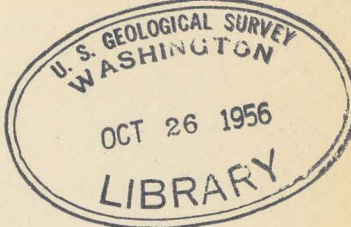


DESCRIPTION OF GEOLOGIC UNITS IN THE KATALLA AREA, ALASKA



PLEASE REPLACE IN POCKET
IN BACK OF BOUND VOLUME

GEOLOGIC UNIT	GENERAL DESCRIPTION	DISTRIBUTION AND THICKNESS	TERRAIN AND NATURAL SLOPE	DRAINAGE	ENGINEERING GEOLOGY
Landslide (Qls)	Masses of sedimentary rock which have loosened and slipped down slopes. Landslides generally slip to bottom of hill or slope.	Large slides have developed along the east flank of Ragged Mountain, north of Martin River, and on the east flank of Charlotte Ridge. Numerous smaller slides occur throughout the mapped area. Maybe as much as 100 feet thick.	Broken surfaces containing benches, ridges, and depressions. Slopes range from nearly flat to steep.	Surface drainage generally good; sub-surface drainage generally poor.	Unsuitable as road foundation. Slides are subject to additional sliding. Poor source of borrow material.
Talus (Qta)	Loose rock pried from bedrock cliffs by frost action and other weathering processes and deposited as aprons and cones on gentle slopes below. The rocks are angular, unsorted and range from a few inches to 10 feet or more in diameter.	Large deposits occur along the east flank of Ragged Mountain, and east of Martin Lake. They range from 5 to 50 feet in thickness.	Generally smooth surfaces except at bottom of deposit where larger boulders occur. Slopes range from gentle to steep.	Good	Unsuitable as road foundation because deposit is generally in delicate equilibrium. Abundant source of riprap. Good source of coarse borrow material if crushed.
Alluvial sand (Qas)	Clean, washed fine- to coarse-grained sand with minor amounts of silt interspersed with gravel bars. Alluvial sand deposited by large glacial rivers is underlain by sandy gravel; alluvial sand deposited by the Katalla River and minor streams is underlain by fine sand and silt.	Extensive areas underlie the flood plains of (1) the Gandil, Nichawak, Martin, and Bering Rivers, (2) the Copper River Delta, and (3) the Katalla River. Smaller areas occur along the numerous tributaries of these rivers. Alluvial sand deposits vary from 1 to 15 feet in thickness.	Nearly flat marshy surfaces crossed by a few winding sloughs and minor streams. Lakes, meadows, and small swamps are common.	Varies from poor to fair.	Vary from poor to fair as road foundations and as source of borrow. The flood plains of the Gandil, Nichawak, Bering, Copper, and Martin Rivers will generally offer fair road foundation because they are underlain by sandy gravel. All other areas will offer poor to fair foundations.
Swamp deposits (Qs)	Large areas in which drainage is impeded so that soils are saturated all year. Standing water a few inches deep covers much of the surface. Deposit consists of peat, muck, and silt generally underlain by silt and fine sand. South of the Bering River deposit is underlain by sand and gravel.	Large swamp deposits are (1) in the Katalla valley, (2) north and west of Ragged Mountain, (3) south of the Bering River, and (4) south of Kushtaka Lake. Small swamps are scattered throughout the mapped area. Deposits are as much as 3 feet thick.	Flat surfaces	Poor	Unsuitable as road foundation where underlain by sand and silt. May offer fair foundation where underlain by sand and gravel, if the swamps are drained. Generally a poor source of borrow.
Meadow deposits (Qm)	Meadows consist of spongy material made up of grasses, sedges, mosses, fine sand, and silt. Locally meadows are swampy and contain deep, steep-sided small pools.	Extensive deposits are (1) in the Katalla valley, (2) west and southeast of Martin Lake, and (3) along the southern margin of Ragged Mountain. Numerous smaller deposits occur locally, on the upper slopes of the mountains. Deposits range from 1 to 8 feet in thickness.	Generally flat and gently sloping surfaces. Locally on top of low mountains and on moderate slopes of mountains.	Poor	Unsuitable as road foundation and source of borrow.
Alluvial fan deposits (Qaf)	Alluvial fans consist of interfingering lenses of clean, washed sand, pebbles and cobbles. Rocks are subangular to rounded. Average grain-size of rocks decreases with increasing distance from slopes or source of material.	Extensive fans are (1) on the east, south, and west slopes of the mountains bounding Katalla valley, (2) between Katalla valley and Bering Lake, and (3) south of Martin Lake. Smaller fans occur along the numerous small creeks in the area. Deposits are as much as 15 feet thick.	Fans have relatively little relief and stand only a few inches higher than their stream channels. Slopes are gentle.	Good	Good as road foundation. Selective borrowing will yield usable sand and gravel for fills. Depth of borrow pits will be controlled by the water table, which ranges in depth from a few inches at the toe of the fans to 10 or 15 feet at the head of the fans.
Beach deposits (Qbd)	Constructional shoreline deposits consisting of barrier beaches, sand bars, spits, cusped forelands, and bay-mouth bars. Deposit consists of clean washed sand, pebbles, and boulders. Little if any fines.	Deposits are along shorelines and in Katalla valley. Thickness of deposit is unknown, but may be from 25 to 75 feet thick.	Smooth, flat, gently sloping surfaces.	Good	Excellent as road foundation. However, deposit has insufficient fine material for road surfacing.
Terrace deposits (Qt)	Bedrock planed by wave-action and in large part mantled by swamp deposits (Qs) and meadow deposits (Qm). Terrace sediments consist of gravel, sand, silt and clay.	Deposits lie (1) west of Katalla, (2) along the south and west flanks of Ragged Mountain, (3) west of Martin Lake, (4) on Fox and Whale Islands, and (5) north of the Martin River on the west flank of the Chugach Mountains. Measured thicknesses of deposits range from 3 feet west of Katalla to 46 feet on Whale Island.	Smooth surfaces flat or gently sloping.	Generally good. Locally poor where deposit contains excessive silt- or clay-size material.	Good as road foundation in the well-drained areas. Fair in locally poor areas of drainage. In areas overlain by a thin mantle of swamp or meadow deposits, good as road foundation if swamps or meadows are removed.
Outwash (Qo)	Glacial debris reworked by meltwater streams. Outwash deposits consist chiefly of well-rounded pebble-cobble gravel, clean washed sand, and minor amounts of silt and clay.	Outwash deposits occur (1) west of the Martin River Glacier, (2) west of the Bering River Glacier, (3) north and south of Kushtaka Lake, (4) south of Kushtaka Lake, and (5) along the west flank of the Chugach Mountains. Thickness unknown but may be as much as 50 feet.	Nearly flat surfaces with local relief of 5 to 15 feet consisting of low escarpments, bars, and swales marking the course of ancient stream channels.	Drainage varies from poor to good. Low, indented areas and the outer margins of outwash plains are poorly drained.	Well-drained areas offer good road foundation. Poorly drained areas will also offer good road foundation if adequately drained. Source of small quantities of good borrow material.
End, lateral, and ground moraines (Qmo)	Moraines generally consist of 35 to 70 percent gravel, 25 to 50 percent sand, and less than 6 percent silt or clay. Moraine south of Kushtaka Lake (pl. 3) consists chiefly of cobbles and boulders at the surface. Boulders up to 10 feet across are common and a boulder 25 feet across was noted. Rocks are subangular to angular granite, sandstone, metamorphic rocks and volcanic rocks.	Moraines are restricted to the Kushtaka Lake, Charlotte Lake, and the Martin River areas (pl. 3 and 4). Maximum thickness of moraine is unknown. However the moraine damming Kushtaka Lake is at least 125 feet thick and may be as much as 175 feet thick.	Areas of rough topography consisting of ridges 20 to 100 feet high, separated by swales and undrained depressions. Slopes are generally moderate to steep.	Outer margins generally well drained. Inner margins vary from poorly drained to well drained.	Well-drained moraines generally good as road foundations. Poor to good source for borrow material. Excessive boulders on Kushtaka moraine would require crushing of material from this moraine.
Sedimentary rocks (Tss)	Chiefly thin- to thick-bedded sandstone, shale, argillite, arkose, siltstone, and conglomerate with minor amounts of mudstone and claystone. Rocks locally metamorphosed in areas adjacent to metamorphosed rocks (pTm). Rocks moderately jointed generally spaced 2 to 4 feet apart.	Exposed extensively throughout the mapped area.	Mountainous terrain with gentle to steep slopes. Mountain tops generally rounded with locally sharp peaks.	Good	Excellent as road foundation. Fair as riprap. Locally over-breakage during blasting will occur in the thin-bedded units.
Metamorphosed rocks (pTm)	Slightly to moderately metamorphosed silty and sandy sediments with greenstone, graywacke, and minor amounts of chert, limestone, and intrusive igneous rocks. Rocks are complexly faulted, folded, and intensely jointed.	Exposed (1) on Wingham Island, (2) on Ragged Mountain, and (3) in the Chugach Mountains.	Mountainous terrain with gentle to steep slopes. Mountain tops generally sharp.	Good	Excellent as road foundation. Good source for riprap. Over-breakage may result from blasting. Insufficient fines for good borrow material.