



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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MEMORANDUM

August 9, 1999

TO: Tom Luster

FROM: Jerald LaVassar, M.S., P.E.

SUBJECT: Evaluation of Retaining Wall/Slope Alternatives to Reduce Impacts to Miller Creek, Embankment Station 174+00 to 186+00

You have asked that I review the above named report for the Third Runway at Sea-Tac International Airport. In particular, you were concerned that adverse foundation conditions might be encountered during construction that would prompt a request to disturb additional wetlands from those mapped in this proposal. You wished my opinion whether construction techniques existed to deal with such unanticipated foundation conditions and still restrict the disturbed area to the current proposed footprint. The short answer is yes, there are such techniques. These techniques generally are expensive and typically require a specialty contractor.

My foregoing comments are based on limited site specific data. The report did not provide detailed logs of the foundation explorations along the wall alignment. I am relying on the Site Description section of the report on page 1-1 where it notes the presence of "very dense glacially overridden soils at depths on the order of 10 to 30 feet." Clearly, the considerable height of the wall dictates that it be founded on a dense, unyielding foundation or a structural fill that spans between such a stratum and the base of the wall. Obviously, a conventional sloped excavation 30 feet or more in depth likely would extend the area of wetlands disturbance beyond the permitted footprint. Thus, it could prove necessary to provide a near vertical wall for the creek side of the excavation. The schemes to do this include tied-back walls, a row of bored piles, soil nailing, even ground freezing as possible alternatives. Certainly, these schemes carry a substantial cost, but they should allow the construction to comply with the proposed restrictions on the extent of disturbed wetlands. All parties should recognize that the cost per foot of treated wall may be high but, the length of the wall foundation where such measures may be necessary is likely to be only a small fraction of the wall's length.

In general, I believe the project proponents have proposed a suitable conceptual level scheme to construct a mechanically stabilized earth wall. The individuals identified to

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conduct subsequent static and dynamic analysis of the wall and of the detailing of the stabilization system are acknowledged experts in their respective fields. Thus, there is every reason to assume that the construction plans will comply with good engineering practice. None the less, the steps noted in the peer review comments of Shannon & Wilson, Inc. on the mechanically stabilized earth wall are prudent and I hope incorporated in the design and construction. All parties should recognize that a wall of this height is rare. Thus, the inclusion of various monitoring devices in the wall and backfill would provide valuable confirmation that the wall is deflecting and performing in the manner anticipated by the designers both during construction and over a long and protracted service life.

If you have any further questions, please do not hesitate to contact me.

JL:jl

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