

Department of Public Works

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Geology Report

LAPIE RIVER BRIDGE SITE

Mar. 24, 1965.

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CONCLUSIONS

Due to profuse jointing , the limestone rock is only reasonably competent.

It is strongly recommended that the south approach footing be placed as shown, back of the probable faults. Footings on the north approach at Sta. 288 + 21.7 are on reasonably safe ground.

Diamond drilling may be misleading; owing to the large number of non-parallel joint planes, the important faults would be difficult to recognize. However, large faults with associated gouge would be recognizable. A diamond drill hole at Sta. 288 + 21.7, directed at 320 Az., inclined 10 from vertical, and carried for about 80 ft. might indicate if the probable marked fault carries through beneath the roadway. Bulldozer trenches to bedrock would be shallow and serve the same purpose.

Depth of overburden at Sta. 281 is probably 75 ft. or more.

INTRODUCTION

Mar. 24, 1965, the writer inspected the proposed site for the Lapie River Bridge on the Ross River - Carmacks Road in order to ascertain:

- " 1) The soundness of the rock.
- 2) Recommendations for location of footings foundations.
- 3) Necessity of Diamond Drill Holes.
- 4) If so, location, depth, and directions required.
- 5) Location of weak rock structures.
- 6) Other pertinent comments.
- 7) Depth of overburden opposite Sta. 281.

with proviso that the south approach may be revised but the location of the bridge is firm. " 1.

1. As given in the request.

GEOLOGY

Geomorphology (~~see map opposite~~).

Regional glaciation in the area trends S 80 W, leaving morainal debris, outwash plains, and scoured ridges. The Lapie River trending N 50 W crosses outcrop area in the vicinity of the bridge site, first swinging parallel to the ridge direction, then cutting directly through in a canyon 150 ft. deep. The present river has partially undercut (up to 5 ft.) the buttress&s at the bridge site but chief erosion is by spalling with only a few large fragments having slumped.

The terrace in question at Sta. 281 most likely has a depth equal to or exceeding the river-cut bank relief lateral to this location. It appears to be a strath terrace of the Lapie R. abutting the rock cliff on the north, and shelving upwards to the west (with gradually decreasing depths) on the outcrops of the bridge site. The few exposures available were composed essentially of glacial till, though they appear to be somewhat better sorted, with better rounded particles, than typical outwash. Better exposure after the snow melts would allow proper determination.

Rock Type

Cliff faces beneath the bridge site are variably a fine to medium grain, micaceous, dark grey limestone, and a white to light yellow sub-breccia of quartz in limestone in which angular and sub-rounded quartz fragments are cemented by coarse-grained, sub-hedral calcite. Little alteration is present. There is no apparent schistosity.

Structure (see map opposite)

Profuse jointing (e.g. average distance between fractures is approximately 1 ft.) gives the rock a friable appearance belying its apparent soundness. Jointing attitudes are irregular but prominent joints (or faults) affecting the strength of the rock were noted at attitudes of 50, 70, 90, & 170 strike azimuths with dips over 80. Striations on the 170/vertical fault face trending 15 north dip, and on the 90/vertical trending 10 east dip indicate shearing in these respective directions. Faults directly affecting the stability of the canyon walls are marked on the map. These generally extend the full height of the cliff.

G.S.C. (Map 7 - 1960, Wheeler, Green, and Roddick) give the local bedding attitude at approximately 115/45 S (strike azimuth/ dip of bed, direction of dip). Possible cross-bedding was noted at 100/10 N. However, it is assumed that bedding has little or no effect in the problem.

Respectfully submitted,

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