PRELIMINARY
BASIC ENVIRONMENTAL DATA

SHALE CREEK
BRIDGE

REFERENCE MILE 332 MACKENZIE HIGHWAY

DEPARTMENT OF PUBLIC WORKS
EDMONTON, CANADA

January , 1973

F. F. SLANEY & COMPANY LIMITED
Vancouver, Canada

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BASIC ENVIRONMENTAL DATA
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MACKENZIE HIGHWAY
NORTHWEST TERRITORIES

DEPARTMENT OF PUBLIC WORKS
EDMONTON, CANADA

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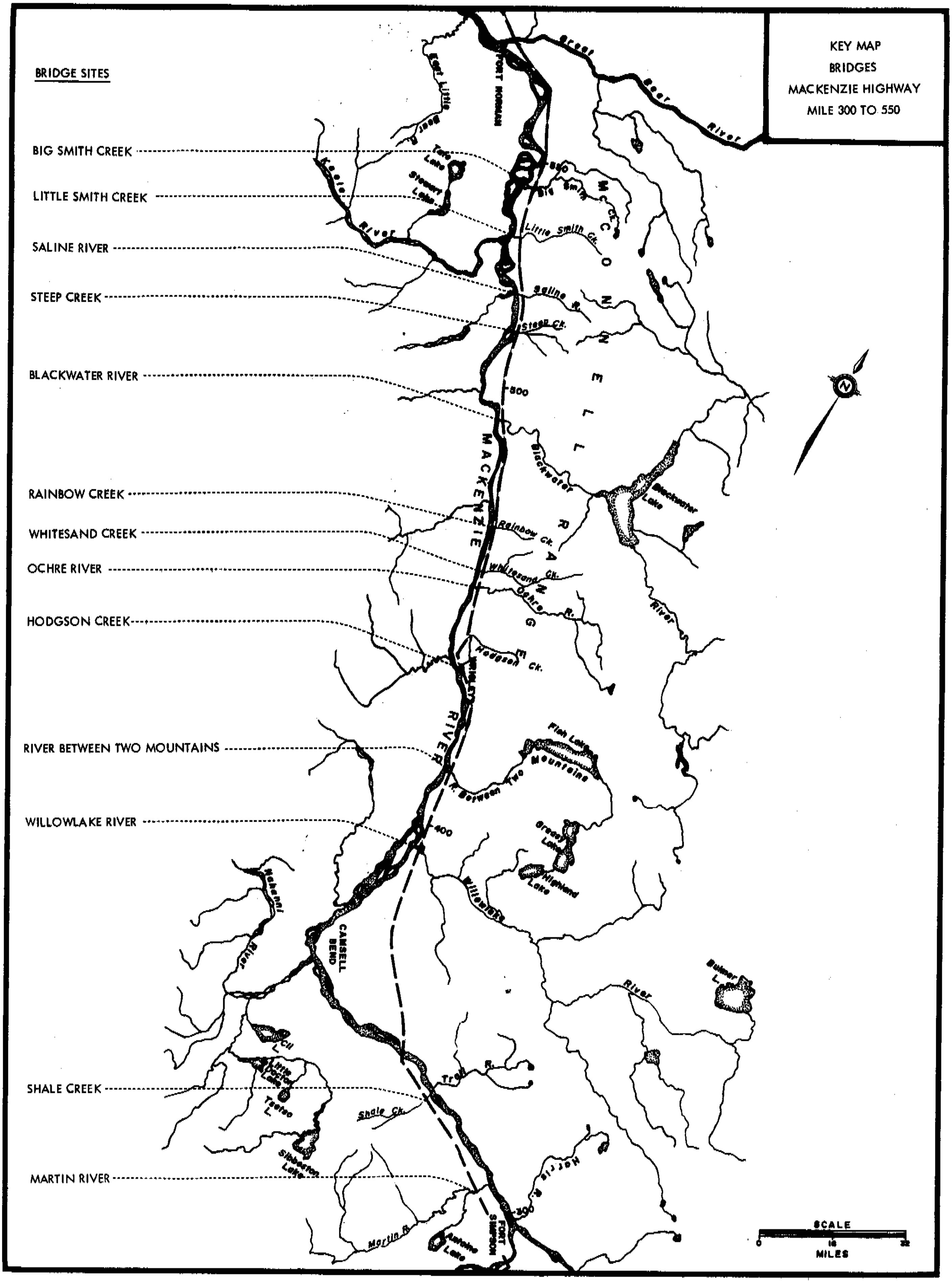

KEY MAP
BRIDGES
MACKENZIE HIGHWAY
MILE 300 TO 550
BRIDGE SITES
BIG SMITH CREEK
LITTLE SMITH CREEK
SALINE RIVER
STEEP CREEK
BLACKWATER RIVER
RAINBOW CREEK
WHITESAND CREEK
OCHRE RIVER
HODGSON CREEK
RIVER BETWEEN TWO MOUNTAINS
WILLOWLAKE RIVER
SHALE CREEK
MARTIN RIVER
FORT NORMAN
Great Bear River
MACKENZIE RIVER
MC CONNELL RANGE
Big Smith Ck.
Little Smith Ck.
Saline R.
Steep Ck.
Rainbow Ck.
Whitesand Ck.
Ochre R.
Hodgson Ck.
Blackwater Lake
R. Between Two Mountains
Fish Lake
Willowlake
Highland Lake
CAMSELL BEND
Shale Ck.
Martin R.
FORT SIMPSON
550
500
400
300
SCALE
MILES
0
16
32


MACKENZIE HIGHWAY
SHALE CREEK BRIDGE
REFERENCE MILE 332

PART 1

BASIC ENVIRONMENTAL DATA

1.1 SURFICIAL GEOLOGY

The banks of Shale Creek appear stable, however the approaches traverse a colluvial unit with solifluction potential on ascent and decent. A gravel outcrop at top of west facing bank confirms the presence of gravel deposit along proposed route. Erosion in approach ditches may silt creeks.

Channel is straight and does not reveal features of unusual erosion.

Eastern approach cut may be subject to small scale slumping of glaciolacustine sediment. Slopes appear stable at present. Ditch drainage should be dispersed to inhibit silt from entering stream.

Western approach slopes appear stable. Top of bank contains gravel which is amenable to use although some groundwater drainage may be required.

1.2 SOILS

Soils are well drained and appear reasonably stable. Slopes of the large cuts and approach fills should be stabilized as early as possible.

1.3 VEGETATION

The crossing cuts through a stand of aspen and white spruce with tree heights up to 60 feet. Top soil and organic soil should be set aside and respread on slopes of fills to facilitate revegetation of unstable soils.

1.4 WILDLIFE

A trapline follows Shale Creek. Care should be taken to avoid interference with trap sets.

1.5 FISH

As for the Martin River crossing, the most serious hazard to the aquatic environment of Shale Creek resulting from the bridge design is the construction of piers in the water. If steel cofferdams are used, siltation will be greatly reduced. Siltation would be minimized, however, if the piers could be placed above the medium water levels of the stream.

Attention should be drawn to the cut on the north bank, which comes close to the Shale Creek valley where the creek oxbows to the north. If any slumping occurs here an excess of silt will be deposited in the stream, with possible fish migration blockage.

No information is available on fish or invertebrate populations in Shale Creek, but it is assumed to contain several species, similar to the Martin River. The substrate at the crossing site consists of gravel up to boulder size; the stream appears to have good potential as a spawning stream.

1.6 ARCHAEOLOGY

Clearing operations to date have not revealed evidence of artifacts. Shale Creek was probably used as a route from the Mackenzie River through to Little Doctor, Cli and Sibbeston Lakes. Contractors should be aware of the medium chance that archaeological sites may be found.

1.7 LANDSCAPE - RECREATION

Fishermen will tend to park on the abutment fill and space should be designed to accommodate recreational vehicles.

The bridge site does not lend itself to recreational development.

1.8 AESTHETICS

The proposed bridge design which is identical to the proposed Martin River structure appears more appropriate in this site. The advantage of a longer span is not as pronounced as at the Martin but any design which keeps the toe of slopes out of water channels is advantageous.

1.9 SOCIO-ECONOMIC

Not applicable except in context with the entire road.

1.10 CONSTRUCTION

Construction should be possible year round except when stream flows are in flood.

Construction crews should use the road to operate from camps near Fort Simpson. General site disturbance is not anticipated.

All construction scars and fill slopes should be revegetated to ensure stabilization and habitat maintenance.

PART 2

ASSESSMENT

Bridging Shale Creek should not create a significant impact on the environment.

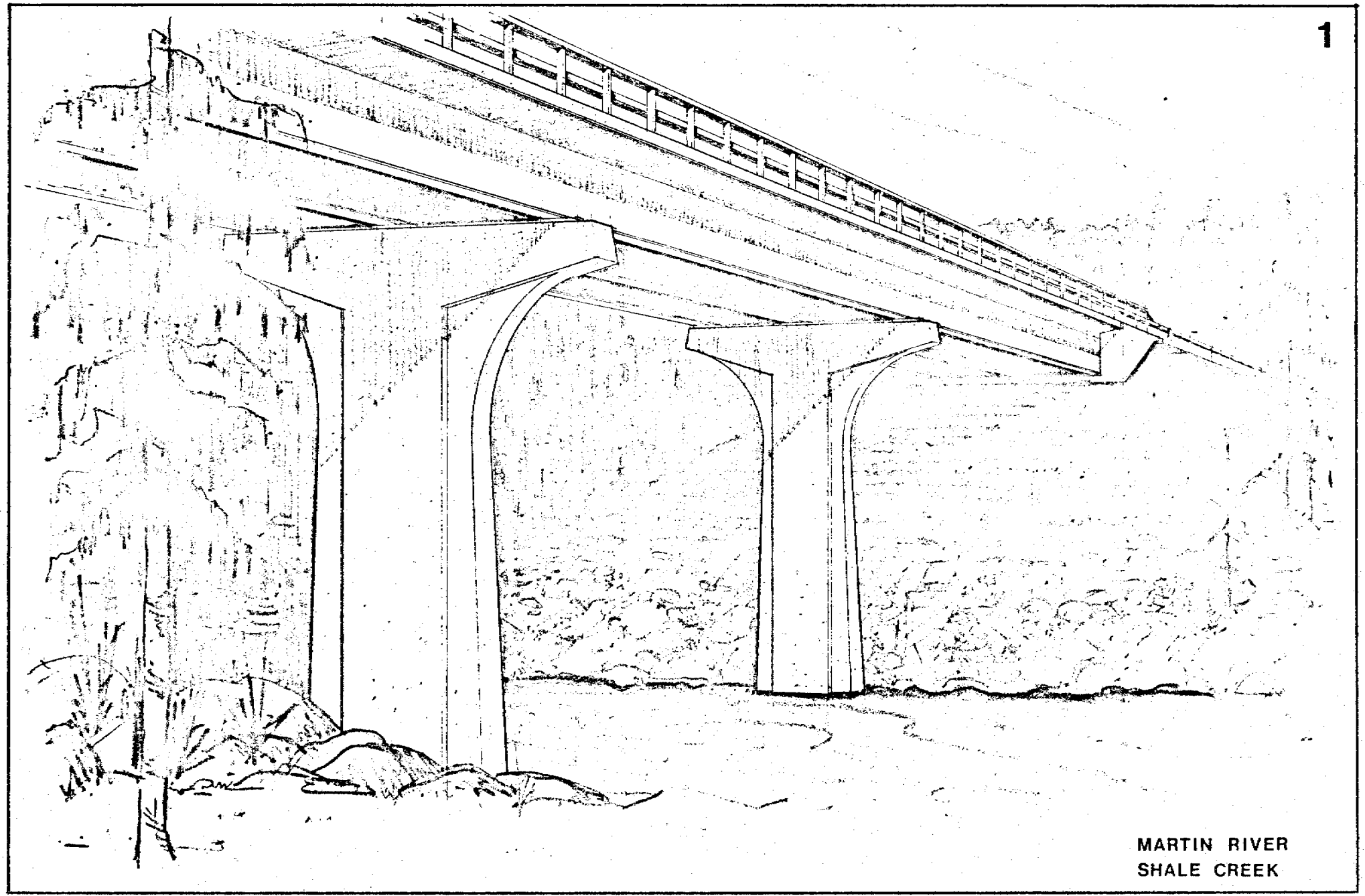
The generally stable site could be worked winter or summer provided the temporary crossing of the Martin River is stable during summer months.

24.10.72. Shale Creek: east bank on left. Vegetation is white and black spruce with aspen. West bank consists of colluvial slope in glaciofluvial or alluvial gravel overlying glaciolacustrine deposits; bank appears stable.

24.10.72. Shale Creek looking east. Glaciolacustrine material; slopes appear stable; drainage along southern ditch should be diverted or settling ponds established to minimize siltation of creek.

24.10.72. Shale Creek looking west. Gravel outcrops at top of bank in cut; composition of underlying material unknown, believed to be glaciolacustrine origin; colluvial slopes appear stable; surface drainage on north side must be controlled to minimize siltation; groundwater drain recommended.

5.11.72. West slope of Shale Creek. Pebble gravel exposed in route cutbank on west side of Shale Creek. Unit appears to be quite extensive and is believed to be a glaciofluvial terrace of the Mackenzie River.



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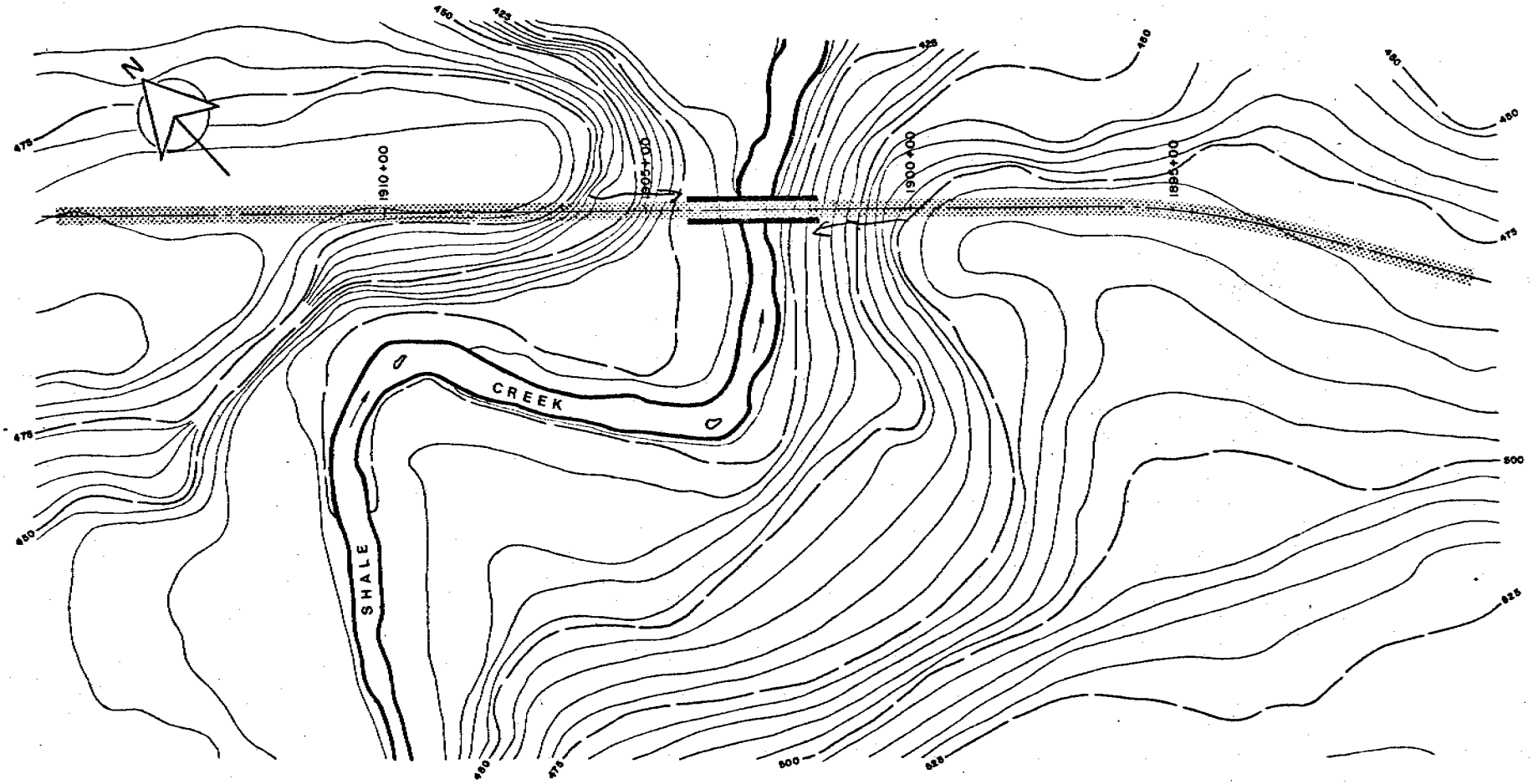
MARTIN RIVER
SHALE CREEK



SITE PLAN

Reid, Crowther & Partners Limited
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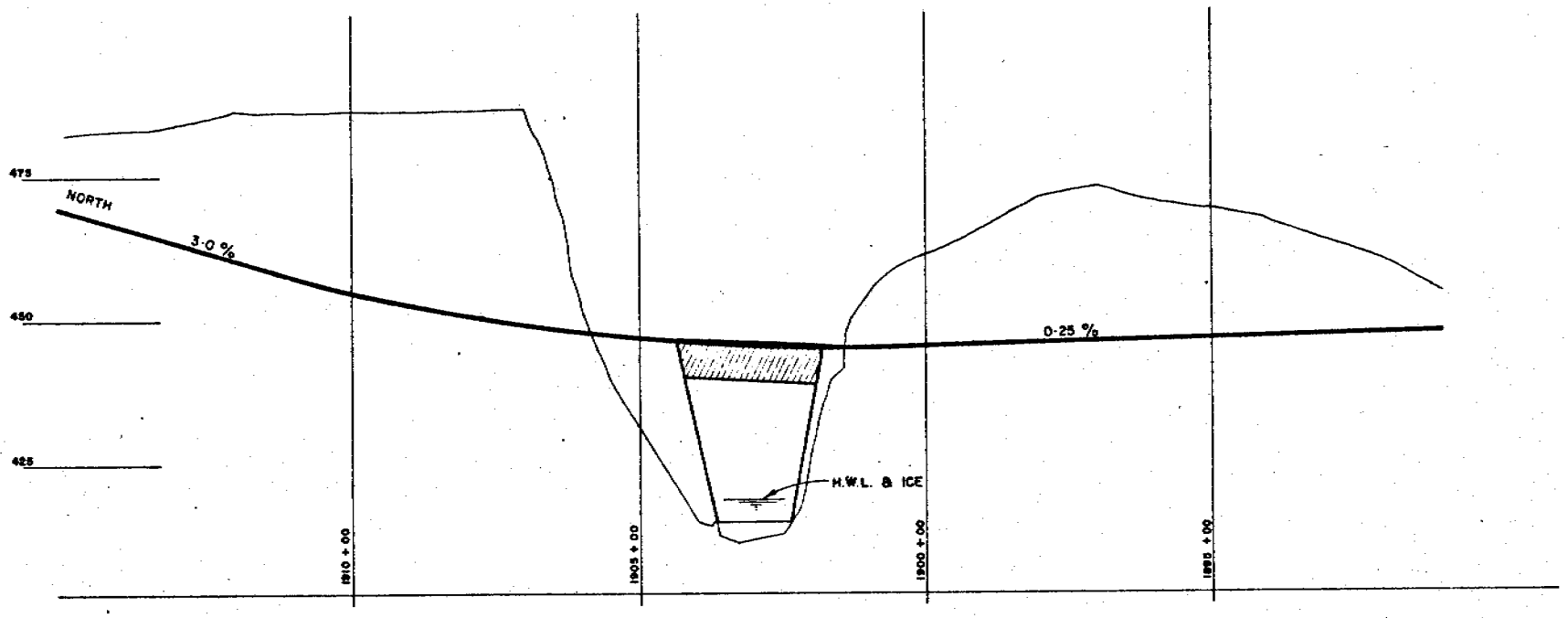
VANCOUVER CALGARY EDMONTON REGINA WINNIPEG TORONTO

MACKENZIE HIGHWAY

SHALE CREEK



PROFILE
Vertical scale
Some stream

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

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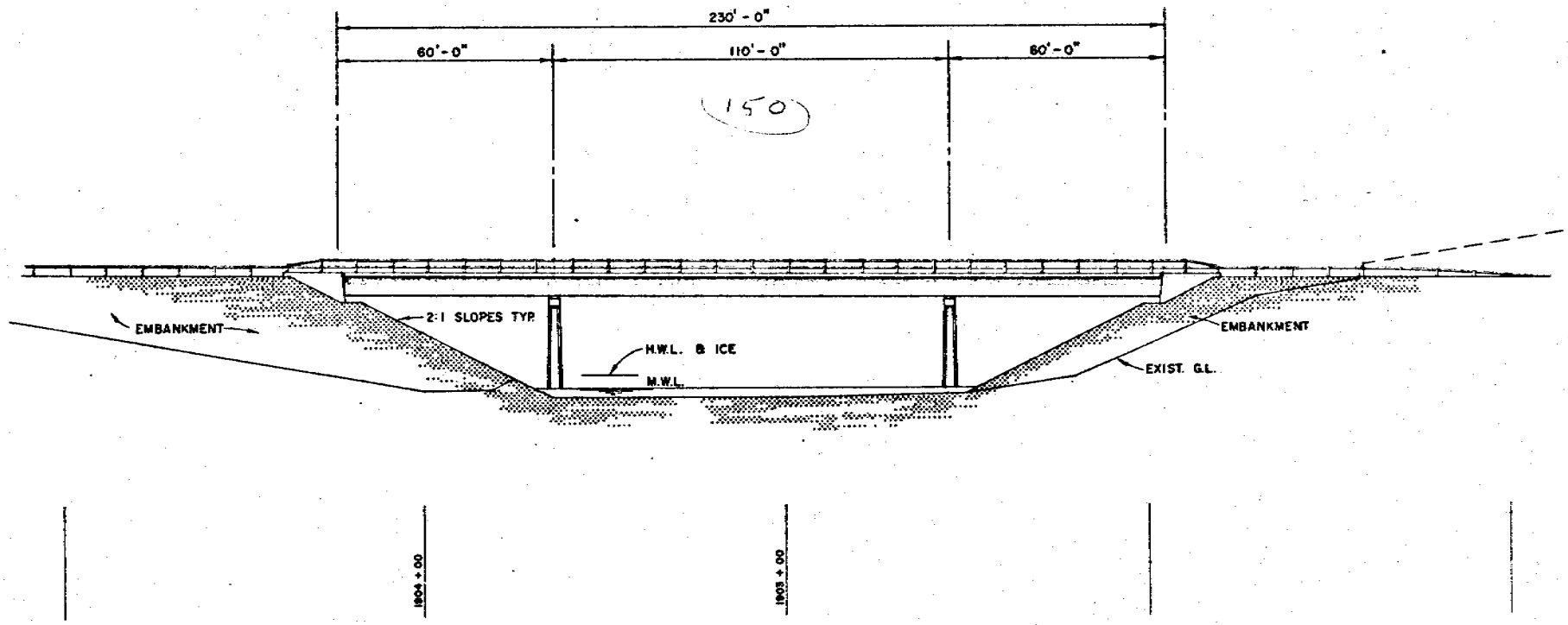

ELEVATION

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