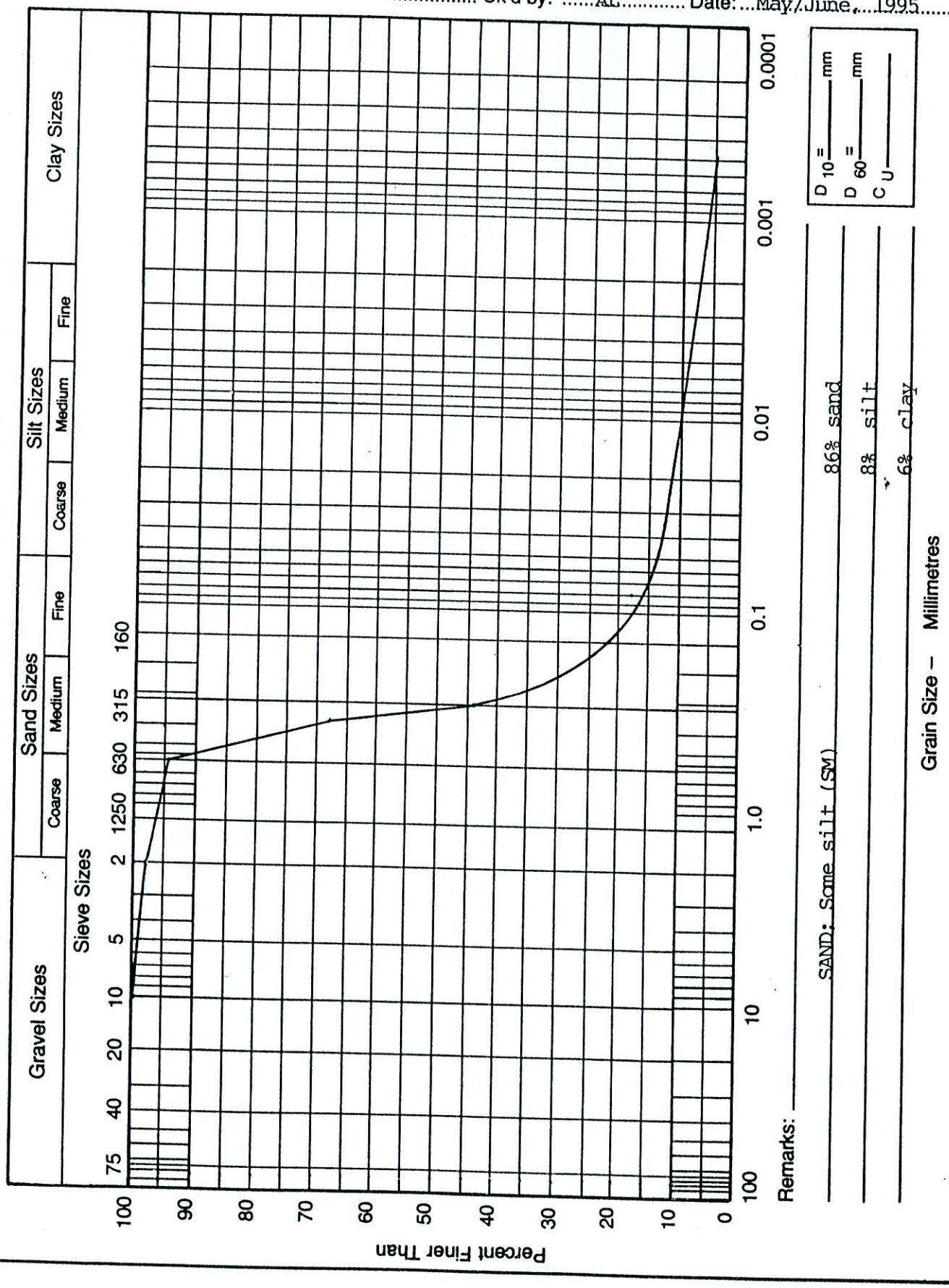


J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

GRAIN SIZE CURVE

Sample: ..... Depth: ....0.6m.....
Location: .....Testhole 95-7.....
.....

Client: .....SUNDANCE RECREATIONS.....
Project: .....PROPOSED ACREAGE SUBDIVISION.....
Made by: ....GR..... Job No.....2949-1.....
Ck'd by: .....AL..... Date:...May/June,...1995.....

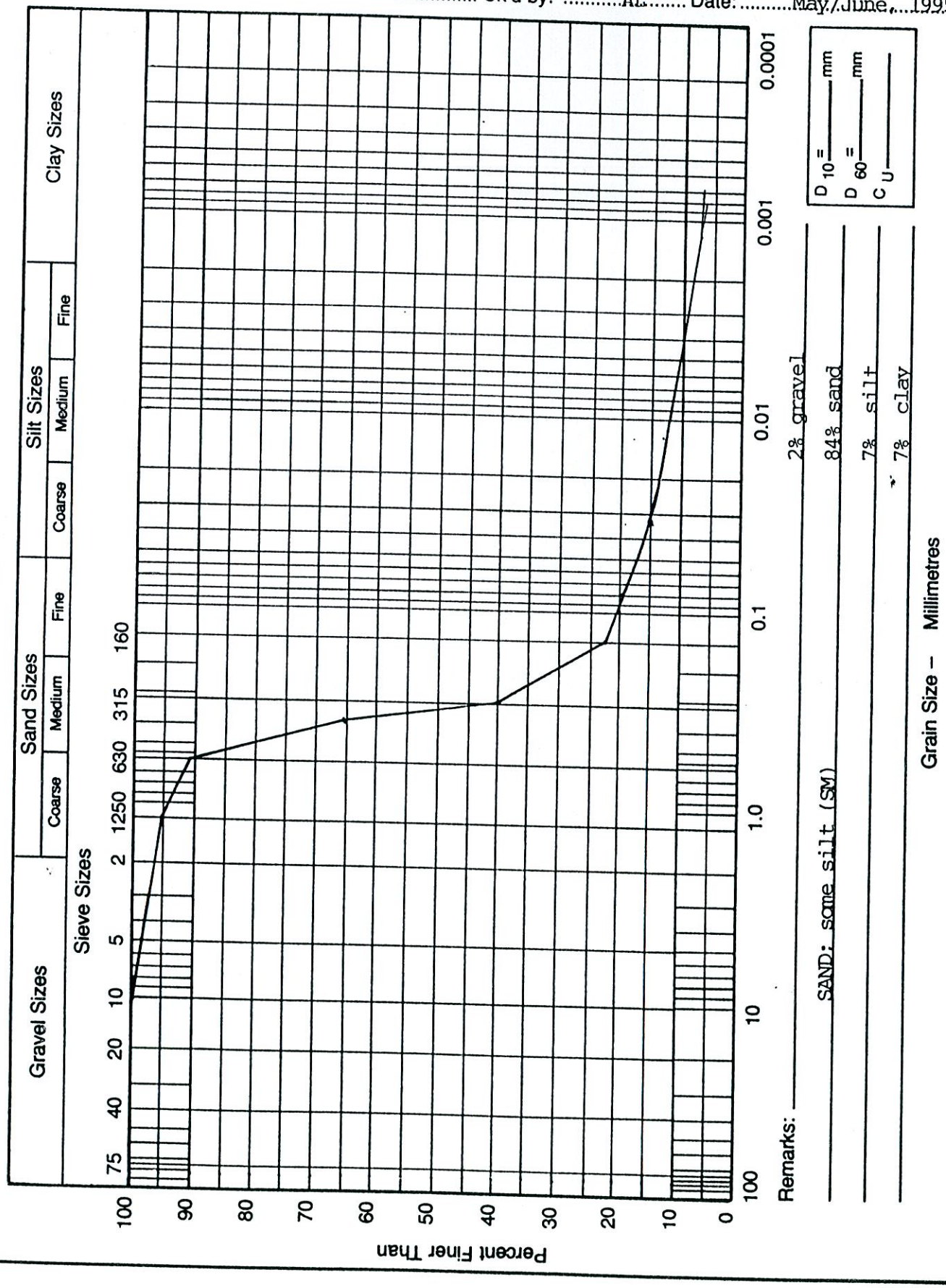


J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

GRAIN SIZE CURVE

Sample: ..... Depth: .....0.6m.....
Location: .....Testhole 95-10.....
.....

Client: .....SUNDANCE RECREATIONS.....
Project: ...PROPOSED ACREAGE SUBDIVISION.....
Made by: .....GB..... Job No. .....2949-1.....
Ck'd by: .....AL..... Date: .....May/June, 1995..



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: _____ Depth: 1.8m
Location: Testhole 95-10

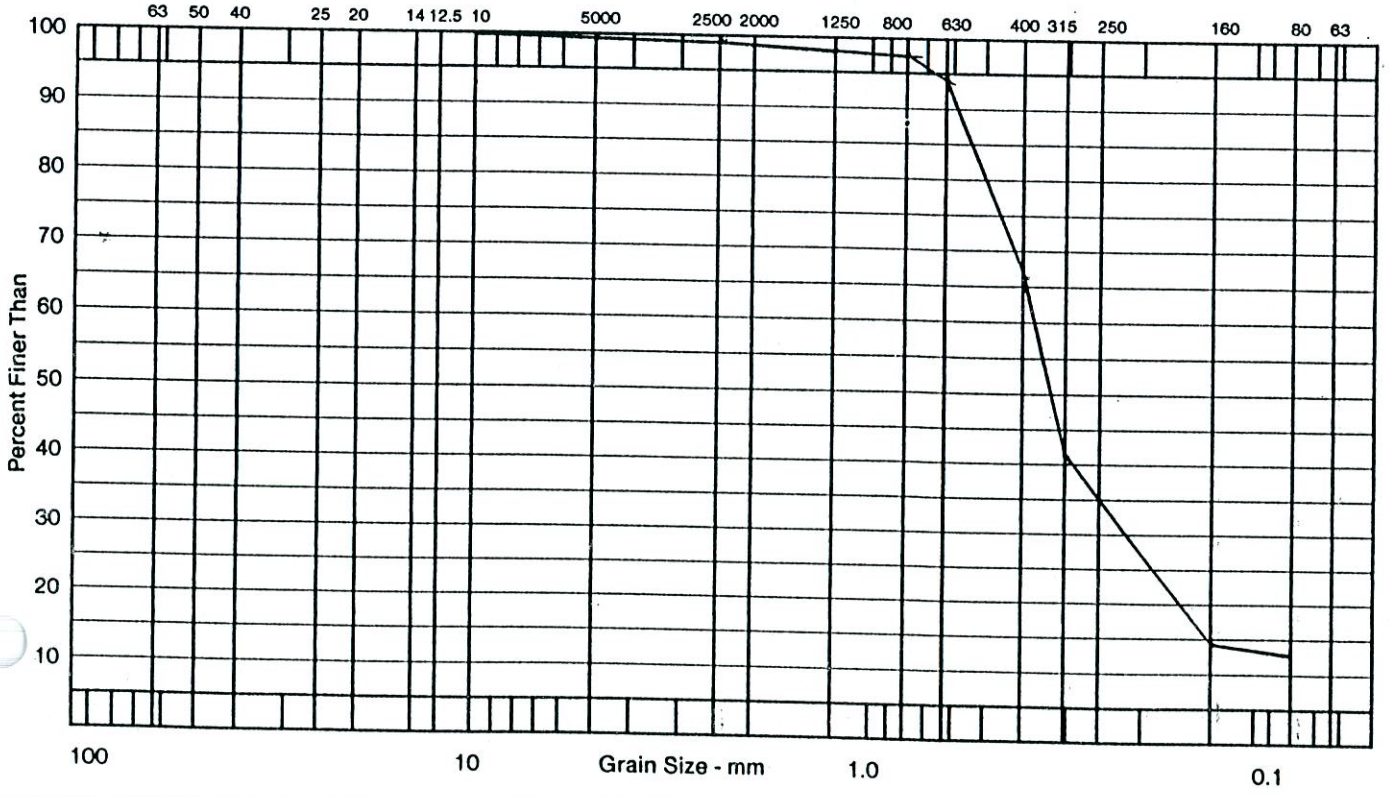
Client: SUNDANCE RECREATIONS
Project: PROPOSED ACREAGE SUBDIVISION
Made by: GB Job No.: 2949-1
Ck'd by: AL Date: May/June, 1995

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					
10,000	10.0					
5,000	5.0					
2,500	2.5					99.7
2,000	2.0					99
1,250	1.25					99
800	0.800					98
630	0.630					97
400	0.400					94
315	0.315					66
160	0.160					41
80	0.080					15
						13.0

Description of Sample
SAND; silty (SM)

Time of Sieving _____ Min. _____

Method of Preparation _____ Dry _____ Washed x
Remarks



PERCOLATION TEST RESULTS

Sundance Recreations

May, 1995

TESTHOLE No. 95-1				
Time	Depth to Water (cm)	Elapsed Time (min.)	Drop of Water (cm)	Percolation Rate (min/2.5cm)
15:14	45			
		68	> 40	< 0.7
17:22	dry @ 85			
		n/a	n/a	n/a
n/a	n/a			
		n/a	n/a	n/a
n/a	n/a			
		n/a	n/a	n/a
n/a	n/a			

TESTHOLE No. 95-2				
Time	Depth to Water (cm)	Elapsed Time (min.)	Drop of Water (cm)	Percolation Rate (min/2.5cm)
3:07	45			
		78	28	1.1
4:25	73			
		n/a	n/a	n/a
n/a	dry			
		n/a	n/a	n/a
n/a	n/a			
		n/a	n/a	n/a
n/a	n/a			**avg. = 1.1**

TESTHOLE No. 95-3				
Time	Depth to Water (cm)	Elapsed Time (min.)	Drop of Water (cm)	Percolation Rate (min/2.5cm)
15:45	40			
		43	19	0.9
16:28	59			
		22	5	1.8
16:50	64			
		n/a	n/a	n/a
17:30	Dry @ 70			
		n/a	n/a	n/a
n/a	n/a			**avg. = 1.4**

TESTHOLE No. 95-4				
Time	Depth to Water (cm)	Elapsed Time (min.)	Drop of Water (cm)	Percolation Rate (min/2.5cm)
15:36	40			
		53	> 36	< 0.6
16:29	Dry @ 76			
		n/a	n/a	n/a
n/a	n/a			
		n/a	n/a	n/a
n/a	n/a			
		n/a	n/a	n/a
n/a	n/a			

Schedule "A"

M.D. 94

Bylaw No. 27.95

Bylaw No. 27.95

M.D. 94

Schedule "A"

PERCOLATION TEST RESULTS

Sundance Recreations

May, 1995

TESTHOLE No. 95-5				
Time	**Depth to Water (cm)**	**Elapsed Time (min.)**	**Drop of Water (cm)**	**Percolation Rate (min/2.5cm)**
15:30	36			
		60	10	2.4
16:30	46			
		23	4	2.3
16:53	50			
		39	8	2.0
17:32	58			
		n/a	n/a	n/a
n/a	n/a			avg. = 2.2

TESTHOLE No. 95-6				
Time	**Depth to Water (cm)**	**Elapsed Time (min.)**	**Drop of Water (cm)**	**Percolation Rate (min/2.5cm)**
15:20	39			
		53	4	5.3
16:13	43			
		63	2	12.6
17:16	45			
		38	1	15.2
17:54	46			
		33	1	13.2
18:27	47			avg. = 26.6

TESTHOLE No. 95-7				
Time	**Depth to Water (cm)**	**Elapsed Time (min.)**	**Drop of Water (cm)**	**Percolation Rate (min/2.5cm)**
15:03	46			
		76	9	3.4
16:19	55			
		26	2	5.0
16:45	57			
		23	6.5	1.4
17:08	63.5			
		n/a	n/a	n/a
17:22	Dry			avg. = 3.3

TESTHOLE No. 95-8				
Time	**Depth to Water (cm)**	**Elapsed Time (min.)**	**Drop of Water (cm)**	**Percolation Rate (min/2.5cm)**
16:03	44			
		38	17	0.9
16:41	61			
		21	4	2.1
17:02	65			
		40	9	1.8
17:42	74			
		n/a	n/a	n/a
n/a	n/a			avg. = 1.6

PERCOLATION TEST RESULTS
Sundance Recreations
May, 1995

TESTHOLE No. 95-9				
Time	**Depth to Water (cm)**	**Elapsed Time (min.)**	**Drop of Water (cm)**	**Percolation Rate (min/2.5cm)**
15:50	41			
		44	17	1.0
16:34	58			
		61	> 17	< 1.4
17:35	Dry @ 75			
		n/a	n/a	n/a
n/a	n/a			
		n/a	n/a	n/a
n/a	n/a			**avg. = 1.0**

TESTHOLE No. 95-10				
Time	**Depth to Water (cm)**	**Elapsed Time (min.)**	**Drop of Water (cm)**	**Percolation Rate (min/2.5cm)**
15:58	35			
		39	15	1.0
16:37	50			
		23	6	1.5
17:00	56			
		39	> 9	< 1.7
17:39	Dry @ 65			
		n/a	n/a	n/a
n/a	n/a			**avg. = 1.3**

Schedule "A" M.D. 94 Bylaw No. 27.95