



- I BEDROCK**
Igneous and metamorphic bedrock, exposed primarily on hillsides and steep slopes where cover is less than 3 feet thick, underlies surficial deposits in all the quadrangle. Upper part is weathered, where permafrost present, ice content is low or absent but may be higher in weathered bedrock. No subsidence upon thawing; weathered bedrock 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 hillsides, 3 to more than 200 feet thick. No mapped where less than 3 feet thick. Generally free of permafrost; reflecting slopes may contain permafrost with little or no ice content. Mildly susceptible to unconsolidated to seasonal frost action. High bearing strength when dry and in original position; very low when wet. Silt may undergo moderate to intense frost action, but sand and gravel will undergo none. High bearing strength when frozen or dry; low when wet or thawed where not well drained.
- IV ALLUVIAL-FAN SILT**
Alluvial-fan silt overlying flood-plain and gravel; thickness as much as 50 feet. Discontinuous permafrost with moderate to low ice content primarily as pore ice but may contain ice seams and lenses. Silt may undergo moderate to intense subsidence upon thawing. Seasonal frost action moderate to intense. High bearing strength when frozen or dry; low when wet or thawed where not well drained.
- V RIVER SILT**
River silt in broad, basinlike areas and elongate, sinuous mender 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. Heavy 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.
- VI 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 VII, which has high ice content as seams, lenses, and large foliated ice masses. Ice content may be low and permafrost sporadic near unfrozen loose zone uplope. 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.
- VII PEAT MUCK**
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. Where peat muck overlies by less unit, both deposits mapped as muck (unit VI).

- SYMBOLS**
- Contact
- Generally indefinite or gradational
- Gravel pit
- Site of subsurface data
- Sample site

- SELECTED SUBSURFACE DATA¹**
- Selected data from borehole and well logs are presented below. Numbered items correspond to numbered circles on map. An asterisk (*) indicates that permafrost was struck to bottom of hole.
1. 0-10 ft loess, 10-225 ft siltst. No permafrost.
 2. 0-40 ft loess, 60-150 ft siltst. No permafrost.
 3. 0-30 ft loess, 140-170 ft bedrock. No permafrost.
 4. 0-80 ft silt, 80-91 ft weathered bedrock. Permafrost 2-47 ft.
 5. 0-142 ft silt, 142-170 ft siltst. No permafrost recorded.
 6. 0-25 ft silt. Did not reach bedrock. Permafrost 6-7; 22-24 ft.
 7. 23 ft silt. Did not reach bedrock. Permafrost 13-23 ft.
 8. 0-90 ft loess, 90-248 siltst. No permafrost.
 9. 23 ft silt. Did not reach bedrock. Permafrost 1.5-21 ft.
 - *10. 0-8 ft silt. Did not reach bedrock. Permafrost 2-8 ft.
 11. 0-200 ft river sand and gravel. Did not reach bedrock. Permafrost 4-114 ft.
 12. 0-154 ft river sand and gravel. Did not reach bedrock. Permafrost 38-152 ft.
 13. 0-370 ft river sand and gravel. Did not reach bedrock. Permafrost 3-58 ft.
 14. 0-115 ft river sand and gravel. Did not reach bedrock. Permafrost 2-115 ft.
 15. 0-64 ft river sand and gravel. 150-228 ft weathered bedrock. Permafrost 10-80.6 ft.
 16. 0-82 ft river sand and gravel. Did not reach bedrock. Permafrost 6-78 ft.
 17. 0-101 ft river sand and gravel. Did not reach bedrock. Permafrost 9-101 ft.
 18. 0-61 ft river sand and gravel. Did not reach bedrock. Permafrost 3-58 ft.
 19. 0-65 ft river sand and gravel. Did not reach bedrock. Permafrost 13-30 ft.
 20. 0-34 ft river sand and gravel. Did not reach bedrock. Permafrost 28-90; 105-115; 119-128; 144-166; 175-180 ft.
 21. 0-312 ft river sand and gravel. Did not reach bedrock. Permafrost 12-32 ft.
 22. 0-15 ft river sand and gravel. Did not reach bedrock. Permafrost 35-70 ft.
 - *23. 0-2 ft silt, 2-15 ft river sand and gravel. Did not reach bedrock. Permafrost at 15 ft.
 24. 0-56 ft river sand and gravel. Did not reach bedrock. No permafrost.
 25. 0-65 ft river sand and gravel. Did not reach bedrock. Permafrost 15-55 ft.
 26. 0-84 ft river sand and gravel. Did not reach bedrock. Permafrost 46-40 ft.
 27. 0-126 ft river sand and gravel. Did not reach bedrock. Permafrost 27-116 ft.
 28. 0-110 ft river sand and gravel. Did not reach bedrock. Permafrost 15-50 ft.
 29. 0-110 ft river sand and gravel. Did not reach bedrock. Permafrost 18-38 ft.
 30. 0-179 ft river sand and gravel. Did not reach bedrock. Permafrost 29-155 ft.
 - *31. 0-177 ft river sand and gravel. Did not reach bedrock. Permafrost 4-177 ft.
 32. 0-119 ft river sand and gravel. Did not reach bedrock. Permafrost 21-71; 80-86; 91-104 ft.
 33. 0-110 ft river sand and gravel. Did not reach bedrock. Permafrost 38-80 ft.
 34. 0-23 ft river sand and gravel. Did not reach bedrock. Permafrost 4-12 ft.
 35. 0-172 ft river sand and gravel. Did not reach bedrock. Permafrost 101-152 ft.
 36. 0-88 ft river sand and gravel. Did not reach bedrock. Permafrost 10-62 ft.
 37. 0-180 ft river sand and gravel. Did not reach bedrock. Permafrost 14-82 ft.
 38. 0-112 ft river sand and gravel. Did not reach bedrock. No permafrost.
 39. 0-180 ft river sand and gravel. Did not reach bedrock. Permafrost 14-82 ft.
 40. 0-312 ft river sand and gravel. Did not reach bedrock. No permafrost.
 41. 0-80 ft river sand and gravel. Did not reach bedrock. Permafrost 101-147 ft.
 42. 0-315 ft river sand and gravel. Did not reach bedrock. Permafrost 4-36 ft.
 43. 0-105(17) ft river sand and gravel. Did not reach bedrock. No permafrost.
 44. 0-27 ft river sand and gravel. Did not reach bedrock. Permafrost 4-23 ft.
 45. 0-140 ft river sand and gravel. Did not reach bedrock. Permafrost 24-42 ft.
 46. 0-160 ft river sand and gravel. Did not reach bedrock. No permafrost.
 47. 0-106 ft river sand and gravel. Did not reach bedrock. Permafrost 13-35; 43-47; 65-73 ft.
 48. 0-205 ft river sand and gravel. Did not reach bedrock. Permafrost 14-82 ft.
 49. 0-100 ft river sand and gravel. Did not reach bedrock. No permafrost.
 50. 0-113 ft river sand and gravel. Did not reach bedrock. Permafrost 107-105 ft.
 51. 0-170 ft river sand and gravel. Did not reach bedrock. Permafrost 13-34 ft.
 52. 0-182 ft river sand and gravel. Did not reach bedrock. Permafrost 22-182 ft.
 53. 0-170 ft river sand and gravel. Did not reach bedrock. Permafrost 20-178 ft.
 54. 0-243 ft river sand and gravel. Did not reach bedrock. Permafrost 18-243 ft.
 55. 0-249 ft river sand and gravel. Did not reach bedrock. Permafrost 11-238 ft.
 56. 0-15 ft river sand and gravel. Did not reach bedrock. Permafrost 15 ft.
 57. 0-19 ft river sand and gravel. Did not reach bedrock. No permafrost.
 58. 0-2 ft silt, 2-19 ft river sand and gravel. Did not reach bedrock. No permafrost.
 59. 0-15 ft river sand and gravel. Did not reach bedrock. Permafrost 15 ft.
 60. 0-19 ft river sand and gravel. Did not reach bedrock. No permafrost.
 61. 0-13 ft silt, 13-22 ft river sand and gravel. Did not reach bedrock. No permafrost.
 62. 0-19 ft silt, 2-8 ft silt, 8-27 ft river sand and gravel. Did not reach bedrock. No permafrost.
 63. 0-307 ft river sand and gravel. Did not reach bedrock. Permafrost 20-70 ft.
 64. 0-7 ft river sand and gravel. Did not reach bedrock. No permafrost.
 65. 0-15 ft silt, 15-72 ft river sand and gravel. Did not reach bedrock. Permafrost 5-18 ft.
 66. 0-15 ft river sand and gravel. Did not reach bedrock. No permafrost.
 67. 0-20 ft river sand and gravel. Did not reach bedrock. Permafrost 4-17 ft.
 68. 0-4 ft silt, 4-20 ft river sand and gravel. Did not reach bedrock. No permafrost.
 69. 0-7 ft silt, 7-20 ft river sand and gravel. Did not reach bedrock. No permafrost.
 - *70. 0-4 ft silt, 4-18 ft river sand and gravel. Did not reach bedrock. Permafrost 5-18 ft.

BASE BY U.S. GEOLOGICAL SURVEY, 1966

SCALE 1:75,000

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

**MAP SHOWING FOUNDATION CONDITIONS
IN THE FAIRBANKS D 2 SE QUADRANGLE, ALASKA**

BY
TROY L. PEWE AND JOHN W. BELL
1975

