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PAVEMENT DESIGN REPORT
RETREAT AT TIMBERRIDGE Filing No. 3
EL PASO COUNTY, COLORADO

PCD File No. SF2241

Prepared for:
TimberRidge Development
2138 Flying Horse Club Drive
Colorado Springs, CO 80921

Attn: Austin Lenz

August 16, 2024

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Lucas Morrison
Staff Engineer

Reviewed by:

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Digitally signed by Joseph C Goode III
Date: 08/16/24

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SW:JCG/ed
Entech Job No. 221106

Exhibit 3: Recommended Pavement Sections

Pavement Area	Design ESAL	Alternative [1]
Antelope Ravine Drive, Hawks Hill Court, Aspen Valley Road	292,000	1. 3.0 inches HMA over 8.0 inches ABC
		2. 3.0 inches HMA over 8.0 inches CTS

ABC = Aggregate Base Course; ESAL = equivalent single axle loads; HMA = Hot Mix Asphalt; CTS = Cement Treated Soil

Notes:

1. All pavement alternatives meet the minimum sections required per the *El Paso County Engineering Criteria Manual.*

6 Construction Recommendations

Pavement design recommendations provided herein are contingent on good construction practices, and poor construction techniques may result in poor performance. Our analyses assumed that this project will be constructed according to the *El Paso County Engineering Criteria Manual* and the *Pikes Peak Region Asphalt Paving Specifications*.

6.1 Earthwork Recommendations for Pavement Subgrade

Proper subgrade preparation is required for adequate pavement performance. Paving areas should be cleared of all deleterious materials including but not limited to: existing pavements, utility poles, and fence poles. Surface vegetation, if any, should be removed by stripping, with the depth to be field determined.

6.1.1 Subgrade Preparation – Aggregate Base Course

If pavement section alternatives are selected utilizing aggregate base course (ABC), the final subgrade surface should be scarified to a depth of 8 inches, moisture conditioned within +/-2% of the optimum water content, and recompacted to 95% of the Modified Proctor (ASTM D1557) maximum dry density.

The compacted surface below pavements should be proof-rolled with a fully loaded, tandem-axle, 10-yard dump truck or equivalent. Any areas that are delineated to be soft, loose, or yielding during proof-rolling should be removed and reconditioned or replaced.

6.1.2 Subgrade Preparation – Cement Treated Base

For pavement section alternatives utilizing cement treated subgrade, the subgrade shall be stabilized prior to placement of the asphalt by the addition of cement to a depth of 8 inches. The

amount of cement applied shall be a minimum of 2% (by weight) of the subgrade's maximum dry density as determined by the Modified Proctor (ASTM D1557) for granular soils or by the Standard Proctor (ASTM D698) for cohesive soils. The cement should be spread evenly on the subgrade surface and be thoroughly mixed into the subgrade such that a uniform blend of soil and cement is achieved to the CTS design depth. Prior to application or mixing of the cement, the upper 10 inches of subgrade should be thoroughly moisture conditioned to the soil's optimum water content or as much as 2% more than the optimum water content as necessary to provide a compactable soil condition. Densification of the cement-stabilized subgrade should be completed to obtain a compaction of at least 95% of the subgrade maximum dry density as determined by the Modified Proctor (ASTM D1557) or by the Standard Proctor (ASTM D698). Satisfactory compaction of the subgrade shall occur within 90 minutes from the time of mixing the cement into the subgrade.

The following conditions shall be observed as part of the subgrade stabilization:

- Type I/II or Type 1L cement as supplied; a local supplier shall be used. All cement used for stabilization should come from the same source. If cement sources are changed, a new laboratory mix design should be completed.

- Moisture conditioning of the subgrade and/or mixing of the cement into the subgrade shall not occur when soil temperatures are below 40 degrees F. Cement treated subgrades should be maintained at a temperature of 40 degrees F or greater until the subgrade has been compacted as required.

- Cement placement, cement mixing, and compaction of the cement treated subgrade should be observed by a qualified geotechnical engineer. The geotechnical engineer should complete in-situ compaction tests and construct representative compacted specimens of the treated subgrade material for subsequent laboratory quality assurance testing.

Pending the results of the field density testing, microfracturing of the stabilized subgrade may be required. Soil strengths in excess of 200 psi may require microfracturing.

6.1.3 Fill Placement and Compaction

Granular fill placed as part of the pavement subgrade shall consist of non-expansive, granular soil, free of organic matter, unsuitable materials, debris, and cobbles greater than 3 inches in diameter. Additionally, any granular fill placed as part of the roadway subgrade should have a minimum CBR of 5. All granular fill placed within the pavement subgrade should be compacted