



The Riley Group Inc.

July 19, 2013

Mr. Craig Sears
Ogden Farms LLC
15 Lake Bellevue Drive, Suite 102
Bellevue, Washington 98005
Via email: craig@taylordev.com



**RE: Off-Site Impacts
Kirkmond Residential Development
10206 134th Avenue Northeast
Redmond, Washington
RGI Project No. 2012-470**

**References: Land Development Consultants, Inc. Kirkmond Plan Sheets 1 – 36 dated
May 29, 2013, Construction Plans revision dated June 25, 2013
Land Development Consultants, Inc. Preliminary Drainage Report for
Kirkmond Residential Plat dated May 28, 2013
The Riley Group, Inc. Geotechnical Engineering Report for Walling
Residential Plat dated October 26, 2012**

Dear Mr. Sears:

As requested, The Riley Group, Inc. (RGI) reviewed the referenced plans and geotechnical study for the project. The name of the plat was changed to Kirkmond after our report was issued.

We understand the neighbors to the south of the project have septic systems and are concerned about the functionality of their systems after the construction of the plat. The residential plat is proposed to route stormwater through roadside swales into a detention pond located on the southern portion of the property.

Existing Surface and Subsurface Conditions

The site slopes gently from the north to the south with an overall elevation difference of approximately 12 feet in the approximately 800-foot length of the site. On October 16, 2012, RGI observed the excavation of 15 test pits. The approximate exploration locations are shown on Figure 1.

The soils encountered during field exploration include 6 to 12 inches of topsoil underlain by silty sand with variable amounts of gravel. The soils were generally loose to medium dense near the surface and became dense to very dense at 2.5 to 4 feet below the surface. Fill soils extending up to 2 feet below grade were encountered in test pits TP-9, TP-14, and TP-15.

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Groundwater seepage was not encountered during our subsurface exploration, however, we expect groundwater will be perched over the top of dense to very dense glacial till layer in the winter and spring months. A cross-section through the southern portion of the property is attached as Figure 2 and the location of the section is shown on Figure 1.

The rainfall on the site is partially absorbed by the vegetation but the remaining either runs off as surface flow or infiltrates into the near surface soils and collects on the underlying very dense glacial till encountered at 3 to 4 feet below the ground surface. As shown on Figure 2 the surface of the very dense till routes the water that collects on the dense till layer to the south towards the residences that border the site.

Developed Conditions

Based on the referenced plans drainage report for the project, the developed site will consist of impervious surface and landscaped areas, and the undisturbed open space which will remain forested. Pollution Generating Impervious Surface (PGIS) will be collected in roadside swales which will act as bio-swales for water quality treatment. A separate underground system will convey roof, foundation and treated runoff to the pond for detention. Water will be detained on-site in a detention pond and then discharged into an underground conveyance system which will tie directly to the system within Northeast 100th Street Southeast.

The construction of the homes and other impervious surfaces will route water to the pond via the roadside swales and tight lines reducing the amount of water that collects on the impervious till surface that routes water to the residences offsite to the south. In addition, underground utilities are bedded in free draining materials that tend to collect water into the bedding around the pipes. Our experience with developments in similar soils indicates that the construction will reduce the amount of water that collects on the glacial till surface from rainfall events.

Detention Pond

The detention pond will be excavated into the native soils with the bottom of the pond at elevation 293.0. The native soils encountered in the southern side of the proposed pond consist of fill soils to 2 feet below grade on the southeast corner underlain by silty sand with gravel, the soils in the central portion consist of silty sand with gravel underlain by a two foot clayey silt layer and silty sand with gravel, and the southwestern corner is underlain by silty sand with gravel. The silty sand with gravel is generally very dense and cemented at four feet below the existing grade.

The topsoil, fill and loose soils will be removed from the area of the pond berm, the exposed surface compacted to a firm and unyielding condition and additional fill soils placed to create the pond berm. The native soils will be used for the pond berm and have approximately 25 percent fines based on laboratory testing completed on the soils in the area of the pond. The construction of the pond berm will reduce the permeability of the native soils and effectively provide a more than six foot glacial till liner for the pond.

Based on the design of the pond, a 10 year storm (10 yr storm is better defined as a storm with a 10 percent chance of occurring in a year). will raise the water level in the pond to elevation 298.3

feet. The 10 year volume will completely drain from the pond in about 3-days through the designed storm outfall. The pond overflow is controlled by a 48 inch diameter manhole at elevation 299 feet. The top of the six foot wide pond berm is at elevation 300 feet. The existing ground surface between the pond berm and the south property line is at elevation 298 feet and will not be modified. The top of the two foot high pond berm is 10 to 20 feet away from the south property line and several trees will be saved along the south property line.

Septic System Functionality

According to the United States Department of Agriculture (USDA) Soil Conservation Services (SCS) for King County and our explorations on site, the site soils consist of Alderwood Gravelly Sandy Loam. The typical profile contained in the USDA SCS consists of 0 to 27 inches of gravelly sandy loam underlain by weakly to strongly consolidated till. This description is consistent with the subsurface conditions except the interface with the consolidated till was typically 3 to 4 feet below grade. According to the SCS, the permeability of the lower consolidated till layer is less than 0.06 inches per hour. In addition the degree of limitation for septic tank filter areas in the soils is considered severe because of the depth to the consolidated layer and the conductivity of the soils.

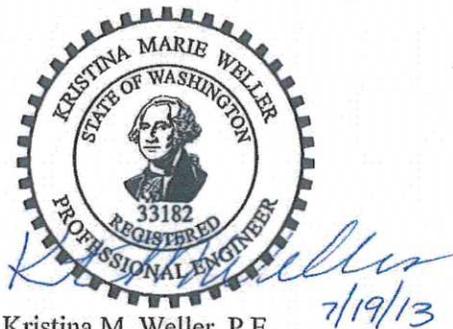
Closure

Based on the existing and proposed surface and subsurface conditions and the construction recommendations provided in our referenced geotechnical report for site preparation and structural fill for the site, the development will not increase the amount of subsurface water that flows towards the properties located south of the site.

We trust this information meets your current needs. Please call us if you have any questions or need additional information at (425) 415-0551.

Sincerely,

THE RILEY GROUP, INC.



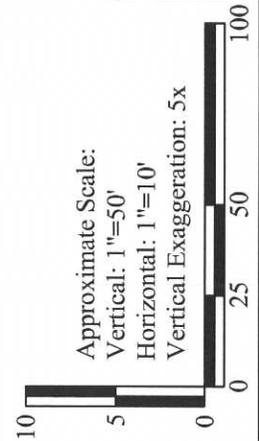
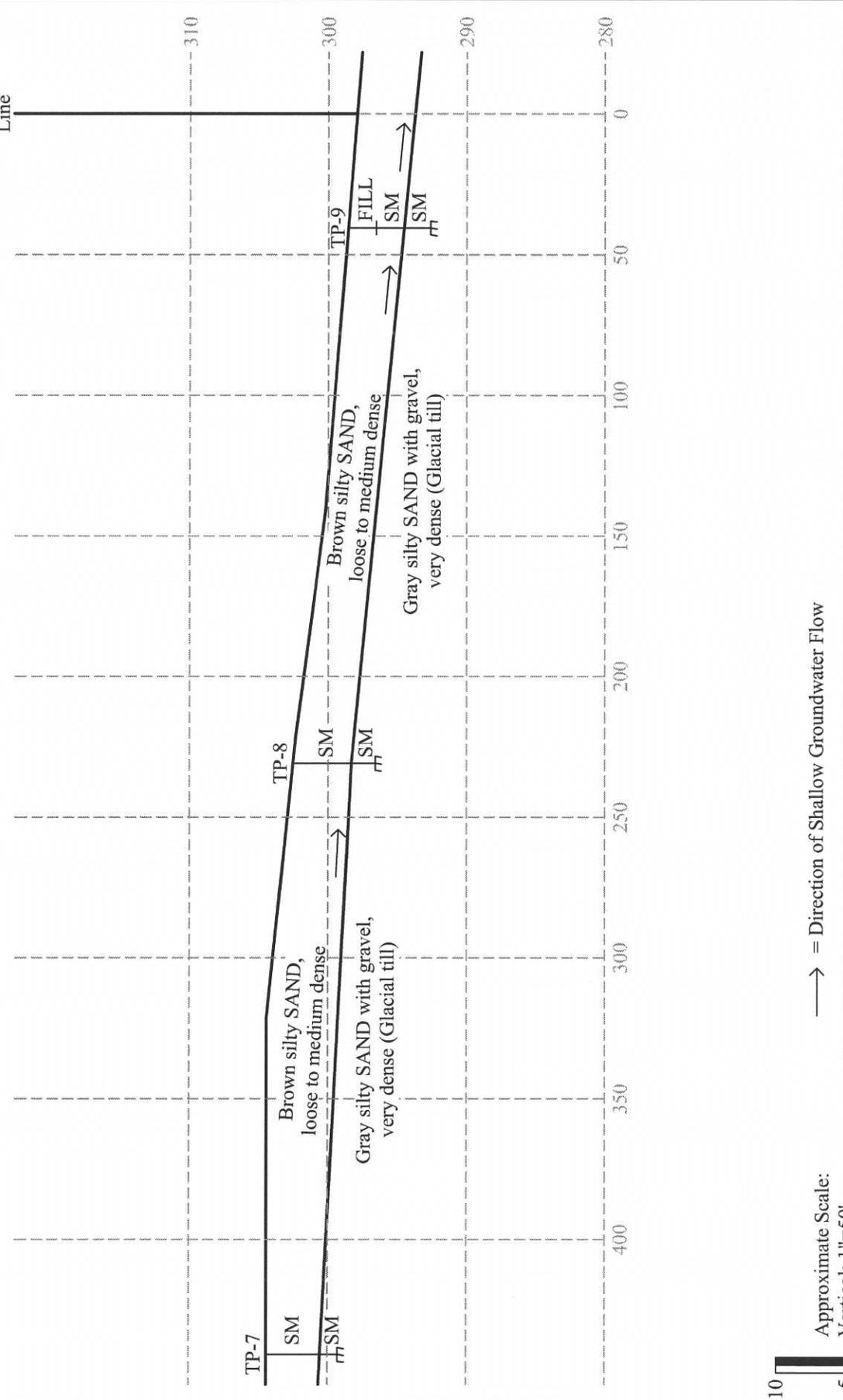
Kristina M. Weller, P.E.
Senior Project Engineer

Attachments: Figure 1 Geotechnical Exploration Plan
Figure 2 Cross-Section

THE RILEY GROUP, INC.

Existing Surface and Subsurface Conditions

South Property Line

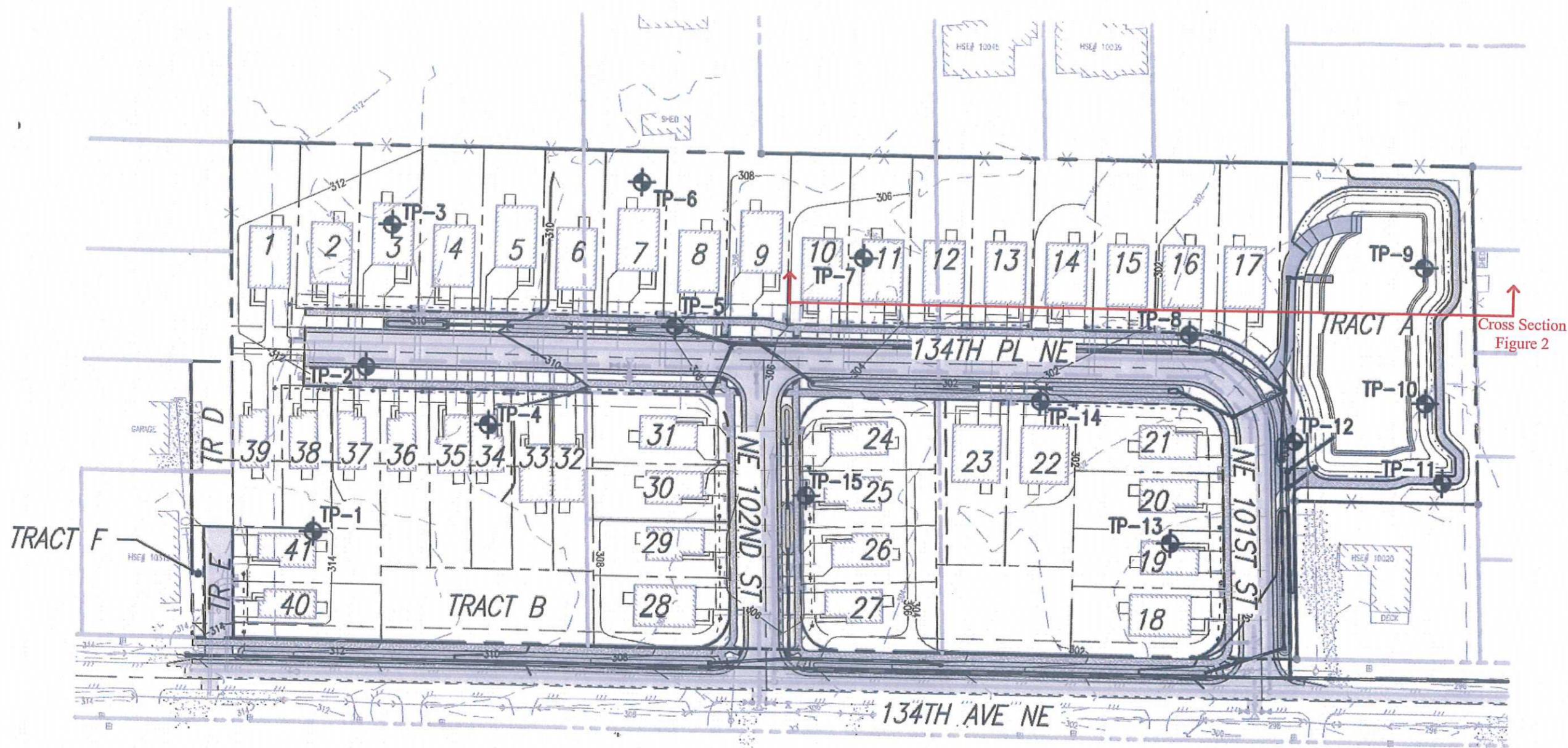


→ = Direction of Shallow Groundwater Flow

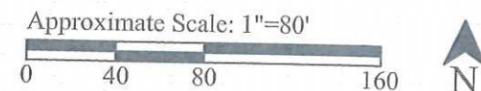
RGI Project Number 2012-470	Kirkmond Plat Cross Section	Figure 2
Address: 10032 to 10206 134th Avenue Northeast, Redmond, Washington 98033		Date Drawn: 07/2013



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Cross Section
Figure 2



⊕ = Test Pit Location by RGI on 10/16/12
 Drawn from LDC, Geotechnical Exploration Plan, 07/02/13.

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Kirkmond Plat		Figure 1
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