

***Preliminary Evaluations of
Landslides for Seattle Department
of Parks and Recreation
Seattle, Washington***

May 1997

APPENDIX A

APPENDIX B

APPENDIX C

APPENDIX D

With respect to the Duwamish Head area, additional instability could occur in the future. Property owners should obtain geotechnical advice regarding precautions to reduce the risk to properties. In addition, we recommend that all existing and future drainage systems in the vicinity be evaluated for proper functioning on a regular schedule; annually at a minimum.

6.0 LANDSLIDES AT KINNEAR PARK

The locations of landslides that were observed at Kinnear Park are shown on the Kinnear Park Site Plan, Figure B-1, Appendix B. Site reconnaissance visits were made on March 19, 20, and 25, 1997.

At location designated A on Figure B-1, 1/4-inch cracks were observed on the trail at that location. Glacial till was identified on the slope adjacent to the trail. At location B, 2-foot-thick skin slides had recently occurred in a bowl-shaped area. Movement at the top of the slope took place, as well as sliding of colluvium on the slope; refer to Profile Sketch B-B, Figure B-2. To the west of location B, a small slough and run of soil was noted at location C. At location D, a very small mud flow was mapped. In our opinion, these were all natural occurrences and such processes will continue to occur in the future in this area. There is no practical remedial measure that can be taken to prevent this.

At location E, an old skin slide area was observed. It appeared to have been about 1 to 2 feet in thickness. It was now grown over with willows and numerous small ferns. According to the owner of the property at the toe of this hillside, this previous slide occurred about two years ago.

The landslide at location F occurred on March 20, 1997, following the March 18 and 19 rainstorm. The area near the top of the slope set down about 10 feet, and soils on the steep slope (colluvium about 3 feet thick) below the setdown area moved downhill. Soil and debris (numerous trees) came down the slope to the area at the bottom of the slope.

Based on our reconnaissance of this slide denoted F on Figure B-1, we identified the layering of soils on the slope. Beginning at the top, the uppermost 5 feet consisted of silty gravelly sand. From 5 to 20 feet below the top, glacial till was observed, underlain by a

5-foot-thick layer of broken clay with groundwater seepage. Below 25 feet, dense sand or sand and gravel were observed in the slide scar.

Near the top of the slope at location F, three blocks of soil were observed to remain precariously on the slope. Each of these blocks contained a number of trees. There was one block on the north side of this slide area, and two on the south. The block to the north had about six trees, 4 to 6 inches in trunk diameter, and several 2- to 4-inch-diameter trees. We estimated this block to be 50 to 75 cubic yards. To the south, the uphill block (about 50 cubic yards) had about 10 trees, 2 to 4 inches in trunk diameter. The downhill block to the south was estimated to be about 100 cubic yards in size, with several 4- to 6-inch trees. Our conclusion on March 20, was that any of these blocks could slide down the hill with additional heavy rainfall. This conclusion was made known to Kevin Stoops, Project Manager for the Park Department.

Based on the possibility that the blocks could slide down the hill, the decision was made by the Parks Department to cut the trees on these blocks, since trees could possibly cause more damage below than just the soil. At a meeting at the site, we pointed out to Park Department personnel those trees that should be cut, leaving the stumps in the ground. We understand that these trees have been cut.

The slide at location G apparently occurred mid-December 1996. A profile sketch C-C' through this slide is presented on Figure B-2. As shown by the profile, the slide headscarp (about 10 to 12 feet high) was observed to contain jointed till soil. Underlying the jointed till, we observed sand with silt and clay layers, with groundwater seepage from the sand layers. The slide had deposited soil and debris (numerous trees) in the lower portion of the slope.

The slide at location H occurred on Sunday, March 23, 1997, between 1 and 5 a.m. This was a skin slide involving about 1 to 3 feet of weathered soil located in the upper portion of the slope. This soil sloughed off the steep slope (about 46 degrees with the horizontal was measured) and deposited soil and woody debris in the lower portion of the slope. The soil in the debris deposit, when observed on March 25, 1997, did not appear wet. This slide at location H is connected at the top with an old skin slide that extends over to slide area denoted G. The ground between these two slides could fail during future heavy rains.

