BASE BY U.S. GEOLOGICAL SURVEY, 1966

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

MAP SHOWING CONSTRUCTION MATERIALS IN THE FAIRBANKS D-2 NW QUADRANGLE, ALASKA

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SOURCES OF CONSTRUCTION MATERIAL

This map is based on data presented on the Geologic map of the Fairbanks D-2 NW quadrangle (Map I-907, Péwé and others, 1975), the Map showing distribution of permafrost in the Fairbanks D-2 NW quadrangle (Map MF-668A, Péwé and Bell, 1975a), the Map showing ground-water conditions in the Fairbanks D-2 NW quadrangle (Map MF-668B, Péwé and Bell, 1975b), and the Map showing foundation conditions in the Fairbanks D-2 NW quadrangle (Map MF-668D, Péwé and Bell, 1975c). Additional information, especially detailed subsurface data, can be obtained from these maps.

This map provides basic information on where construction materials may be obtained near the surface. The map units are defined on the basis of type of material and distribution of permafrost.

The upland hills are bedrock with a cover of as much as 200 feet of windblown silt (loess). The suitability of the bedrock for use in construction is variable, and the bedrock generally is not as good a source of gravel as the flood plain. Recently, the bedrock has been widely used as a decorative rock rather than as a source of gravel. The best sources of coarse material in the upland areas are the placer-mine dredge tailings, which are excellent for foundation material and pervious fill, especially when processed.

The upland hills are generally free of permafrost and present no major excavation problems. The silt mantle generally is well drained, dry, and very easily removed unless it is frozen. The bedrock may contain an upper weathered zone about 3-10 feet thick that is easily removed compared with the fresh bedrock, which in some instances has to be blasted.

The valley bottoms of the upland contain thick silt accumulations that are perennially frozen with high ice content. The silt also contains much organic material, and, as a result, these deposits generally are undesirable as sources of material. Silt is the only easily accessible material, and, if it is frozen, blasting is required. Creek gravel (exposed as tailings) is buried 30-300 feet beneath the silt, making it usually inaccessible.

Areas containing peat have been included on the map because peat is a good resource material, though not suitable for construction. Peat occurs in oval-shaped bodies within the valley-bottom silt.

It should be noted that the map units are generalized and local variations may occur, especially near contacts between units. Detailed mechanical analyses, soil properties, and moisture contents are given on the foundation conditions map.

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EXPLANATION

I
BEDROCK

Upper 3-10 feet is weathered and decomposed bedrock; primarily gravel (50-60 percent) with sand (20-30 percent) and silt (10-30 percent). Fresh bedrock may be a soft schist or a harder variety containing quartzite; locally contains marble; contains hard quartz veins. Fresh bedrock cut by numerous joints, fractures, and foliation planes. Both fresh and weathered bedrock covered by as much as 3 feet of windblown silt. Generally free of permafrost; north-facing slopes may contain permafrost with low ice content

Weathered bedrock easily excavated with hand or power tools unless frozen. Fresh bedrock generally is easily excavated with little to moderate blasting even where containing permafrost; some varieties, especially those high in quartzite or vein quartz, may require additional blasting. Resistant layers more easily excavated where interbedded with schistose rocks; excavation easier where joints, fractures, and foliation planes abundant. Schist varieties good for unclassified embankment fill, but only poor to fair for selected use as base course when processed; breaks down to silt with repeated traffic and frost action. Harder varieties good for rip rap and ballast, and coarse aggregate; if processed, good for base course and road metal. Many varieties, especially the marble, are good as decorative rocks

II
TAILINGS

Placer-mine dredge tailings exposed as steep imbricate gravel piles; locally leveled; 3 to more than 75 feet thick. Primarily gravel (95 percent) with fragments 1-6 inches in diameter and some cobbles 10 inches or larger; sand (3 percent) and silt (2 percent). Well sorted as result of dredging process; undisturbed gravel may contain as much as 50 percent sand and is less well sorted. Only locally perennially frozen; well drained except in some depressions

Material is loose and porous and easily excavated by power tools unless frozen. Good for subgrade, ballast, rip rap, pervious fill, and, if processed, good for base course and aggregate. Water table generally lies at base of tailings

III
LOESS

Windblown silt 3-200 feet thick covers upland hilltops and middle and upper slopes; not mapped where less than 3 feet thick. Silt is well sorted; less than 10 percent clay; locally organic. Free of permafrost except in isolated patches with little or no ice content on north-facing slopes. Where loess overlies muck, both units are mapped as muck. Loess overlying muck is shown only in cross section. Overlies bedrock

Easily excavated with hand tools unless frozen. Stable in nearly vertical cuts in original position; loses much of vertical stability upon reworking. Good source of fine-grained sediment and possible source of impervious fill. Loess is powdery when dry, plastic and sticky when wet. Generally above water table and well drained. Good agricultural soil if fertilized

IV
MUCK

Valley-bottom accumulations of reworked silt 30 to more than 300 feet thick; perennially frozen with high ice content. Well sorted, less than 10 percent clay; locally contains layers and lenses of sand and gravel. Contains abundant organic matter. Poorly drained and marshy in summer; land clearing produces quagmire. Overlies old creek gravel more than 100 feet thick. Where loess overlies muck, both units are mapped as muck.

Very difficult to excavate unless thawed; blasting moderately successful. When thawed, viscous sediment slides into excavation, except near contact with the loess. Thawed and dry muck easily excavated; can maintain fair vertical stability. Possible source of fine-grained sediment and impervious fill where organic content relatively low. Water table locally high where perched on permafrost. Poor to fair for agriculture if fertilized and drained

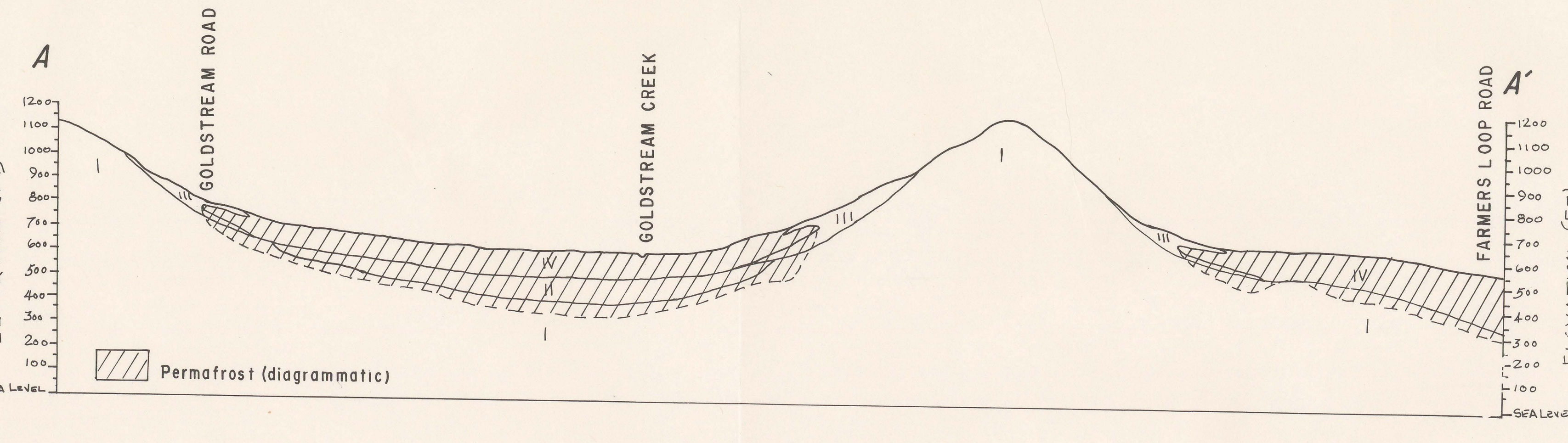
V
PEAT

Large oval-shaped areas in valley-bottom muck are rich in peat; 3 to more than 20 feet thick; perennially frozen with high ice content. Very difficult to excavate unless thawed; blasting only moderately successful. When thawed, viscous sediment slides into excavation. Good source of raw peat in thawed areas. Poor drainage usually requires dewatering of excavation pits

SYMBOLS

Contact
Generally indefinite or gradational

Gravel pit



VERTICAL EXAGGERATION X 4

GENERALIZED CROSS SECTION

For sale by U. S. Geological Survey, price $.50

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