

PRELIMINARY  
BASIC ENVIRONMENTAL DATA

OCHRE RIVER  
BRIDGE

REFERENCE MILE 455 MACKENZIE HIGHWAY

DEPARTMENT OF PUBLIC WORKS  
EDMONTON, CANADA



January , 1973



F. F. SLANEY & COMPANY LIMITED  
Vancouver, Canada

# **PRELIMINARY**

**BASIC ENVIRONMENTAL DATA  
OCHRE RIVER BRIDGE  
REFERENCE MILE 455**

**MACKENZIE HIGHWAY  
NORTHWEST TERRITORIES**

**DEPARTMENT OF PUBLIC WORKS  
EDMONTON, CANADA**

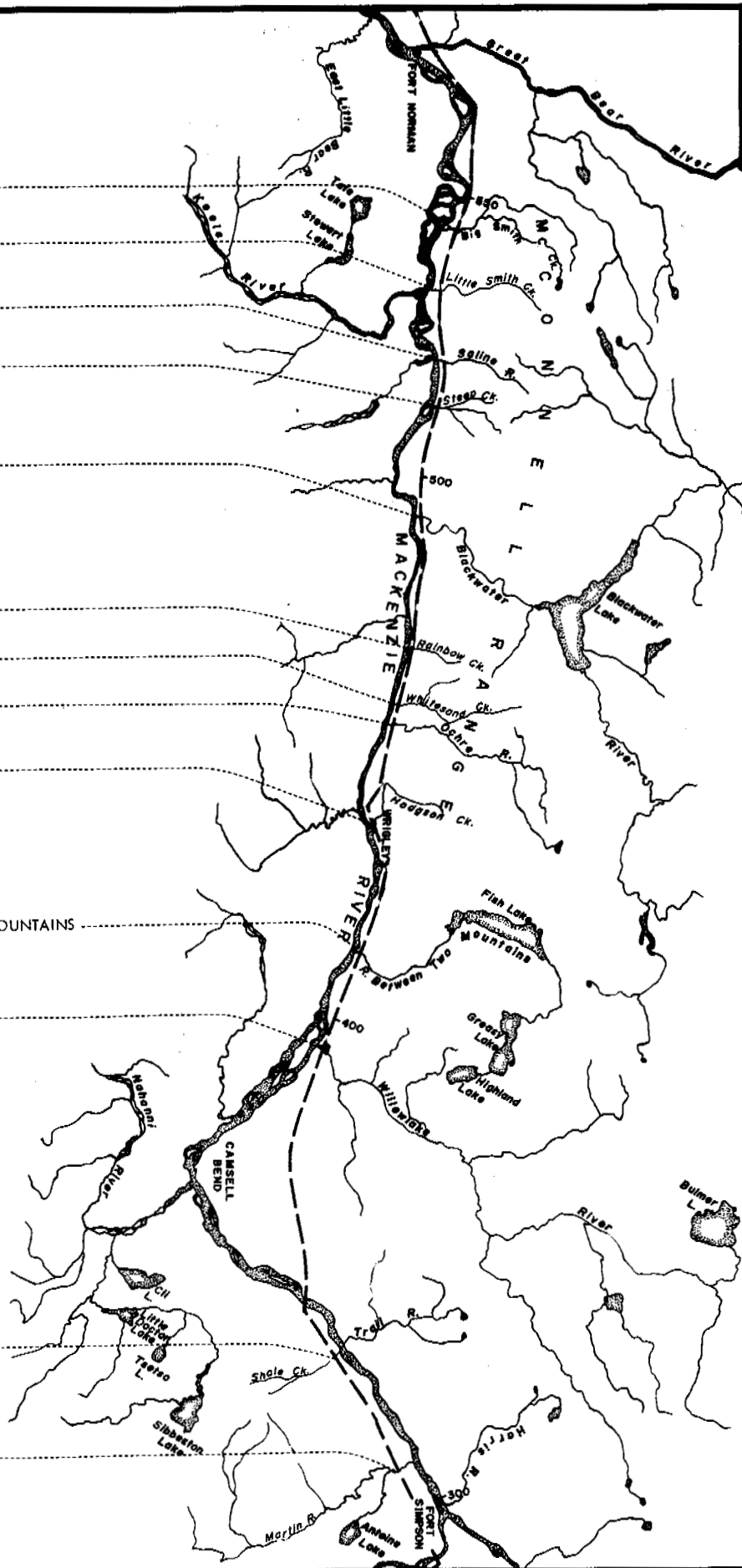
**JANUARY, 1973**

**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 .....

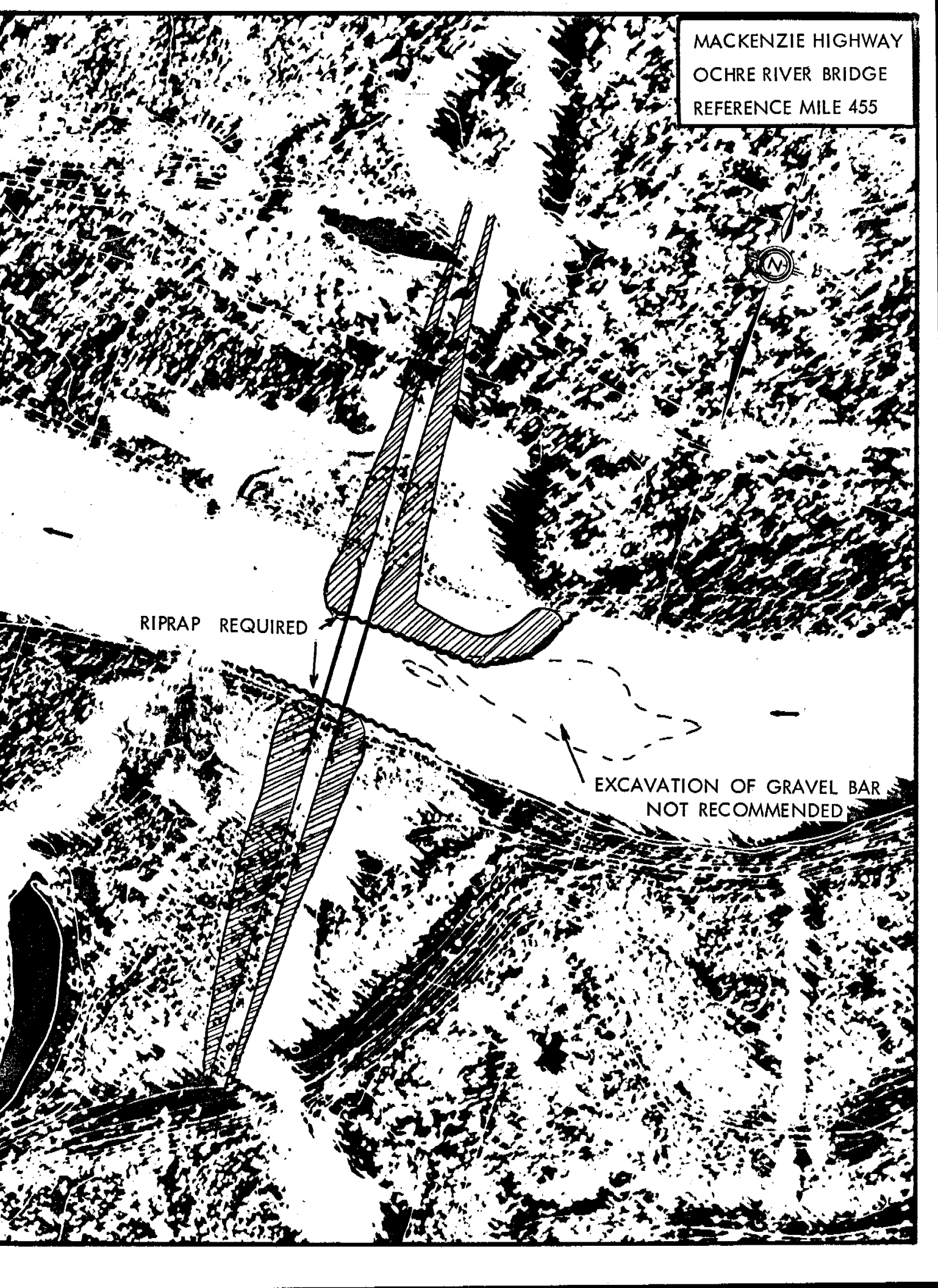


SCALE  
0 16 32  
MILES

MACKENZIE HIGHWAY  
OCHRE RIVER BRIDGE  
REFERENCE MILE 455

RIPRAP REQUIRED

EXCAVATION OF GRAVEL BAR  
NOT RECOMMENDED



## PART 1

### BASIC ENVIRONMENTAL DATA

#### 1.1 SURFICIAL GEOLOGY

High to extreme impact: the scarps are composed of silt and clay susceptible to slumping, minor solifluction and fluvial erosion.

The bridge site is flanked by abandoned alluvial terraces. Most severe erosion will be on southern side, not the northern side as inferred in bridge report. Footings and fill should be on terraces eliminating necessity of special erosion prevention structures.

#### 1.2 SOILS

Soils adjacent to the bridge site are to be overlain with fill and should remain stable.

Care should be taken to confine activities to the road approaches to avoid further disturbance of the erodible soils in this area.

#### 1.3 VEGETATION

The forest cover comprises of mixed stands of black and white spruce and aspen up to 60 feet in height. The existing road and telegraph line cuts have depreciated the appearance of the forest area and further removal of the forest cover should be kept to a minimum.

#### 1.4 WILDLIFE

The extended approach fills to the crossing site may hamper normal movement of animals along the river banks. Slopes should be revegetated with brush species to facilitate adaption of animals to this barrier.

### 1.5 FISH

The bridge design planned for the Ochre River appears undesirable from the fisheries standpoint for several reasons. Most important of these is the removal of a large gravel bar upstream of the bridge site. Removal of gravel from the stream bed could be hazardous to the aquatic environment upstream and downstream.

The dyke itself, in association with the fill it protects, is also a matter of concern. The fills will encroach on almost half of the width of the stream bed. Velocities of the river at higher water levels should be calculated to ensure that excessive velocities are not created. Scouring of the stream bed upstream and downstream can also be expected if these plans are implemented.

Alternate bridge designs should be investigated to minimize adverse impact on fish.

Since the Ochre River is presently subject to extreme turbidity during spring runoff, particular attention should be paid to preventing siltation at times when the stream is relatively clear.

Extensive riprapping of the proposed fills would be a major requirement.

The Ochre River drains an area of 711 square miles and in its lower 24 miles contains an estimated 317,000 square yards of potential spawning area (gravel). Frequently braided, it has many rapids and occasional pools, and the substrate is predominantly large boulders. Numerous landslides were noted in the distance surveyed, in areas where the vegetation has been removed by fire. Fisheries Service crews in 1971 captured lake chub and longnose sucker near the bridge site; mayfly and caddisfly aquatic forms were also found.

### 1.6 ARCHAEOLOGY

There is a known prehistoric site at the mouth of the Ochre River. Areas along the river should be investigated before and during construction.

### 1.7 LANDSCAPE - RECREATION

Pull-outs and rest areas may be incorporated on approach fills although use of the existing road cuts is recommended.

### 1.8 AESTHETICS

The long approach fills, extensive berms and massive bridge will not have much aesthetic appeal. The surrounding landscape has been scarred from previous activities.

### 1.9 SOCIO-ECONOMIC

Not applicable except in context with the entire road.

### 1.10 CONSTRUCTION

Construction of the proposed structure and associated dredging of the riverbed to construct protective berms will be sensitive. The feasibility of removing gravel from the stream bed would depend upon fish movements. Winter construction is recommended.

## PART 2

### ASSESSMENT

The proposed crossing design leaves much to be desired from the aspect of fisheries. Alternate designs that would lessen impact on the stream should be explored.



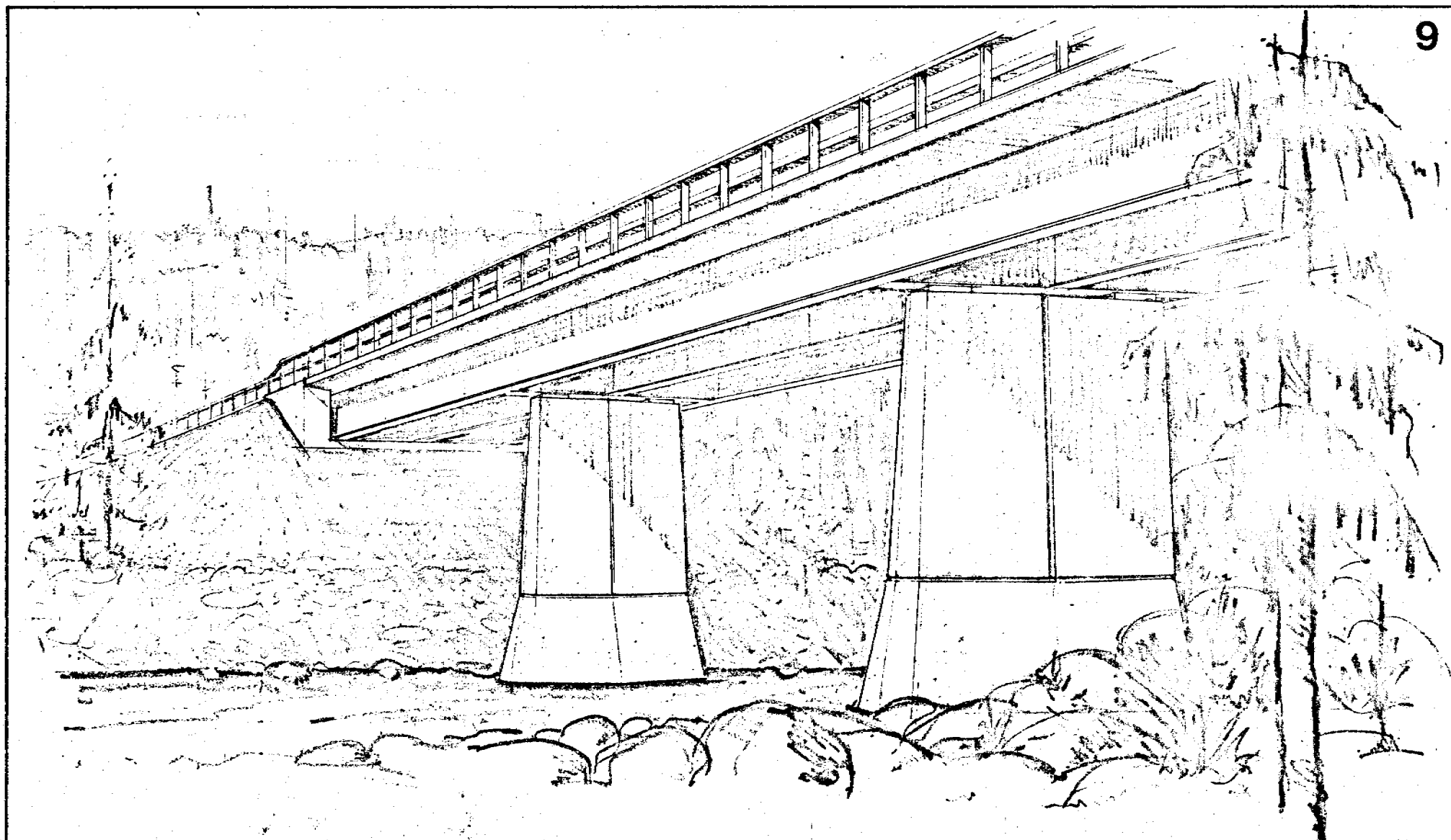


26.10.72. Ochre River. Looking south, winter road, centerline and road centerline visible. Vegetation is aspen, white and black spruce. Soils are peaty gleysols, luvisols and brunisols.

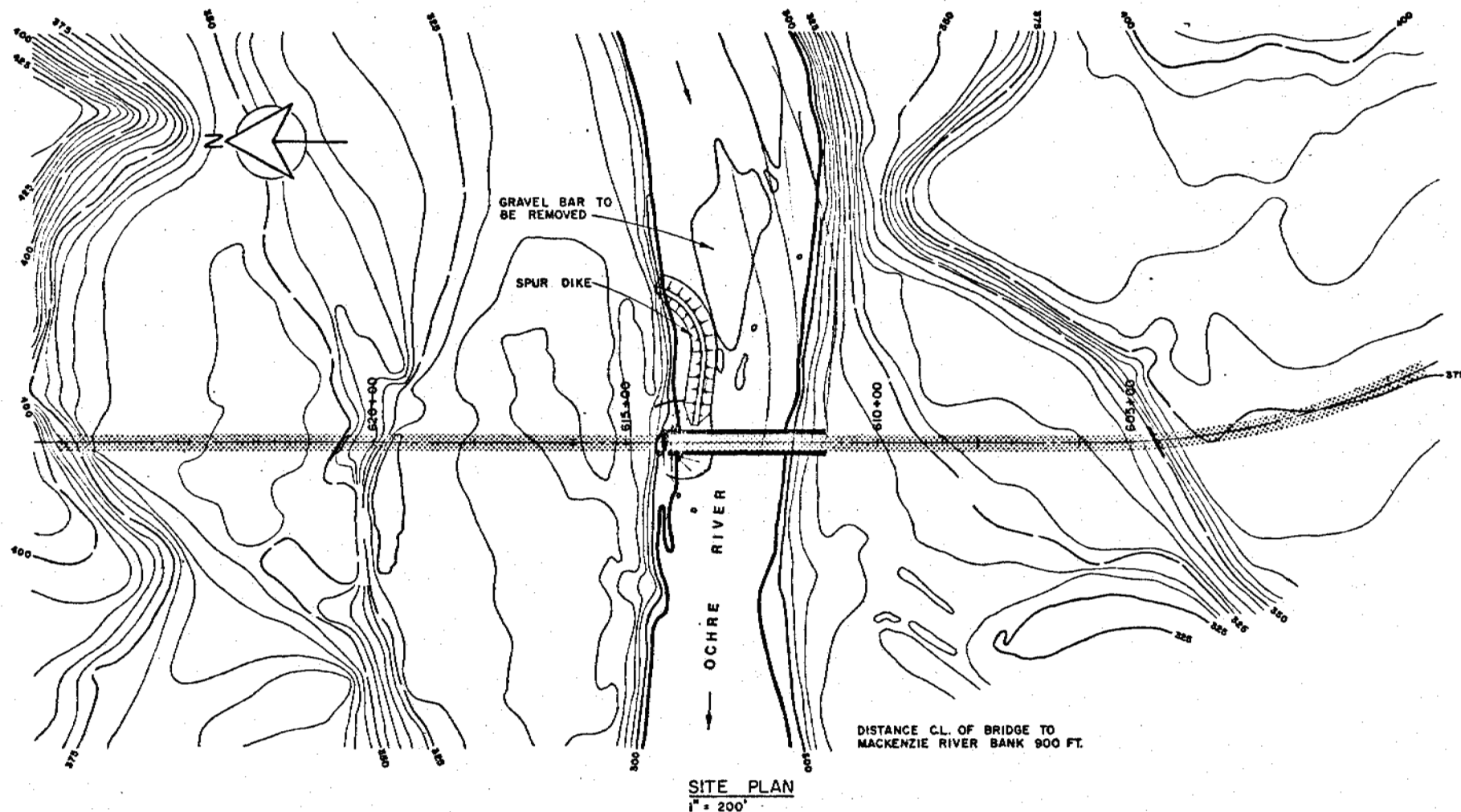


26.10.72. Ochre River. Known prehistoric site on downstream site of river mouth. Notice curve of thalweg; erosion most severe on southern side not on northern side as inferred in bridge report. Bridge footings should be on abandoned alluvial terraces, thereby eliminating special erosion prevention techniques.





RIVER BETWEEN TWO MOUNTAINS  
HODGSON CREEK  
OCHRE RIVER  
WHITESAND CREEK



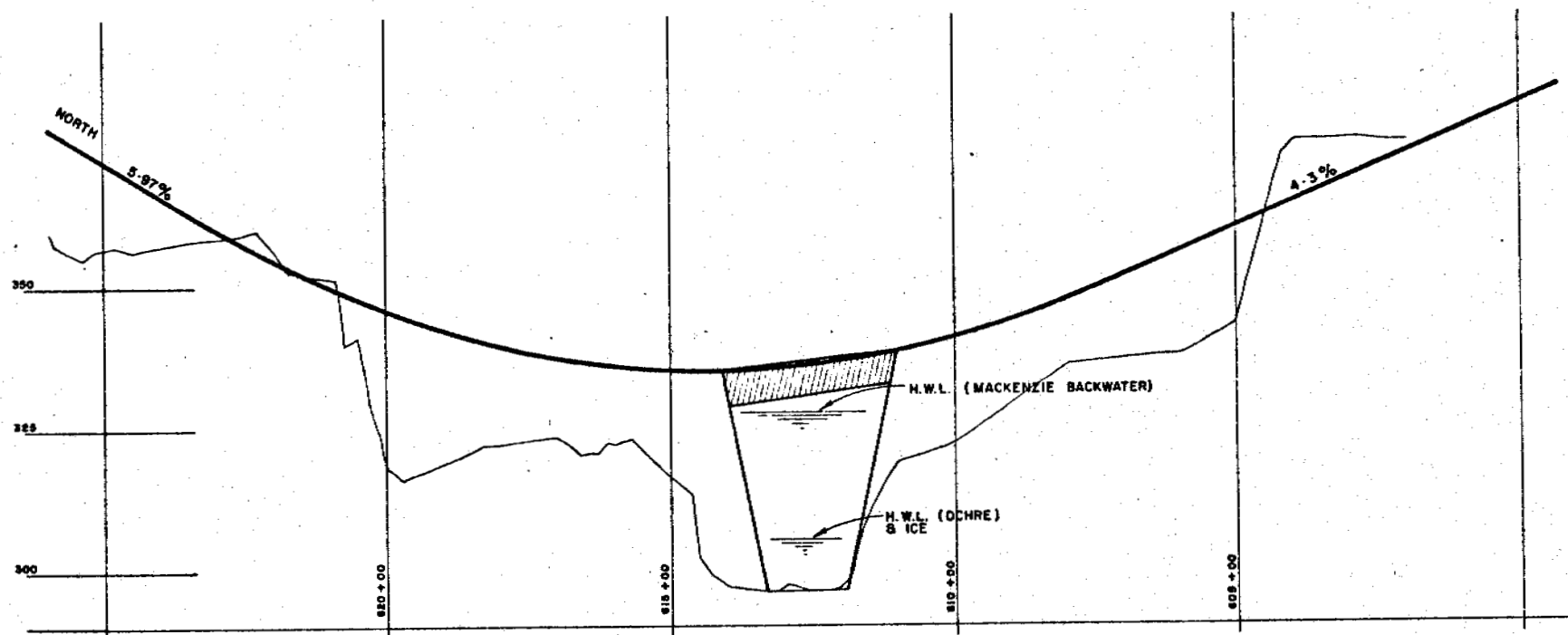
MACKENZIE HIGHWAY

OCHRE RIVER



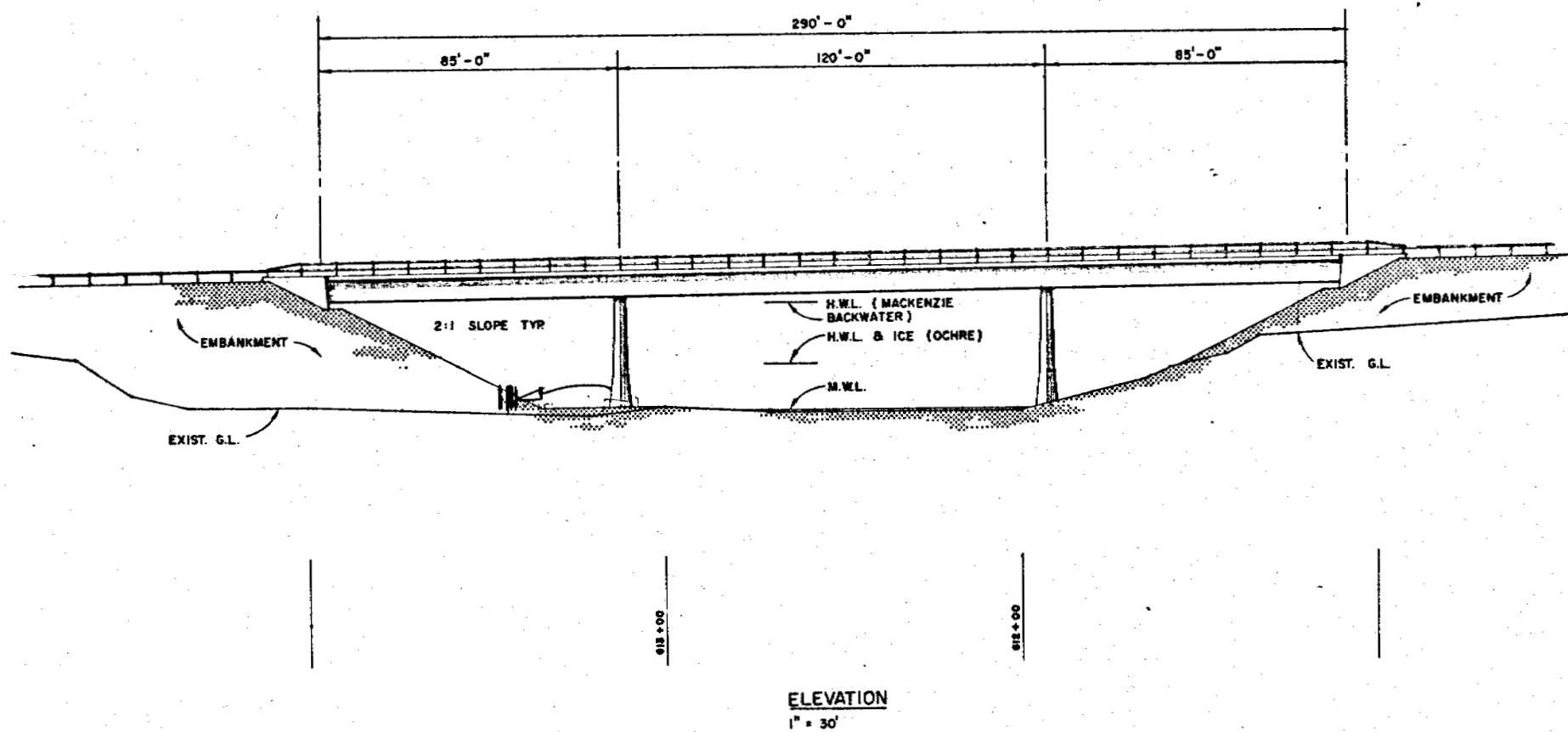
Reid, Crowther & Partners Limited  
CONSULTING ENGINEERS & PLANNERS

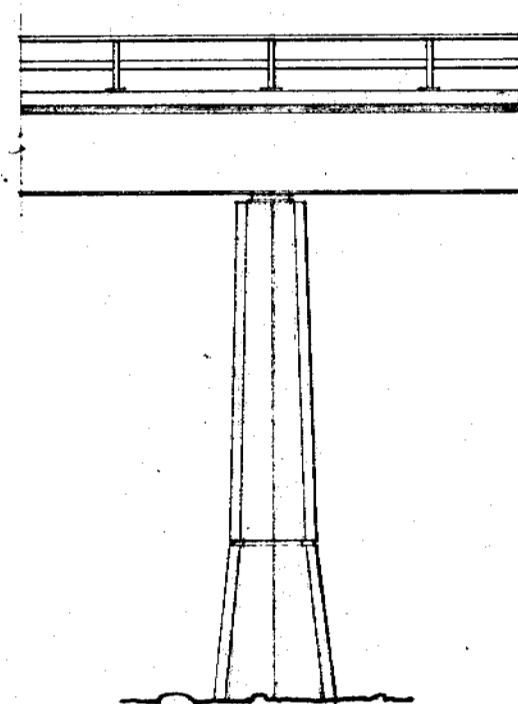
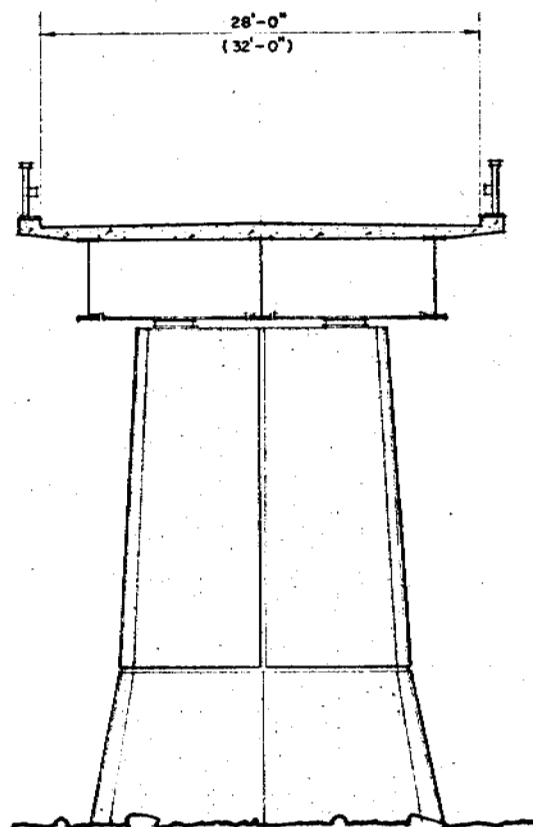
1000 DUNDAS ST. W. TORONTO, ONT. M6H 1B5



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

NOTE:  
 ELEVATIONS ARE TO GEODETIC DATUM.  
 CHAINAGE REFER TO FIELD SURVEY.





SCALE:  $\frac{1}{8}" = 1'$

MACKENZIE HIGHWAY

TYPICAL SECTION  
&  
PIER