# PRELIMINARY

# BASIC ENVIRONMENTAL DATA

# STEEP CREEK BRIDGE

## REFERENCE MILE 511 MACKENZIE HIGHWAY

DEPARTMENT OF PUBLIC WORKS

EDMONTON, CANADA



January , 1973



F. F. SLANEY & COMPANY LIMITED

Vancouver, Canada

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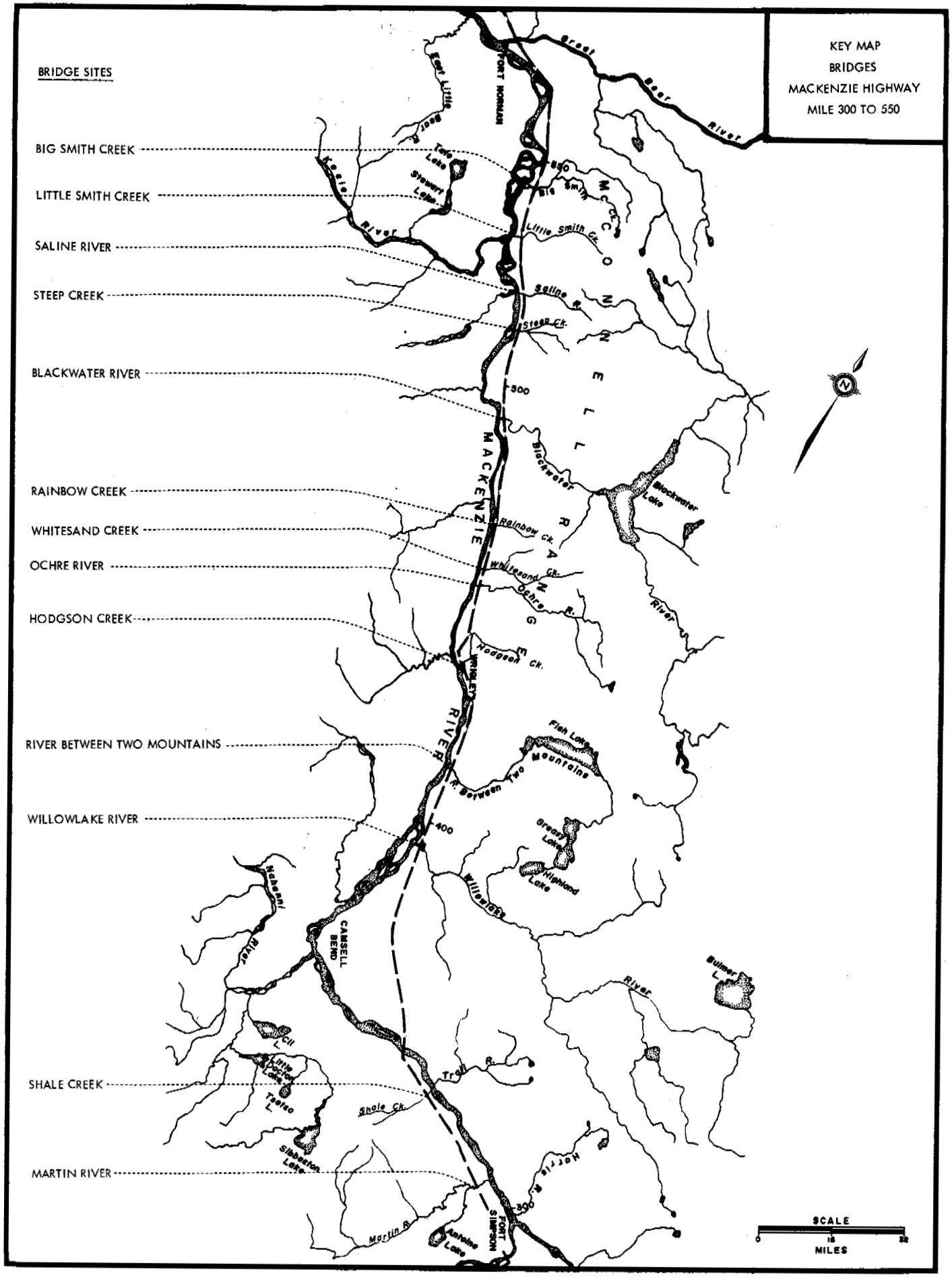
BASIC ENVIRONMENTAL DATA
STEEP CREEK BRIDGE
REFERENCE MILE 511

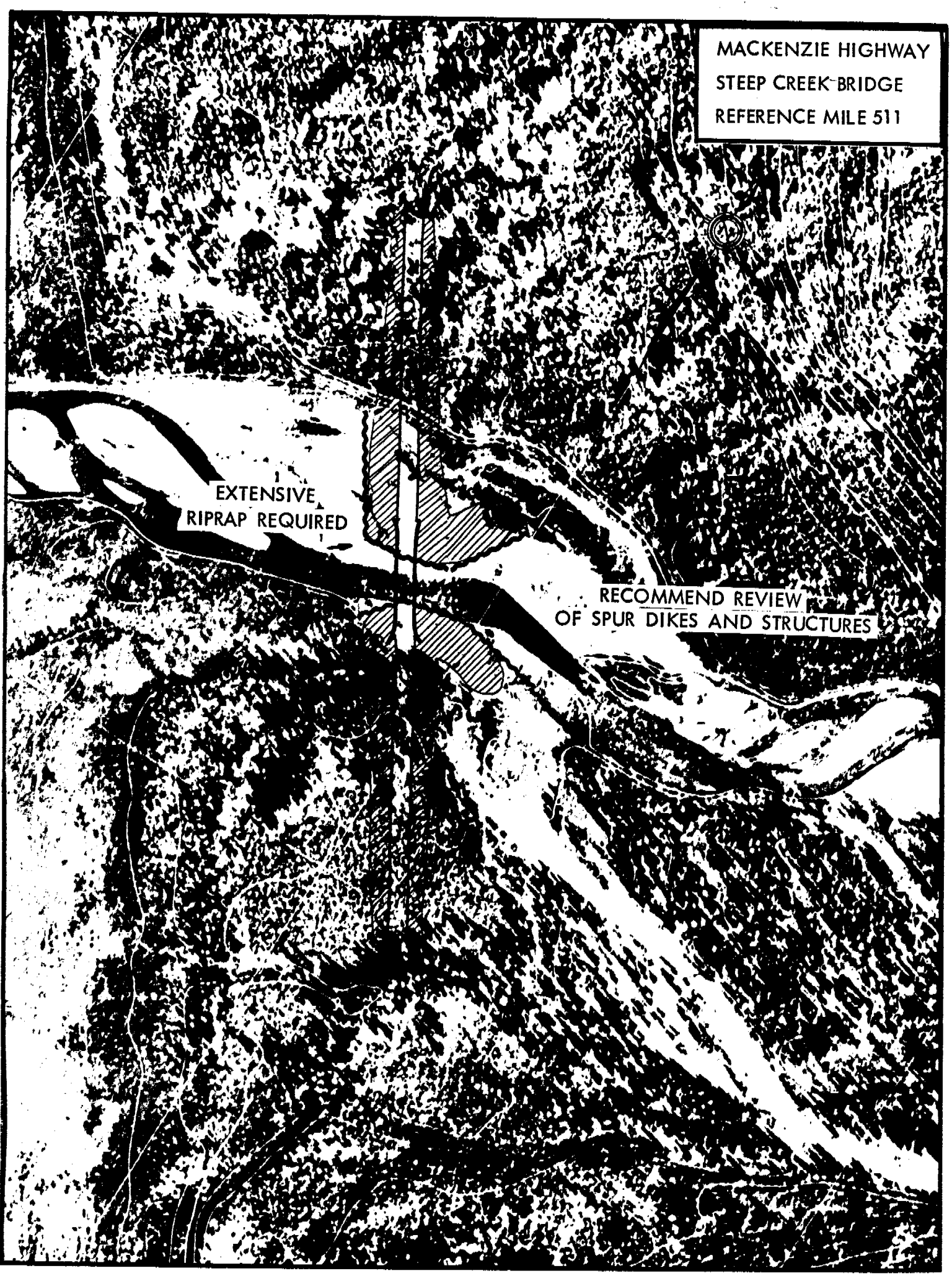
MACKENZIE HIGHWAY
NORTHWEST TERRITORIES

DEPARTMENT OF PUBLIC WORKS
EDMONTON, CANADA

JANUARY, 1973

F.F. SLANEY & COMPANY LIMITED
VANCOUVER, CANADA


KEY MAP
BRIDGES
MACKENZIE HIGHWAY
MILE 300 TO 550
BRIDGE SITES
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
MACKENZIE
MOUNTAINS
MACKENZIE HIGHWAY
FORT NORMAN
Great Bear River
Big Smith Ck.
Little Smith Ck.
Saline R.
Steep Ck.
Blackwater R.
Blackwater Lake
Rainbow Ck.
Whitesand Ck.
Ochre R.
Hodgson Ck.
WRIGLEY
Fish Lake
R. Between Two Mountains
Willowlake R.
Highland Lake
CAMSELL BEND
Nahanni River
Shale Ck.
Martin R.
Antoine Lake
FORT SIMPSON
Hoffle R.
Trout R.
Bulmer L.
Tsetso L.
Sibbeston Lake
300
350
400
450
500
550
SCALE
0
16
32
MILES


MACKENZIE HIGHWAY
STEEP CREEK BRIDGE
REFERENCE MILE 511
EXTENSIVE
RIPRAP REQUIRED
RECOMMEND REVIEW
OF SPUR DIKES AND STRUCTURES

# PART 1

## BASIC ENVIRONMENTAL DATA

### 1.1 SURFICIAL GEOLOGY

The bridge site is flanked by abandoned alluvial terraces which appear to have stable banks.

The stream channel has a braided character which indicates that the stream is highly active. Proposed spur dike may be ineffective for control of stream. Data is especially insufficient for this site; a detailed review is recommended.

### 1.2 SOILS

The long approach fills cause minimum soil disturbance. Plans to provide a mantle of soil on slopes of the fill to facilitate establishing plant growth should be considered.

### 1.3 VEGETATION

The forest cover comprises of aspen with spruce and larch. The wide fill proposed will necessitate a wide cut through the timber. Further disturbance should be minimized.

### 1.4 WILDLIFE

Normal movement of wildlife along the flood plain may be restricted by the extended fill. Adequate shoreline passage under the bridge should be incorporated into the fill design.

## 1.5 FISH

Approach fills encroach onto the stream bed from both sides of the creek. These conditions will lead to unnaturally high stream velocities at high water levels of Steep Creek.

The reduction in width of the stream bed will also increase the potential for ice and debris jams to form at the site, posing a further threat to fish movement.

No specific information is available on fish populations or aquatic communities of Steep Creek. It is assumed that the stream is used by several species between May and October.

## 1.6 ARCHAEOLOGY

Cabins are noted on both sides of the creek at the crossing. This area was possibly an access area to north end of Blackwater Lake and the Franklin Mountains.

The location has a high probability for further archaeological finds and should be investigated prior to further development.

## 1.7 LANDSCAPE - RECREATION

The large gravel bars of the river will attract visitors and some provision for parking and access to these sites should be incorporated in the approach design.

## 1.8 AESTHETICS

The large fills and protective dykes would be difficult to make attractive.

## 1.9 SOCIO-ECONOMIC

The bridge site has no particular socio-economic significance.

## 1.10 CONSTRUCTION

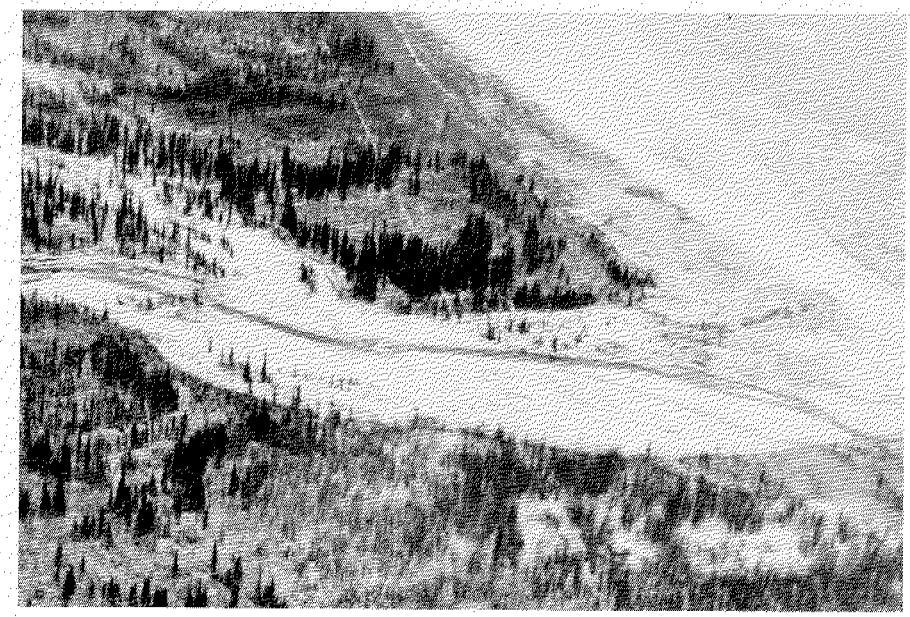
The construction camp should be located on the fill or cleared right-of-way to avoid unnecessary disturbance of the forest cover.

The pier construction and as much as possible the hauling of fill material should be scheduled for winter months.

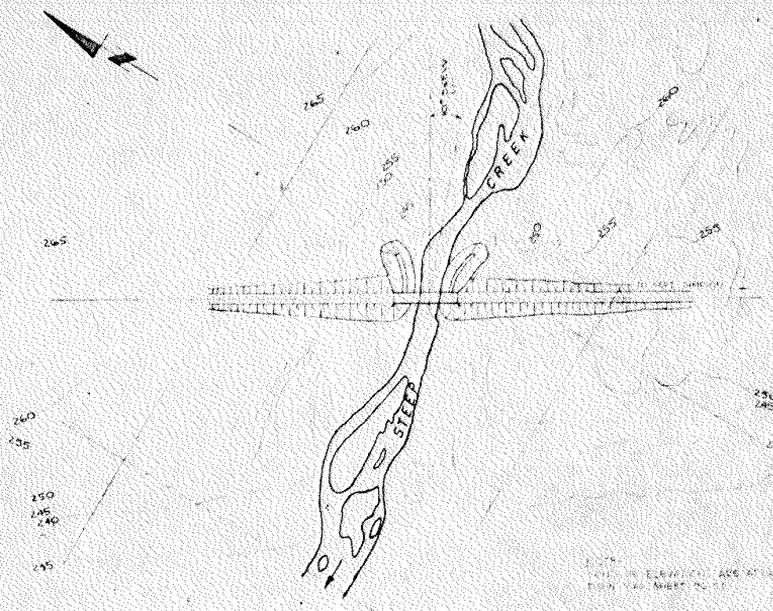
# PART 2

## ASSESSMENT

The active stream channel appears difficult to control. Barriers to fish may be created by restricting the river channel which would tend to increase water velocities and possibly trap ice flows.



26.10.72. Steep Creek. Note highway location outline. Adjacent materials well drained and stable at crossing site. Bridge plan recommends spur dikes upstream on both sides. Although fluvial and terrain data is insufficient for evaluation this kind of erosion prevention may not be required especially if two span bridge is utilized. Normal rip-rap will be required along stream bank in any case. Braided character of this stream and wide active alluvium indicates a highly active channel; spur dikes may be ineffective. Detailed review of this site is required. Crossing will have low impact on fish if passage assured. Archaeological Site No. 38. Old cabins are found on both creek banks. These should be excavated for artifacts that may be prehistoric, as well as historic origin.



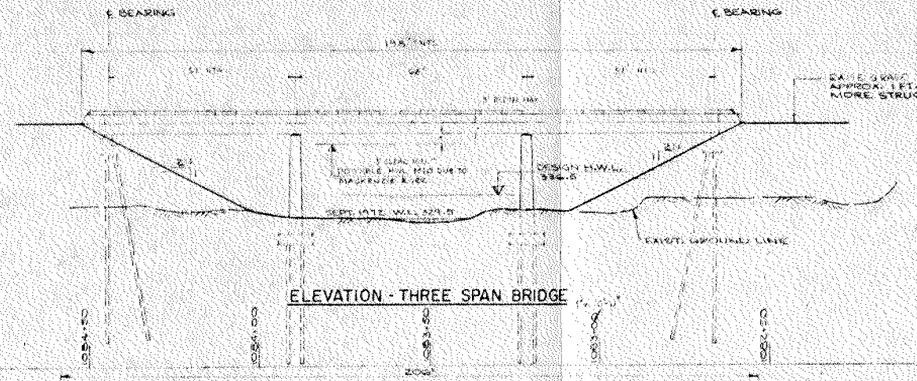

PLAN
1"=200'



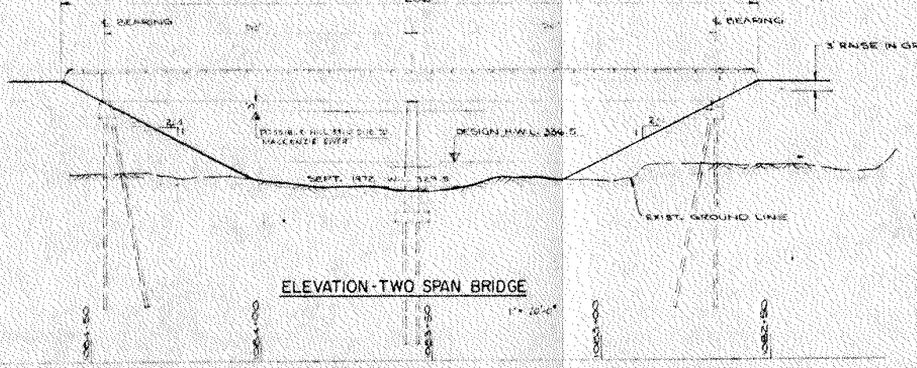

PROFILE
HORIZ. 1"=200'
VERT. 1"=20'

GENERAL NOTES:

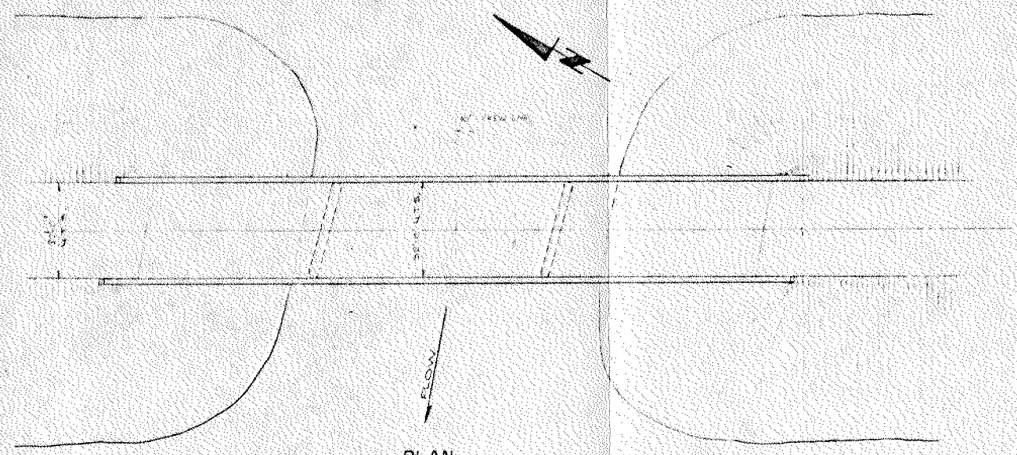
1. LOCATION OF CROSSING & BASIC DESIGN DATA AS PER SOLTER, DARISH, TRIMBLE DRAWING NO. 151-3-65 & 66.
2. DESIGN STANDARDS:
   (a) LOADING:
   DEAD LOAD - INCLUDES 30 PCF FOR FUTURE WEARING SURFACE
   LIVE LOAD - 1 CSA M75-1970 LOADING PLUS IMPACT
   - SINGLE CSA M75-1970 TRUCK APPLIED IN CENTER OF ROADWAY
   - ALLOWANCE 11'-0" CLEARANCE AND NO IMPACT
   (b) CODES AND SPECIFICATIONS:
   CSA S6-1966 HIGHWAY BRIDGE SPECIFICATION
   AASHO 1969 HIGHWAY BRIDGE SPECIFICATION, 1970, 71, 72 AASHO INTERIM SPECIFICATIONS




ELEVATION - THREE SPAN BRIDGE




ELEVATION - TWO SPAN BRIDGE




PLAN

DEC. 1 1972

*Stanley Associates Engineering Ltd.*
CONSULTING ENGINEERS

CANADA DEPARTMENT OF PUBLIC WORKS
WESTERN REGION

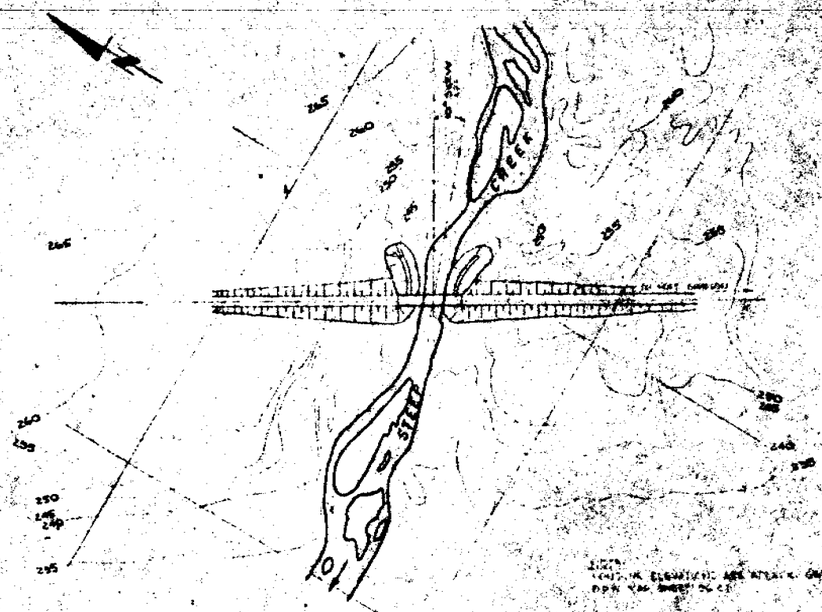
MACKENZIE HIGHWAY

STEEP CREEK — MILE 511

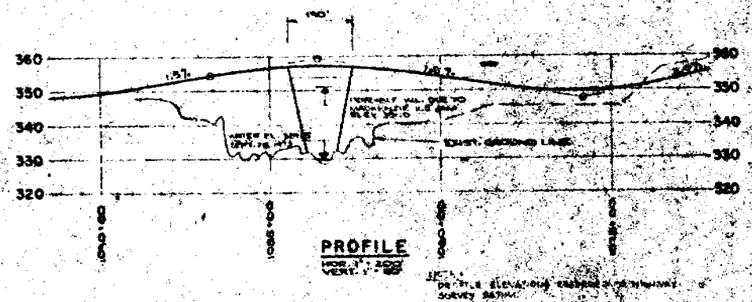
PROPOSED BRIDGE CROSSING

| NO. | DATE | DESCRIPTION | BY | APPROVED |
|---|---|---|---|---|
| | | REVISIONS | | |

DESIGNED BY D.G.E. | DRAWN BY J.E.S. & D.C. | CHECKED BY | DATE NOVEMBER 1972 | DRAWING NO. 650-7-1-P2
SCALE AS NOTED | JOB NO. 650-7-1-1 | SHEET NO. 2 OF 8



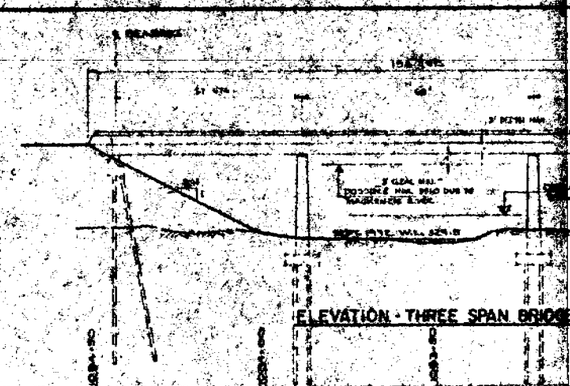

PLAN



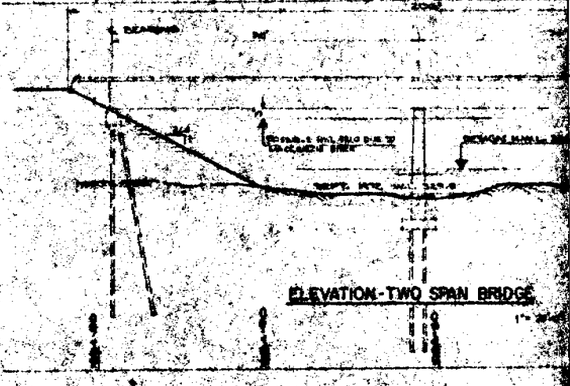

PROFILE

GENERAL NOTES:

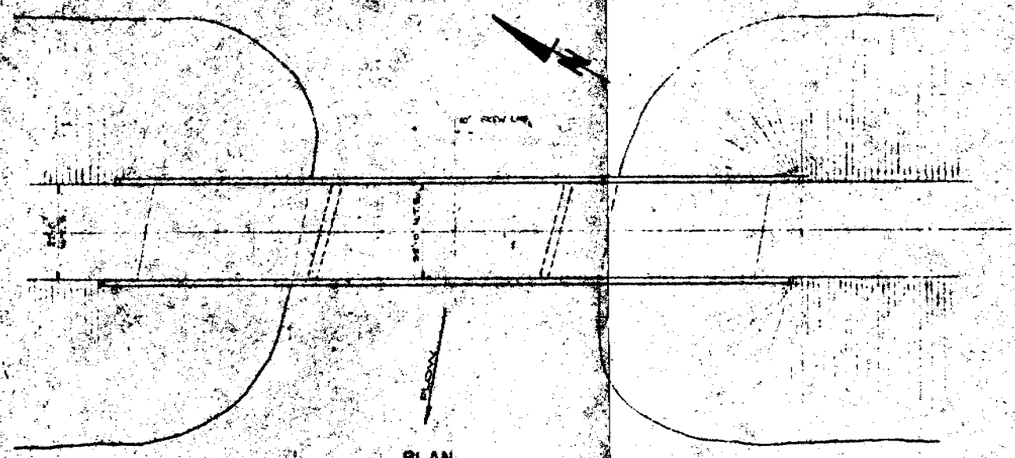
1. LOCATION OF CROSSING & BASIC DESIGN DATA AS PER BOLTER, DARBY TEMPLE, DRAWING NO. 65-3-46 & 65
2. DESIGN STANDARDS:-
   a). LOADING:
   DEAD LOAD: INCLUDES 30 PSF FOR FUTURE WEARING SURFACE
   LIVE LOAD: CSA H21-1969 LOADING PLUS IMPACT
   : SINGLE CSA H40-1970 TRUCK APPLIED IN CENTER OF ROADWAY
   ALLOWING 25% OVERSTRESS AND NO IMPACT
   b). CODES AND SPECIFICATIONS:
   CSA S6-1966 HIGHWAY BRIDGE SPECIFICATION
   AASHO 1969 HIGHWAY BRIDGE SPECIFICATION, 1970, 71, 72 AASHO INTERIM SPECIFICATIONS




ELEVATION - THREE SPAN BRIDGE




ELEVATION - TWO SPAN BRIDGE




PLAN

DEC 1 1972

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CONSULTING ENGINEERS

CANADA DEPARTMENT OF PUBLIC WORKS
WESTERN REGION

MACKENZIE HIGHWAY

STEEP CREEK — MILE 511

PROPOSED BRIDGE CROSSING

650-7-1