MEMORANDUM

Project No. 170361

July 30, 2024

To: Darren Sandedo / Parametrix

cc: Satya Dhital / Herrera Environmental Consultants

From:

7/30/2024

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Re: **Geotechnical Engineering Addendum**
Silverdale Recycling and Garbage Facility (RAGF)

Since 2017, Aspect Consulting, a Geosyntec company (Aspect) has provided geotechnical engineering support to Parametrix and the Kitsap County Solid Waste Division on the Silverdale Recycling and Garbage Facility (RAGF) project. We submitted our Final Geotechnical Engineering Report[1] for the project in 2023.

In June 2024, Aspect was requested to provide geotechnical engineering input to specific elements of final design for two elements of the RAGF project that were not discussed in our final geotechnical engineering report. These elements are:

1. **Koch Pond Fill Berm.** The east stormwater pond, Koch Pond, will have a fill berm along its eastern side. The design team requested a geotechnical engineering evaluation of fill berm stability and input on the berm design.

[1] Aspect Consulting, LLC (Aspect), Updated Geotechnical Engineering Report, Silverdale Recycling and Garbage Facility, 8843 Dickey Road NW, Silverdale, Washington, 98383, prepared for Parametrix, January 24.

2. **Dickey Road NW Frontage.** Frontage improvements are planned along the south side of Dickey Road NW. This will include an asphalt overlay for the entire south (eastbound) lane, concrete sidewalks, curbs, gutters, and new 12-inch-diameter stormwater pipe.

Refer to our final geotechnical engineering report for background information about the RAGF project and a description of the Site's geotechnical characteristics. This memorandum serves as an addendum to our report, providing a description of the two proposed elements and our geotechnical engineering conclusions and recommendations for each.

Koch Pond Fill Berm

Description and Understanding

Aspect was provided with 14 plan sheets (C40.01 through C40.12 and L20.01-L20.02) prepared by Herrera Environmental Consultants (Herrera) dated July 2024, which are part of a 100 percent submittal. These plans show Koch Pond will have a smaller, northern pre-settling area, and a larger, central-to-southern water quality detention area. Stormwater will slowly move from north to south and drain to an engineered outfall that will disperse the water in forested land to the southeast. Existing topography in this area slopes down to the east. The western side of Koch Pond will generally be a cut into existing native glacial till, and the eastern side of Koch Pond will be a constructed fill berm.

The smaller, northern pre-settling area will be an enclosed area, with the bottom at Elevation 387[2] and top at Elevation 391. Stormwater will enter the smaller pre-settling area, and when it fills the enclosed area up to Elevation 391, it will then flow south into the larger central-southern area. The central-southern area will have a bottom Elevation 389.5, and will be enclosed with a top of berm at Elevation 396. Detained stormwater will flow out of the detention pond into a control structure on the south side, and will be released to an engineered outfall that will disperse onto undeveloped vegetated sloping ground between the pond and Dickey Road NW.

A fill berm is required along the east side of this combined pond. With the planned top Elevation 396 and existing ground under the berm footprint varying typically from Elevation 390 to 385, the berm will vary in thickness from 6 to 12 feet, with a typical average height of 10 feet. Per Herrera's plan sheets, the interior sideslope of this berm will be inclined at 3H:1V (horizontal:vertical), and the exterior sideslope will be inclined at 2H:1V. The entire length of the fill berm will have a key dug down to Elevation 382, with a 6-foot-wide bench in the east-west, or transverse-to-berm, direction.

Per Herrera's plan sheets, the design 100-year water surface elevation in the pond will be Elevation 395 feet (100-year water depth of 5.5 feet). An emergency spillway on the south end of the pond will let flood water out before exceeding Elevation 396 feet (maximum water depth of 6.5 feet).

Fill Berm Conclusions

Aspect reviewed the Herrera-proposed berm geometry and subsurface conditions in test pits ATP-09 through ATP-13 in Koch Pond. The test pits reveal that below a thin veneer of existing topsoil, and limited undocumented old fill in some spots, native glacial till underlies this area.

[2] All elevations are per project datum.

Aspect also reviewed the proposed berm geometry stability and seepage. We conclude that the berm will be sufficiently stable as designed, providing it is constructed with on-Site low-permeability till-fill that is prepared, placed, and compacted per the following recommendations.

Fill Berm Construction Recommendations

Subgrade preparation for the berm should include removal of all existing vegetation, topsoil, and any old fill across the entire berm footprint, including sideslopes. The keyway excavation should be approved by the Owner's geotechnical inspector. It may be acceptable to reduce the required depth of the keyway excavation by a few feet, pending suitable subgrade conditions to be determined during construction.

Berm fill material may consist of native glacial till excavated from the central part of the pond area, processed and prepared as follows:

1. Surficial topsoil, stumps, other deleterious material should be stripped and removed. Large cobbles and any boulders should selectively be removed.

2. The in-place and undisturbed native glacial till material has a high silt and clay content and will be extremely moisture sensitive when exposed to rainfall. The material should be excavated only during dry weather months of July through October, and work should stop during wet weather.

3. Segregated till that has been approved by the Owner's geotechnical inspector for reuse as berm fill should be placed promptly, and only during dry weather conditions. The material may need to be sprinkled (moisture-conditioned) to bring its moisture content up toward optimum during placement.

4. Approved segregated till material that is not promptly replaced as berm fill should be stockpiled and covered with heavy plastic sheeting to prevent the material from taking on excessive moisture during any summer rain events.

5. The approved till-fill material, while at or near its optimum moisture content, should be placed in 12-inch-thick maximum loose lifts and compacted with a large, heavy steel drum vibratory compactor. The entire thickness and extend of the fill berm shall be compacted to at least 95 percent relative compaction per the requirements stipulated in Section 2-03.3(14)C, Method C, of the Washington State Department of Transportation (WSDOT) Standard Specifications[3] (WSDOT, 2024). The Owner's geotechnical inspector should perform in-place density testing to verify soil moisture content and compaction meet this requirement.

6. In order to achieve the required compaction levels on the berm sideslopes, it will be necessary to over-build the slopes and then trim them back to the final 2H:1V (outside) and 3H:1V (inside) configurations.

[3] Washington State Department of Transportation (WSDOT), 2024, Standard Specifications for Road, Bridge and Municipal Construction, Document M 41-10.

Dickey Drive NW Frontage Improvements

Description and Understanding

A partial 3-sheet plan set provided to Aspect by Parametrix (Sheets C60.01 through C60.03) shows approximately 850 lineal feet of frontage improvements along the south side of Dickey Drive NW, between Dickey Place NW on the east to Hoot Ridge Lane on the west. These improvements will include a shallow stormwater collection and conveyance pipeline with new curbs, gutters, and sidewalks, and a hot mix asphalt (HMA) overlay for the full eastbound lane width.

The partial plans we reviewed call for two retaining walls along the south edge of the new concrete sidewalk, one about 150 feet long along the western portion, and the other about 280 feet long along the eastern portion. Details depicting the wall heights were not provided. Aspect assumes that these fill walls will be relatively low (i.e., less than 4 feet high) and do not require structural engineering.

Aspect did not perform any pavement cores or do a formal pavement condition survey along this section. From visual observation, we consider the existing pavement to be in fair condition. We assume the existing asphalt thickness is at least 3 inches thick, meeting minimum Kitsap County (County) standards.

Frontage Improvements Conclusions and Recommendations

Assuming the travel lane can be raised by a couple inches in combination with the new curb, gutter, and sidewalk improvements, we recommend the overlay consist of a thin surface grind and a 2-inch HMA overlay. If the existing grade must be maintained, then we recommend a 2-inch grind and 2-inch overlay.

Excavation for the 12-inch-diameter storm sewer pipe will be relatively shallow and can be completed by backhoe. Subgrade along the trench bottom should be evaluated by the Owner's geotechnical inspector. Any remnant topsoil, tree roots or stumps, or other deleterious material along the trench bottom should be removed and replaced with suitable granular fill material. Till-fill derived from RAGF pond excavations will generally be suitable for re-use providing the work is completed in dry weather conditions.

Pipe bedding material should conform to pipe manufacturer's recommendations, and should be at least 6 inches thick below the pipe invert and at least 6 inches over the pipe crown. Subsequent backfill to bring the trench up to final subgrade should consist of imported gravel borrow compacted to at least 95 percent of the Modified Proctor maximum dry density per ASTM International (ASTM) D 1557.

Sidewalk and curb subgrade preparation should include removal of all loose, soft, and organic-rich material. The approved subgrade should then receive a layer of at least 4 inches of crushed surfacing base or top course (thicker where subexcavation and replacement was required), compacted to a at least 95 percent of the Modified Proctor maximum dry density. We recommend the cast-in-place concrete sidewalks be at least 4 inches thick to satisfy County standards.

The two presumed low fill walls could be cast-in-place concrete, or they could use pre-cast concrete modular blocks. If the walls are more than a few feet tall, then a handrail for fall protection will be required. If the walls are sufficiently low, the south edge of the cast-in-place concrete sidewalk

could simply be deepened to provide this function. The contract documents could require these walls to be contractor-designed, or they could be designed and specified by Parametrix. Aspect is available to provide more detailed wall-specific design and construction recommendations upon request.

Limitations

Work for this project was performed for Parametrix (Client), and this report was prepared consistent with recognized standards of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, expressed or implied, is made by Aspect Consulting (Aspect).

Recommendations presented herein are based on our interpretation of site conditions, geotechnical engineering calculations, and judgment in accordance with our mutually agreed-upon scope of work. Our recommendations are unique and specific to the project, site, and Client. Application of this report for any purpose other than the project should be done only after consultation with Aspect.

Variations may exist between the soil and groundwater conditions reported and those actually underlying the site. The nature and extent of such soil variations may change over time and may not be evident before construction begins. If any soil conditions are encountered at the site that are different from those described in this report, Aspect should be notified immediately to review the applicability of our recommendations.

It is the Client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, and agents, are made aware of this report in its entirety. If project developments result in changes from the information provided at the time of this addendum, Aspect should be contacted to determine if our recommendations contained in this report should be revised and/or expanded upon.

All reports prepared by Aspect for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect. Aspect’s original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

We appreciate the opportunity to perform these services. If you have any questions, please call Alison Dennison at 206-780-7717.

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