

**SURFICIAL GEOLOGY OF NORTHEAST TACOMA,  
PIERCE COUNTY, WASHINGTON**

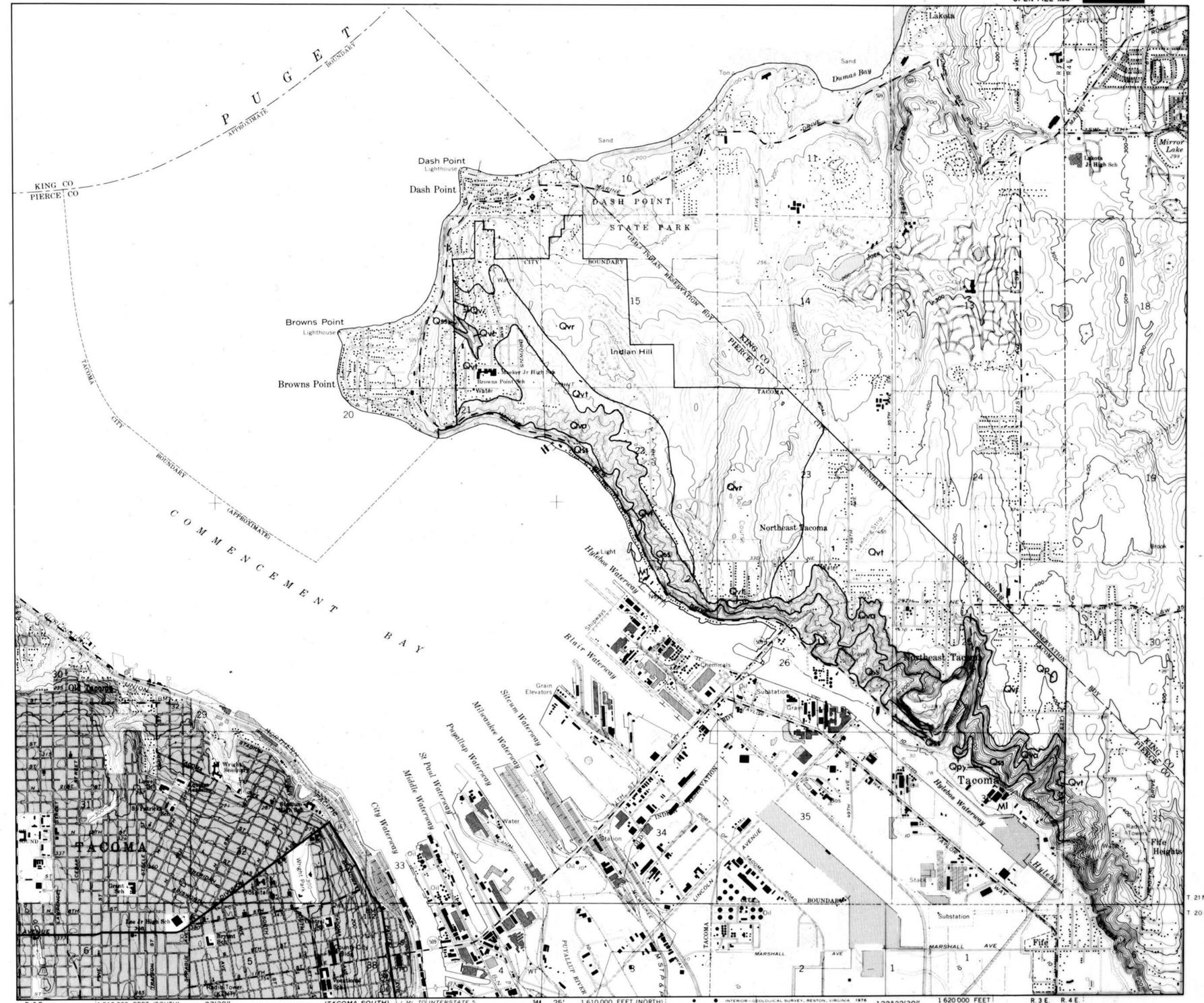
by  
**Mackey Smith**  
1976

**EXPLANATION**

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| <p><b>ML</b><br/>Modified land</p> <p>Original topography disturbed by removal of some Pleistocene and recent deposits, grading, and artificial fill of unknown quality.</p> <p><b>Qp</b><br/>Peat</p> <p>Accumulations of organic material. May contain small amounts of sand, silt, clay, and volcanic ash deposited in swamps and bogs.</p> <p><b>Qvr</b><br/>Vashon recessional outwash</p> <p>Light brown, loosely compacted sand and gravel. Sorting varies; particle size varies from fine sand to cobbles. Stones are usually covered with a light-brown dusty coating and are well rounded from stream transportation.</p> <p><b>Qvt</b><br/>Vashon till</p> <p>Poorly sorted, nonstratified lodgment till deposited as ground moraine. Mixture of clay, silt, sand, pebbles, and cobbles with occasional large boulders. Appears gray to blue on fresh surface; may weather to brown or yellow. Extremely compact, will stand in near vertical cliffs; generally lacks surficial cracks or joints. Stones are subangular to rounded. Some larger clasts show striations and faceting. Some areas of Qvt are covered by a thin veneer of loosely consolidated, nonsorted ablation till and/or thin outwash.</p> | <p><b>Qva</b><br/>Vashon advance outwash</p> <p>Light-gray, stratified, compact sand and gravel. Sorting varies; particle size varies from fine sand to coarse pebbles. Stones are well-rounded and not weathered.</p> <p><b>Qss</b><br/>Salmon Springs Drift</p> <p>Mostly sand and gravel with some lenses of silt, clay, and till. Color varies from orange to gray. Sorting of glaciofluvial deposits varies; sand particle size varies from medium to coarse. Gravel particle size varies from pebble to cobble. Stones are usually covered with iron oxide stain. Small zones of openwork gravel show dark-brown manganese oxide stain and have a high clay matrix. Granites are frequently disintegrated completely through. Some volcanic rocks are badly weathered and decomposed. Sands exhibit cross bedding, and frequently have channels incised and filled with gravel. Till is very compact and varies from gray to oxidized orange. Silts are light gray to light brown and often contain a large amount of volcanic ash.</p> <p><b>Qpy</b><br/>Puyallup Formation</p> <p>Generally medium bedded (2 to 4 feet) sand, silt, and clay. Color varies from light brown to gray. Particle size varies from clay to coarse sand. Sorting is generally good within each individual bed. Clay and silt beds can be as thin as 2 inches. Usually well compacted; deposited in nonglacial river flood plains.</p> |
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- Contact includes known, approximate, and concealed

**ENGINEERING PROPERTIES OF MAP UNITS**

UNIT	EASE OF EXCAVATION	FOUNDATION STABILITY	SLOPE STABILITY	DRAINAGE	SUITABILITY AS COARSE AGGREGATE	POTENTIAL USE
Qp Peat	Generally easy	Poor, extremely compressible	Not found on slopes	Poor	Poor	Quantity insufficient for practical use
ML Modified land	Variable, easy in areas of dredged fill	Highly variable, may be extremely compressible in filled areas	Highly variable, generally good in existing gravel pits	Variable, generally poor in areas of low slope	Varies from good in some gravel pits to poor in areas of dredged fill	-----
Qvr Vashon recessional outwash	Generally easy	Generally good, in areas of low slope slightly compressible	Unstable on slopes exceeding 30 degrees	Variable	Good in areas of gravel, poor in areas of sand	Aggregate or fill
Qvt Vashon till	Very difficult	Excellent	Excellent in natural slopes. May spall off as large blocks in vertical cuts	Low infiltration, low permeability, runoff good on slopes	Poor	Fill
Qva Vashon advance outwash	Generally easy	Generally good. Decreases as slope reaches angle of repose	Good	Variable	Good	Aggregate or fill
Qss Salmon Springs Drift	Variable, generally difficult	Excellent, decreases slightly as slope reaches angle of repose	Excellent, stands in near vertical cliffs, will spall as blocks or individual stones with wetting and drying or freezing and thawing	Variable, generally good as drift is exposed mostly on steep slopes	Poor, oxidation coating and weathered condition of stones is undesirable property for concrete aggregate	Fill
Qpy Puyallup Formation	Variable, mostly well compacted making excavation difficult	Variable, generally poor in hillslopes	Variable, probably poor when subjected to high building loads	Good in hillslopes	Poor	Fill



Geology east from 35th Ave. S.W. modified from Waldron, H.H., 1964, Geology of the Poverty Bay quadrangle, Washington, U.S. Geological Survey, Geological Quadrangle Map GQ-158. Geology west from 35th Ave. S.W. by Mackey Smith, 1976, assisted by J.W. Ward.

SCALE 1:24,000

CONTOUR INTERVAL 20 FEET  
DOTTED LINES REPRESENT 10-FOOT CONTOURS  
NATIONAL GEODETIC VERTICAL DATUM OF 1929  
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOWER LOW WATER  
SHORELINE SHOWN REPRESENTS 1:10 APPROXIMATE LINE OF MEAN HIGH WATER  
THE MEAN RANGE OF TIDE IS APPROXIMATELY 6 FEET

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty - - - - - Unimproved dirt - - - - -  
○ Interstate Route ○ U.S. Route ○ State Route

Base map: portions of Tacoma North and Poverty Bay U.S. Geological Survey 7.5 quadrangles.