

PRELIMINARY
BASIC ENVIRONMENTAL DATA

LITTLE SMITH CREEK
BRIDGE

REFERENCE MILE 533 MACKENZIE HIGHWAY

DEPARTMENT OF PUBLIC WORKS
EDMONTON, CANADA



January , 1973



F. F. SLANEY & COMPANY LIMITED
Vancouver, Canada

B-29021

PRELIMINARY

**BASIC ENVIRONMENTAL DATA
LITTLE SMITH CREEK BRIDGE
REFERENCE MILE 533**

**MACKENZIE HIGHWAY
NORTHWEST TERRITORIES**

**DEPARTMENT OF PUBLIC WORKS
EDMONTON, CANADA**

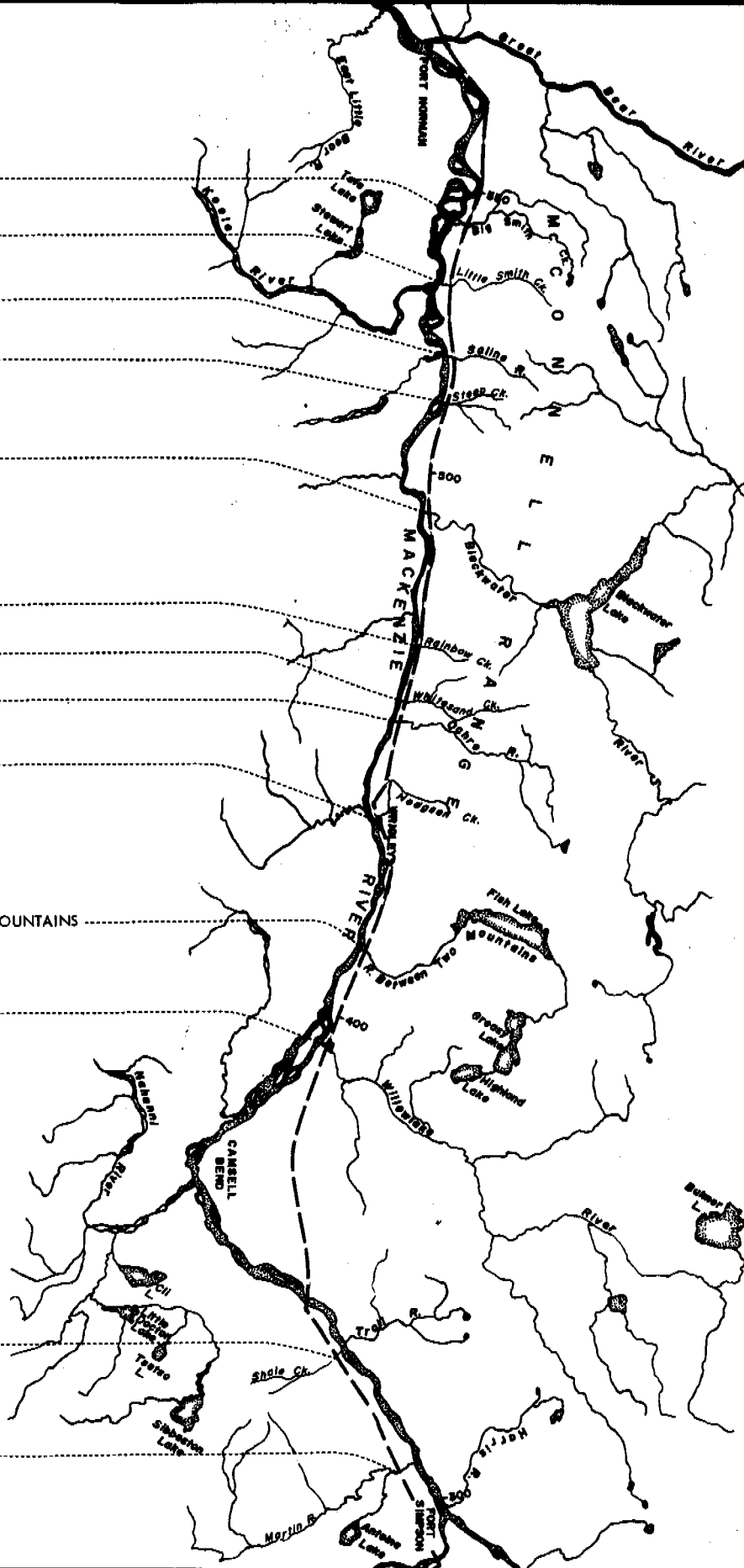
JANUARY 1973

**F.F. SLANEY & COMPANY LIMITED
VANCOUVER, CANADA**

BRIDGE SITES

KEY MAP
BRIDGES
MACKENZIE HIGHWAY
MILE 300 TO 550

BIG SMITH CREEK
LITTLE SMITH CREEK
SALINE RIVER
STEEP CREEK
BLACKWATER RIVER
RAINBOW CREEK
WHITESAND CREEK
OCHRE RIVER
HODGSON CREEK
RIVER BETWEEN TWO MOUNTAINS
WILLOWLAKE RIVER
SHALE CREEK
MARTIN RIVER



SCALE
0 10 20
MILES

MACKENZIE HIGHWAY
LITTLE SMITH CREEK BRIDGE
REFERENCE MILE 533

RIPRAP REQUIRED



PART 1

BASIC ENVIRONMENTAL DATA

1.1 SURFICIAL GEOLOGY

The bridge site is flanked by low abandoned alluvial terraces which are subject to abnormal flood and a high rate of active fluvial erosion on both sides of straight channel. A cut on the north side may be susceptible to mass movement and thermal erosion.

Surface drainage at the base of fill on the south side requires control to prevent siltation of the creek.

1.2 SOILS

Soils along the approaches to the Little Smith Creek bridge are highly erodible peaty gleysols. Special attention to drainage and revegetation of these soils will be required.

1.3 VEGETATION

The basic forest types at the Little Smith Creek bridge site are 50-foot tall black spruce with larch on the upper slopes, with occasional white spruce along the river bank.

1.4 WILDLIFE

Basic disturbance to wildlife would be disruption of normal passage along the river, caused by the extensive approach fill and the proposed berm.

1.5 FISH

The proposed bridge and approach fills will reduce the cross section area of the stream bed, and the proposed spur dyke will channel water at high water level, which will create higher stream velocity under the bridge. The effects of these stream diversions should be assessed. Stream velocities during the spring thaw are the primary concerns. Siltation from runoff over unstable soils should be closely controlled.

No specific information has been collected regarding fish or invertebrate populations in Little Smith Creek. It appears to be suitable habitat, however, for several species, which probably use it for spawning and rearing during the spring and summer months.

1.6 ARCHAEOLOGY

The chance of an archaeological find in this area is only a moderate possibility. Surveillance during initial construction is required.

1.7 LANDSCAPE - RECREATION

The unstable soil conditions and the lack of items of particular interest at this crossing site preclude the chance of recreational development. Motorists should not be encouraged to stop at this crossing site.

1.8 AESTHETICS

The simple pier bridge would be the more attractive structure.

1.9 SOCIO-ECONOMIC

No particular socio-economic impact is foreseeable.

1.10 CONSTRUCTION

The unstable soils are a major concern and the construction crews should be housed well away from the site. Materials should be kept within the right-of-way to avoid further disturbance to the vegetation and soil.

Winter operations for all phases of construction are recommended.

PART 2

ASSESSMENT

The primary area of concern is the maintenance of soil stability to avoid unnecessary movement of silts into the stream channel.

**Stream velocities should be calculated for the proposed structure.
Two span structure is preferable to minimize disturbance of stream bed.**

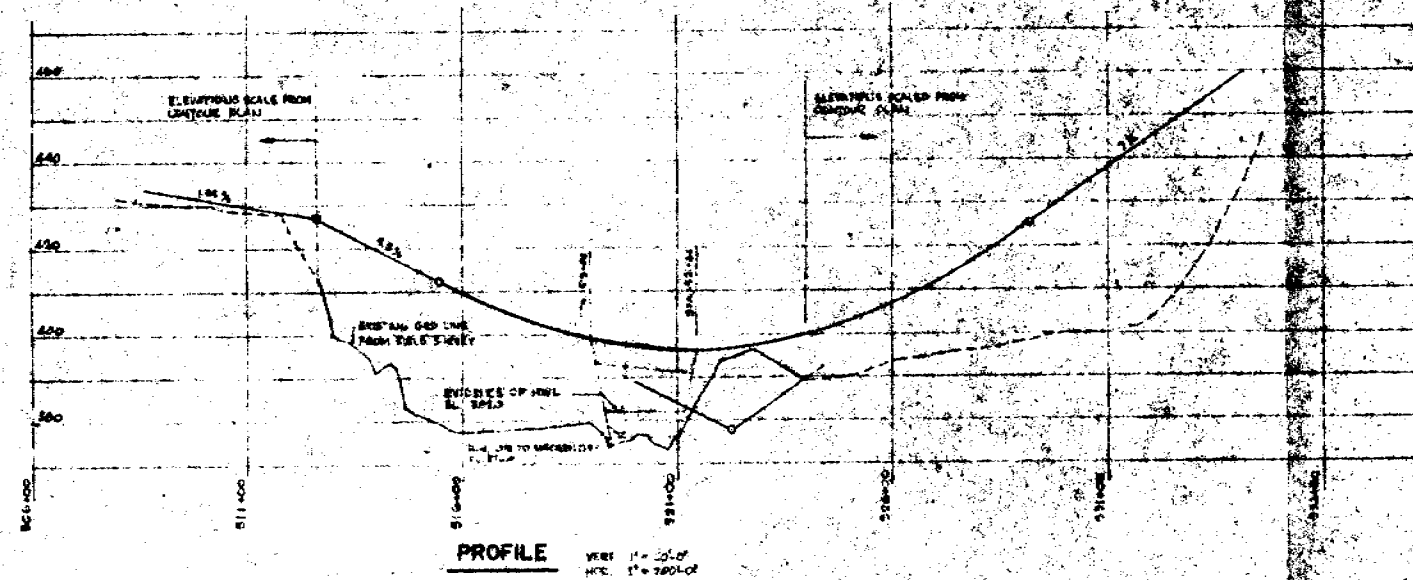
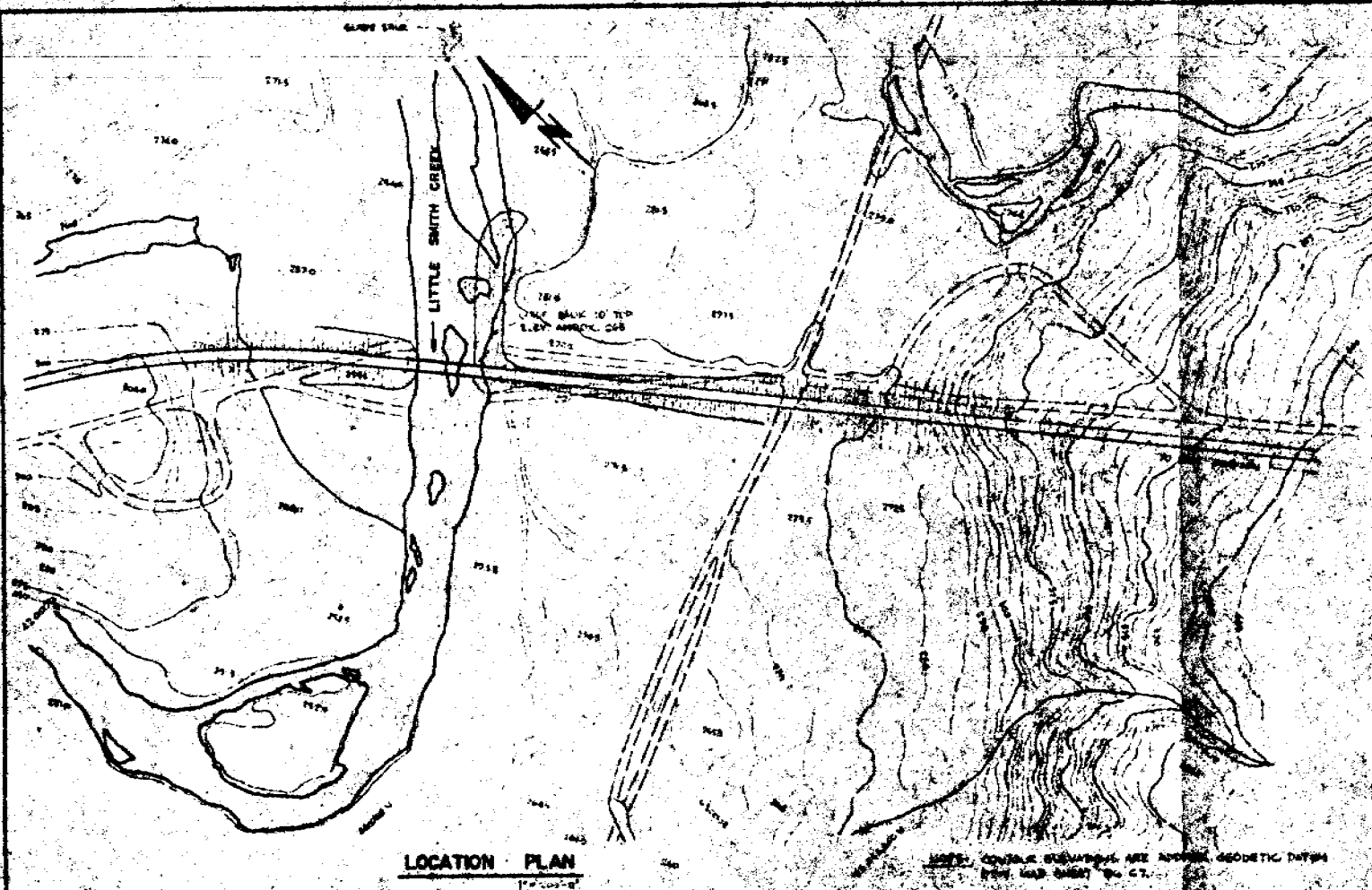


29.10.72. Little Smith Creek looking south. This approach crosses a steep glaciofluvial terrace. Stream banks appear to be easily erodible. Two span bridge more suitable for free passage of debris.



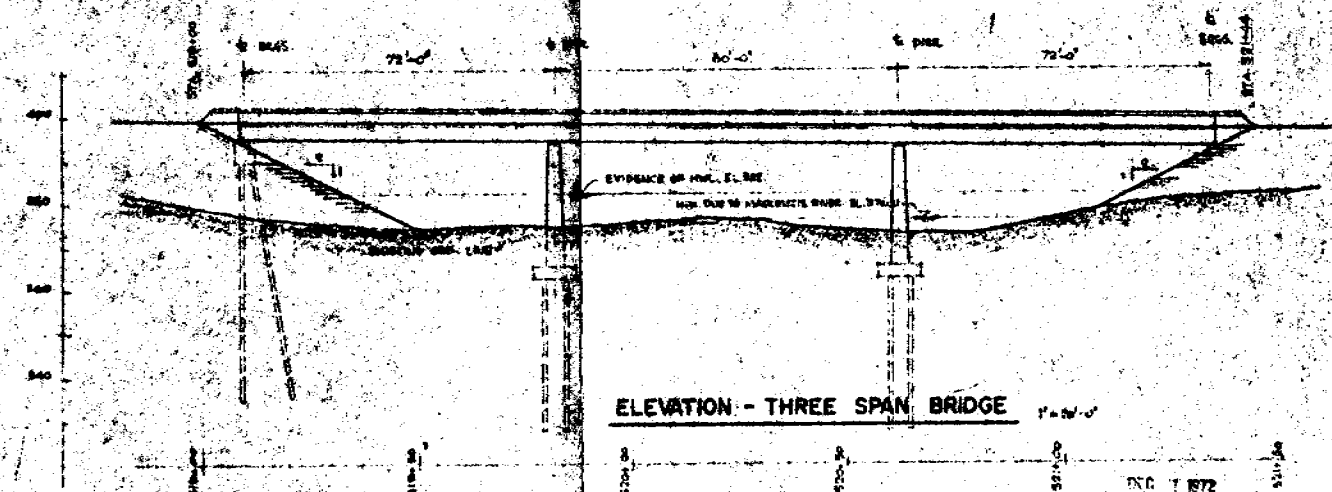
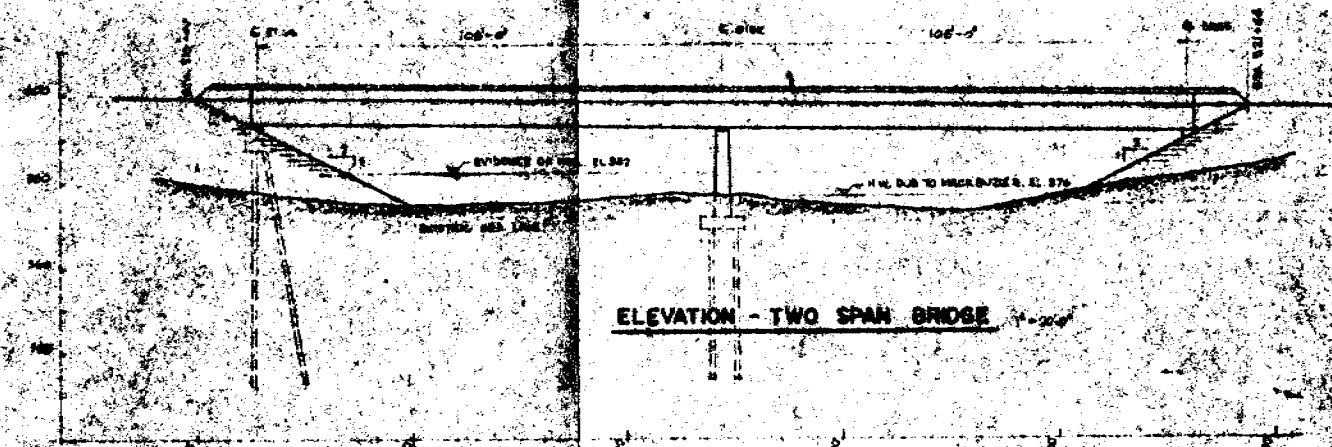
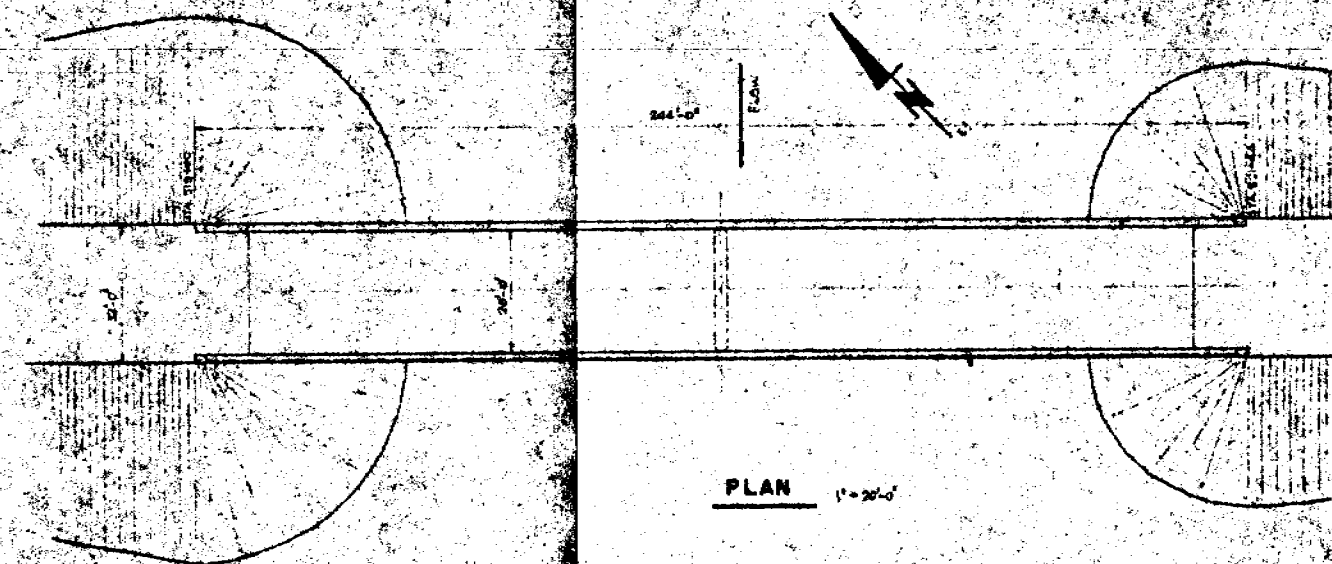
29.10.72. Little Smith Creek looking north. Low banks of abandoned alluvial terrace subject to minor small scale slumps. Erosion about equal on each side of straight channel.





GENERAL NOTES:

1. LOCATION OF CROSSING & BASIC DESIGN DATA AS PER BOLTER BATHY TRIMBLE 888 AND 115-1172
2. DESIGN STANDARDS:
 - a) LOADING:
 - DEAD LOAD: INCLUDES 80% OF FUTURE WEARING SURFACE
 - LIVE LOAD: 1. CSA H15-520 LOADING PLUS IMPACT
 - 2. SINGLE CBA H40-532 TRUCK APPLIED IN CENTER OF ROADWAY ALLOWING 25% OVERSTRESS AND NO IMPACT
 - b) CODES AND SPECIFICATIONS:
 - CNA 36-1966 HIGHWAY BRIDGE SPECIFICATION
 - AASHTO 1963 HIGHWAY BRIDGE SPECIFICATION 1930.71.73 INTERIM SPECIFICATIONS



		Stanley Associates Engineering Ltd. CONSULTING ENGINEERS	
CANADA DEPARTMENT OF PUBLIC WORKS WESTERN REGION		MACKENZIE HIGHWAY LITTLE SMITH CREEK - MILE 333	
PROPOSED BRIDGE CROSSING		DRAWING NO. 550-7-1-P4	