Job No. 171800

August 31, 2020

Grace Covington
Covington Properties, LLC
13725 Struthers Road, Suite 201
Colorado Springs, CO 80921

Re: Addendum to Pavement Design Report – SF- 195
The Gardens at North Carefree
El Paso County, Colorado

Dear Ms, Covington,

As requested, RMG – Rocky Mountain Group completed a Pavement Design Report for the referenced project entitled

Pavement Design Report
The Gardens at North Carefree SF-195
RMG Job No. 171800
Dated May 12, 2020

This report was approved by El Paso County on May 19, 2020. The approved pavement section is as follows:

Streets	HMA (in)	CTS (in)
Vineyard Circle, Fallow Lane, Running Deer Way	3.75	9.0

We understand the entirety of Vineyard Circle was developed with the approved pavement section. The purpose of this addendum to the Approved Report is to allow for an alternate pavement section for Fallow Lane and Running Deer Way. In lieu of installing the approved HMA/CTS section, the following HMA/ABC pavement section is proposed:

Streets	HMA (in)	ABC (in)	Prepared Subgrade (in)
Fallow Lane, Running Deer Way	3.75	9.0	12.0

Pavement Design

The following pavement design performed in accordance with El Paso County Engineer Criteria supports the proposed pavement section. Soil parameters from the referenced Pavement Report are utilized.

Street Classification – Urban Local Residential

1) Fallow Lane, Running Deer Way
   ESAL = 292,000 (Table D-2)
   Serviceability Index = 2.0 (Table D-1)
   Reliability = 80% (Table D-1)

2) Strength coefficients (Table D-3)
   Asphalt (HMA): $a_1 = 0.44$
   Aggregate Base Course (ABC): $a_2 = 0.11$

3) Subgrade
   M_r = CBR x 1500 = 5.1 x 1500 = 7,650 psi

4) Structural number (SN) = 2.60 (1993 AASHTO Empirical Equation, Appendix A)

5) Composite asphalt/cement treated subgrade section
   Minimum HMA thickness = D_1 = 3 inches (Table D-2)
   ABC thickness = $D_2 = \{SN – (D_1 \times a_1)\} / a_2 = \{2.60 – (3 \times 0.44)\} / 0.11 = 11.6$ inches

6) In accordance with El Paso County ECM, Section D.4, Paragraph F, *The base course thickness selected cannot exceed 2.5 times the HMA thickness selected.*
   Therefore, try Asphalt thickness = 3.75 inches
   ABC thickness = $D_2 = \{SN – (D_1 \times a_1)\} / a_2 = \{2.60 – (3.75 \times 0.44)\} / 0.11 = 8.6$ inches
   Use HMA = 3.75 inches and ABC = 9 inches

   Check SN = (3.75 x 0.44) + (9 x 0.11) = 2.64 > 2.60 (Min. SN required) => OK

Subgrade Preparation

A composite section of HMA over ABC may be placed atop a 12-inch layer of prepared subgrade. Pavement areas should have topsoil, organic material, and debris removed to bottom of subgrade elevation. The upper 6 inches of exposed soil should be scarified and moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to firm and unyielding condition. Subgrade should then be brought to grade by installing clean soil in 8-inch loose lifts and compacted to 95 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557). The subgrade should then be proof-rolled with a heavy, pneumatic tired vehicle, and any areas that deform under wheel loads should be removed and replaced with clean material and recompacted. Subgrade construction should continue until 12-inches of prepared subgrade has been placed.

Aggregate Base Course

Aggregate base course material shall meet the criteria of the El Paso County Engineering Criteria Manual, Appendix D, Section D.5, Paragraph I. Aggregate Base Course gradation shall meet the criteria for CDOT base course, Class 5 or Class 6. Aggregate base course shall be supplied from an approved source.

All findings, conclusions and recommendations presented in the report referenced above and not specifically addressed in this letter remain valid for the currently proposed project.

Should you have questions, please do not hesitate to call.

Cordially,

RMG – Rocky Mountain Group

Geoff Webster, P.E.
Sr. Geotechnical Project Engineer