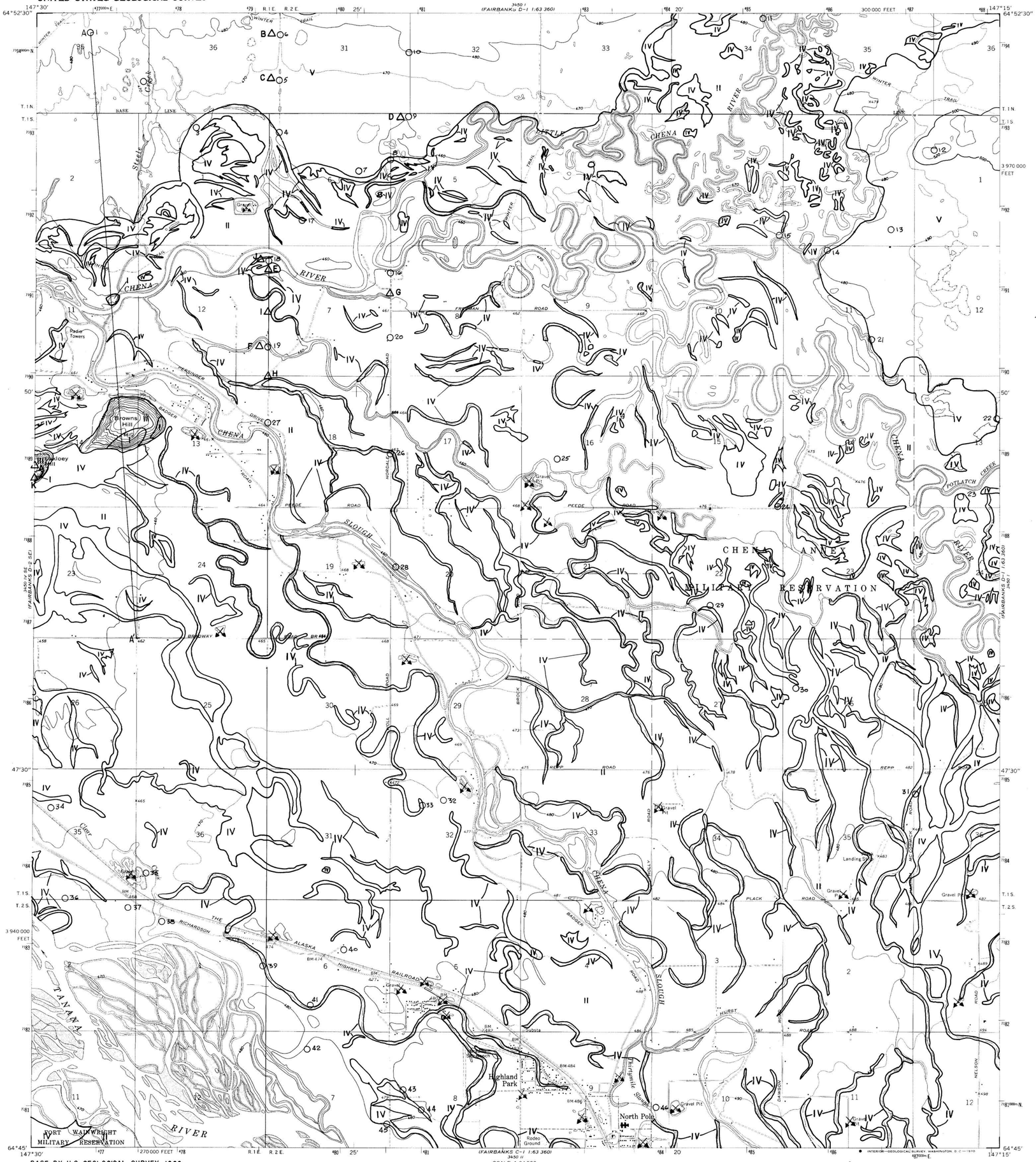
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF – 671-D

SHEET 1 OF 2

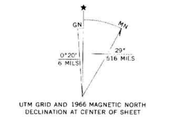


BASE BY U.S. GEOLOGICAL SURVEY, 1966

SCALE 1:24 000

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER
MILE

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL



UTM GRID AND 1966 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

MAP SHOWING FOUNDATION CONDITIONS IN THE FAIRBANKS D-1 SW QUADRANGLE, ALASKA

BY
TROY L. PÉWÉ AND JOHN W. BELL

1975

I

BEDROCK

Igneous and metamorphic bedrock, exposed primarily on hilltops and steep slopes where loess cover is less than 3 feet thick, underlies surficial deposits in all the quadrangle. Upper part is weathered. Where permafrost is present, ice content is low or absent but may be higher in weathered bedrock. No subsidence upon thawing of unweathered bedrock but may be slight upon thawing of weathered material. Frost action absent in unweathered bedrock but may be moderate in decayed bedrock. Unweathered bedrock has high bearing strength

II

RIVER GRAVEL

River flood-plain sand and gravel covered by as much as 15 feet of silt; thickness, 1 foot to more than 400 feet. Discontinuous permafrost. If frozen, silt layer may have low to moderate ice content in the form of thin ice seams; underlying sand and gravel have low ground-ice content, restricted to pore spaces. Silt will show some subsidence upon thawing; sand and gravel will show no subsidence upon thawing. Silt may undergo intense frost action, but sand and gravel will undergo none. High bearing strength when frozen; sand and gravel high when thawed; silt moderate to high when thawed and well drained, low when poorly drained

III

LOESS

Windblown silt present on middle and upper slopes and on low hilltops; 3 to more than 200 feet thick. No mapped where less than 3 feet thick. Generally free of permafrost; north-facing slopes may contain permafrost with little or no ice content. Mildly susceptible to unsusceptible to seasonal frost action. High bearing strength when dry and in original position; very low when wet. Will stand in nearly vertical slopes. Extremely susceptible to gullying

IV

RIVER SILT

River silt in broad, basinlike areas and elongate, sinuous meander scars; generally less than 15 feet thick but may be more than 30 feet. Discontinuous permafrost with moderate to high ice content as thin seams and small lenses. Young sloughs generally contain no permafrost. Moderate to great subsidence upon thawing. Seasonal frost action intense. High bearing strength when frozen; very low when thawed. Slopes subject to sloughing and landsliding upon thawing until well or moderately well drained

V

MUCK

Reworked silt in valley bottoms and on lower slopes; 3–30 feet thick. Perennially frozen; moderate to high ice content as seams and lenses; overlies unit VI, which has high ice content as seams, lenses, and large foliated ice masses. Ice content may be low and permafrost sporadic near unfrozen loess zone upslope. Great differential subsidence upon thawing. Seasonal frost action intense. Permafrost causes poor drainage. High bearing strength when frozen or dry; very low when wet or thawed. Subject to sloughing and sliding upon thawing. Very susceptible to gullying

VI

PEAT MUCK

(In cross section only)

Reworked organic silt in valley bottoms; 10 to more than 300 feet thick. Perennially frozen; high ice content as ice seams, lenses, and large foliated ice masses. Large ice masses near surface result in large polygonal pattern of trenches. Great differential subsidence upon thawing. Seasonal frost action intense. Permafrost results in poor drainage. High bearing strength when frozen; very low when thawed. Slopes in cuts subject to sloughing and landsliding upon thawing

SYMBOLS

Contact

Generally indefinite or gradational

Gravel pit

○98

Site of subsurface data

△B

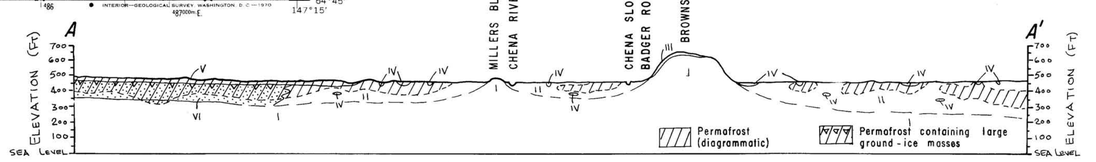
Sample site

SELECTED SUBSURFACE DATA[1]

Selected data from borehole and well logs are presented below. Numbered items correspond to numbered circles on map. An asterisk (*) indicates that permafrost persisted to bottom of hole.

*1. 0-50.5 ft organic silt. Did not reach bedrock. Permafrost 3.5-50.5 ft.
*2. 0-2 ft organic material, 2-5 ft silt, 5-12 ft ice, 12-23 ft silt, 23-32 ft organic sand. Did not reach bedrock. Permafrost 1-32 ft.
*3. 0-1 ft organic material, 1-20 ft silty sand, 20-37 ft sandy silt. Did not reach bedrock. Permafrost 1.5-37 ft.
4. 0-3.5 ft silt, 3.5-22.5 ft sandy silt. Did not reach bedrock. No permafrost.
*5. 0-10 ft peat, 10-25 ft silt. Did not reach bedrock. Permafrost 1-25 ft.
*6. 0-11 ft silt, 11-16 ft peat, 16-32.5 ft silt. Did not reach bedrock. Permafrost 5-32.5 ft.
*7. 0-2 ft peat, 2-17.5 ft silt. Did not reach bedrock. Permafrost 1-17.5 ft.
8. 0-6 ft silt, 6-27.5 ft sand. Did not reach bedrock. No permafrost.
*9. 0-6 ft peat, 6-14 ft ice, 14-20 ft silt, 20-27.5 ft silty sand. Did not reach bedrock. Permafrost 1-27.5 ft.
*10. 0-8 ft silt, 8-10 ft peat, 10-12 ft silt. Did not reach bedrock. Permafrost 2-12 ft.
*11. 0-7 ft interbedded silt, sand and organic silt. Did not reach bedrock. Permafrost at 7 ft.
*12. 0-2.5 ft silt. Did not reach bedrock. Permafrost at 2.5 ft.
13. 0-1.5 ft peat, 1.5-5 ft silt. Did not reach bedrock. No permafrost.
14. 0-4 ft interbedded silt and peat. Did not reach bedrock. No permafrost.
15. 0-1 ft silty peat, 1-6 ft interbedded silt and peaty silt. Did not reach bedrock. No permafrost.
*16. 0-5.5 ft silt, 5.5-8 ft sand, 8-18 ft sandy gravel. Did not reach bedrock. Permafrost 2-18 ft.
17. 0-1 ft organic material, 1-13 ft sand. Did not reach bedrock. No permafrost.
*18. 0-7 ft silt, 7-12.5 ft gravel. Did not reach bedrock. Permafrost 2-12.5 ft.
19. 0-13 ft silt, 13-17.5 ft gravel. Did not reach bedrock. No permafrost.
20. 0-8 ft silty sand, 8-13 ft sand, 13-40 ft sandy gravel. Did not reach bedrock. No permafrost.
*21. 0-14 ft silt. Did not reach bedrock. Permafrost at 14 ft.
*22. 0-4 ft silt. Did not reach bedrock. Permafrost at 4 ft.
23. 0-1.5 ft silt, 1.5-3.5 ft sandy silt, 3.5-4.5 ft sand. Did not reach bedrock. No permafrost.
24. 0-2 ft silt, 2-127 ft river sand and gravel. Did not reach bedrock. Permafrost 2-122 ft.
25. 0-5 ft organic silt, 5-13 ft silty sand, 13-40 ft sandy gravel. Did not reach bedrock. Permafrost 2-16 ft.
26. 0-6 ft fill, 6-8 ft silt, 8-13 ft river gravel. Did not reach bedrock. No permafrost.
27. 0-4 ft silt, 4-7 ft gravel, 7-9.5 ft sand, 9.5-12.5 ft gravel. Did not reach bedrock. No permafrost.
28. 0-2 ft peat, 2-30 ft river sand and gravel. Did not reach bedrock. No permafrost.
*29. 0-3 ft sandy silt, 3-5.5 ft silt, 5.5-50 ft sandy gravel. Did not reach bedrock. Permafrost 2-22; 31-50 ft.
*30. 0-9 ft silt, 9-12 ft silty sand, 12-50 ft gravelly sand. Did not reach bedrock. Permafrost 9-50 ft.
*31. 0-6 ft sandy silt, 6-40 ft gravelly sand. Did not reach bedrock. Permafrost 3-6; 32-40 ft.
32. 0-1 ft silt, 1-10 ft gravelly sand. Did not reach bedrock. No permafrost.
*33. 0-4 ft silt, 4-15 ft gravelly sand. Did not reach bedrock. Permafrost 7-15 ft.
34. 0-18 ft gravelly sand. Did not reach bedrock. No permafrost.
*35. 0-6 ft silt, 6-14 ft sandy gravel. Did not reach bedrock. Permafrost 7-14 ft.
36. 0-1 ft gravelly sand, 1-3 ft silty sand, 3-8 ft sandy gravel. Did not reach bedrock. No permafrost.
37. 0-1 ft peat, 1-2 ft sandy silt, 2-5 ft silt, 5-14 ft silty, sandy gravel. Did not reach bedrock. Permafrost 1-13 ft.
38. 0-170 ft river sand and gravel. Did not reach bedrock. No permafrost.
39. 0-5.5 ft sandy silt, 5.5-7 ft silty, sandy gravel. Did not reach bedrock. No permafrost.
*40. 0-265 ft river sand and gravel. Did not reach bedrock. Permafrost 3-265 ft.
41. 0-6 ft silt, 6-23.1 ft gravelly sand. Did not reach bedrock. No permafrost.
*42. 0-10 ft gravelly sand. Did not reach bedrock. Permafrost 5-10 ft.
43. 0-1 ft silt, 1-27 ft gravelly sand. Did not reach bedrock. No permafrost.
*44. 0-1 ft silt, 1-5 ft gravelly sand, 5-12 ft sandy gravel. Did not reach bedrock. Permafrost 3.5-12 ft.
45. 0-2 ft sandy silt, 2-4 ft silt, 4-8 ft silty, gravelly sand. Did not reach bedrock. No permafrost.
46. 0-5 ft silt, 5-105 ft river sand and gravel. Did not reach bedrock. No permafrost (?).

[1] Selected subsurface data were obtained from Williams, Péwé, and Paige (1959); R&M Engineering and Geological Consultants; State of Alaska Department of Highways; Department of the Army, North Pacific Division, U.S. Army Engineer District, Alaska; local well drillers and residents.



GENERALIZED CROSS SECTION
VERTICAL EXAGGERATION X4

2000 1000 0 2000 4000 6000 FEET

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1970

For sale by U.S. Geological Survey, price $1.00

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