GEODESIGN INC

# Addendum Transmittal



| | | | |
|---|---|---|---|
| To: | Justine Hill | From: | Shawn Dimke |
| Company: | Seaside School District,<br>Business Office | Date: | June 12, 2018 |
| Address: | 1801 S Franklin Street<br>Seaside, OR 97138 | | |

| | |
|---|---|
| cc: | Jim Henry, Day CPM Services (via email only)<br>Dan Hess, Bric Architecture (via email only)<br>Mark Wharry, KPFF Consulting Engineers (via email only)<br>Jonathan Estabrook, KPFF Consulting Engineers (via email only) |

| | |
|---|---|
| GDI Project: | SeasideSD-1-03-01 |
| RE: | Seaside New Middle School/High School |

| Original File Name | Date | Document Title |
|---|---|---|
| SeasideSD-1-03-01-112017-geor | 11/20/2017 | Report of Geotechnical Engineering Services; Seaside School District Campus; Seaside, Oregon |

| Addendum Number | Date | Description |
|---|---|---|
| 1 | 6/12/2018 | Additional Recommendations for Foundations, Topsoil Placement, and Walls (attached) |

sn

Attachment

One copy submitted (via email only)

Document ID: SeasideSD-1-03-01-061218-geoat-1.docx

GEODESIGN INC

# Memorandum



| | | | |
|---|---|---|---|
| To: | Justine Hill | From: | Shawn M. Dimke, P.E., G.E. |
| Company: | Seaside School District,<br>Business Office | Date: | June 12, 2018 |
| Address: | 1801 S Franklin Street<br>Seaside, OR 97138 | | |

| | |
|---|---|
| cc: | Jim Henry, Day CPM Services (via email only)<br>Dan Hess, Bric Architecture (via email only)<br>Mark Wharry, KPFF Consulting Engineers (via email only)<br>Jonathan Estabrook, KPFF Consulting Engineers (via email only) |

| | |
|---|---|
| GDI Project: | SeasideSD-1-03-01 |
| RE: | Addendum 1<br>Additional Recommendations for Foundations, Topsoil Placement, and Walls<br>Seaside New Middle School/High School<br>Seaside, Oregon |

## INTRODUCTION

This addendum provides additional recommendations to our November 20, 2017 geotechnical report[1] related to foundations, topsoil placement, and walls for the planned new middle school/high school located in Seaside, Oregon.

## FOUNDATION RECOMMENDATIONS

Gym areas can be supported on continuous footings tied together with a continuously reinforced slab rather than a mat foundation as recommend for the school building in our geotechnical report. Continuous footings for gym areas should be designed in accordance with the spread footings recommendations provided in our report.

The modulus of subgrade reaction for analysis of the mat foundation can be doubled for the analyses of dynamic loads. We understand bearing pressures for the mat foundation will be less than 4,500 pounds per square foot for dynamic loading, which is acceptable.

## TOPSOIL PLACEMENT OVER CEMENT- AND/OR LIME-TREATED SOILS

We recommend placing Fortrac 3D-30 geogrid (or an engineer approved equivalent three-dimensional geogrid) underlain by intermittent strip drains for anti-slip reinforcement and

[1] GeoDesign, Inc., 2017. *Report of Geotechnical Engineering Services; Seaside School District Campus; Seaside, Oregon,* dated November 20, 2017. GeoDesign Project: SeasideSD-1-03-01

drainage over slopes constructed using cement- and/or lime-treated soils prior to placement of the overlying topsoil. The geogrid should be pinned and anchored to the slope as recommended by the manufacturer. Geocomposite strip drains should be placed below the geogrid on maximum spacings of 30 feet to collect and route water to a suitable discharge. The geocomposite strip drains should have a non-woven geotextile exterior meeting the drainage geotextile recommendations in our geotechnical report.

**SOLDIER PILE RETAINING WALL** AKA WALL D

***DESIGN PARAMETERS***

We understand a cut retaining wall ranging in height up to approximately 17 feet with 3H:1V slopes above and below is planned east of the track and athletic field. We recommend a soldier pile and prestressed tieback retaining wall to limit the potential for relaxation and creep movement of the combined cut wall and slopes. All the recommended earth pressures provided below are based on equivalent fluid pressures. The prestressed tieback wall can be designed using an earth pressure of 45 pounds per cubic foot (pcf) for the retained soil to account for the 3H:1V backslope. Our prestressed tieback wall recommendations assume one row of tiebacks; if multiple rows of tiebacks are required, we should be contacted to revise our earth pressure recommendations. End sections of the soldier pile wall that are less than approximately 6 feet high can be designed as a cantilever system provided they are designed for an "at-rest" earth pressure of 71 pcf, which accounts for the slope of up to 3H:1V above the wall. Pressure on the retained side of the wall should be considered to act on 1 times the pile width below the excavated finish grade. Passive resistance on the embedded portion of the piles should be reduced to 200 pcf to account for the 3H:1V slope below. The passive resistance can be calculated to act over 2.5 times the pile widths, including the grouted diameter of the piles. The passive resistance for the upper 2.0 feet of soil below the excavated finish grade should be neglected. We recommend a minimum soldier pile embedment of 10 feet.

***TIEBACKS***

The bonded zone for the tieback anchors should be maintained outside of a 60-degree angle of inclination with a 5-foot horizontal offset from the base of the wall face. We anticipate that the tieback anchors will be capable of achieving an ultimate bond strength of between 1 to 4 kips per square foot in the predominantly stiff to very stiff clay, depending on the method of construction. A variety of methods are available for construction of tieback anchors; therefore, we recommend that the contractor be responsible for selecting the appropriate bonded length and installation methods to achieve the required anchor capacity. Tieback anchors should be locked off at 100 percent of the design load.

Prior to installing production anchors, we recommend that performance testing be conducted on a minimum of one anchor. The purpose of this testing is to verify the installation procedure selected by the contractor before a large number of anchors is installed. Performance testing should be performed to 200 percent of the design load and in accordance with the guidelines presented in *Recommendations for Prestressed Rock and Soil Anchors*[2].

[2] Post Tensioning Institute, 2014. *Recommendations for Prestressed Rock and Soil Anchors.*

We recommend that proof testing be conducted on all production anchors in accordance with the guidelines presented in *Recommendations for Prestressed Rock and Soil Anchors*. The anchors should be proof tested to at least 133 percent of the design load.

***DRAINAGE***

We recommend constructing the soldier pile wall with sheet drains covering 100 percent of the lagging. The drainage pipe at the base of the sheet drains should be sloped and routed to drain into the stormwater system.

**GLOBAL STABILITY WALL EVALUATIONS**

The retaining walls necessary for site grading have not yet been designed. We understand LOCK+LOAD grid reinforced retaining walls are planned for the site grading in addition to the soldier pile and tieback wall for the cut area east of the track and field, for which recommendations are provided above. All walls will need to be designed with proper embedment and reinforcement to satisfy global stability requirements, which may require deeper embedment and/or greater reinforcement. We recommend that GeoDesign evaluate the global stability or review global stability evaluations conducted for the retaining walls needed for grading of the site.

♦ ♦ ♦

We appreciate the opportunity to be of continued service to you. Please call if you have questions regarding this addendum.

SMD:sn
One copy submitted (via email only)
Document ID: SeasideSD-1-03-01-061218-geoa-1.docx