EXPLANATION OF LIQUEFACTION POTENTIAL ZONES

ZONE	LIQUEFACTION SUSCEPTIBILITY	GEOLOGIC UNIT	WATER TABLE (FEET)	PERCENT OF SPT N-VALUES[1] BELOW THRESHOLD CRITERION	PERCENT OF BORINGS[1] WITH 10 FEET OF LIQUEFACTION (THICKNESS CRITERION)	REMARKS
	High	Fill–Duwamish Tideflats, interbay	High (<10)	>50	>50	Typical liquefaction depths of 20–30 ft (6.1–9.1 m) for *M* 7.5 event. Locally very high hazard within 200 ft (60 m) of open bodies of water.
	Moderate	Holocene alluvium, Holocene beach	High (<10–15)	25–50	25–50	Typical liquefaction depths of 10–20 ft (3.0–6.1 m) for *M* 7.5 event. Locally high hazard within 200 ft (60 m) of open bodies of water. Beach deposits have low to moderate liquefaction potential.
	Low	Pleistocene alluvium	Variable/perched (10–40)	10–25	<25	Generally high SPT N-values combined with low ground water, which results in low potential.
	Very low	Pleistocene glacially consolidated sediments and bedrock	Variable/perched (10–40)	<10	Not evaluated	Liquefaction unlikely due to material composition (includes clays) and high density.

[1]Based on a threshold earthquake with a 475-year return interval (peak ground acceleration=0.30 g; *M*=7.5).

DESCRIPTION OF MAP UNITS

- f, m — **Artificial fill, f, and modified land, m (Modern)**—Modified land, areas leveled by cut and fill
- Qa — **Alluvium (Holocene)**—Chiefly sand and silt but includes clay and peat. South of Renton and Tukwila these sediments are 15–25 ft (4.6–7.6 m) thick and overlie sand and gravel; mostly sand and gravel in Cedar River valley
- Qb — **Beach deposits (Holocene)**—Chiefly sand; may include interbedded organic material; deposits in places are veneers of sand and gravel less than 2 ft (0.6 m) thick on older deposits
- Qp — **Peat (Holocene)**
- Ql — **Landslide deposits (Holocene)**—Only most prominent slides in south half of map area and west of Lake Washington are shown. All Pleistocene deposits are susceptible to sliding where they crop out in steep slopes; least stable deposit is Qc; most stable is Qt
- Qsc — **Lacustrine sediments (Pleistocene)**—Chiefly unconsolidated silt, clay, and fine sand generally less than 10 ft (3 m) thick

Vashon Drift (Pleistocene)

- Qys — **Younger sand**—Sand, fine to medium, loose; generally overlies Qt; contains minor amounts of gravel, mostly less than 20 ft (6 m) thick
- Qyg — **Younger gravel**—Chiefly sand and pebble gravel; commonly overlies Qt; as much as 100 ft (30 m) thick
- Qt — **Vashon till**—Compact, concrete-like mixture of silt, sand, gravel, and clay; as much as 150 ft (45 m) thick, but generally less than 50 ft (15 m); upper 2–5 ft (0.6–1.5 m) generally a loose, silty sand and gravel
- Qog — **Older gravel**—Chiefly sand and pebble gravel; lies beneath Qt; as much as 200 ft (60 m) thick
- Qos — **Older sand (Pleistocene)**—Chiefly medium sand; loose; as much as 300 ft (90 m) thick
- Qc < Qcg — **Older clay, till, and gravel (Pleistocene)**—Silt, clay, fine sand, and till, very compact; locally includes lenticular sand and gravel shown as Qcg where mappable
- Qu — **Undifferentiated deposits of Pleistocene age**
- Tb — **Blakely Formation (Oligocene)**—Chiefly tuffaceous sandstone and conglomerate; compact but poorly cemented; at least 2,500 ft (760 m) thick
- Td — **Sedimentary rocks (middle Eocene)**—Conglomerate, sandstone, siltstone, and shale; partly of marine origin; consists chiefly of volcanic rock fragments

Contact—Dashed where approximately located; short dashed where indefinite or inferred

Fault—Showing relative movement; U, upthrown side; D, downthrown side

Strike and dip of beds

CONVERSION FACTORS

Multiply	By	To obtain
centimeters (cm)	0.3937	inches (in.)
meters (m)	3.281	feet (ft)
kilometers (km)	0.6214	miles (mi)

Base from U.S. Geological Survey
Bellevue North, 1982; Bellevue South,
Seattle North; Seattle South, 1983
Projection and 1000-meter grid, zone 10,
Universal Transverse Mercator
10,000-foot grid ticks based on Washington
coordinate system, north zone
1927 North American Datum

SCALE 1:25 000

CONTOUR INTERVAL 5 METERS
WITH SUPPLEMENTARY CONTOURS AT 2.5 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
BATHYMETRIC CONTOUR INTERVAL 2 METERS WITH SUPPLEMENTARY 1 METER CONTOURS

MAP SHOWING LIQUEFACTION POTENTIAL IN SEATTLE, WASHINGTON

By
W. Paul Grant, William J. Perkins, and T. Leslie Youd

1998

U.S. GOVERNMENT PRINTING OFFICE 1998–773-076