



Planning and Community  
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## DEVIATION REQUEST AND DECISION FORM

Updated: 6/26/2019

### PROJECT INFORMATION

Project Name : Trails at Aspen Ridge Filing No. 3 Phase 2

Schedule No.(s) :

Legal Description :

### APPLICANT INFORMATION

Company : COLA, LLC

Name : Richard A. Van Seenus

Owner  Consultant  Contractor

Mailing Address : 555 Middle Creek Parkway, Suite 500  
Colorado Springs, CO 80920

Phone Number : 719-747-2556

FAX Number :

Email Address : rvanseenus@viewhomesinc.com

### ENGINEER INFORMATION

Company : Entech Engineering Inc.

Name : Joseph C Goode III

Colorado P.E. Number : 52381

Mailing Address : 505 Elkton Dr  
Colorado Springs, CO 80907

Phone Number : 719-531-5599

FAX Number :

Email Address : jcg@entechengineers.com

**OWNER, APPLICANT, AND ENGINEER DECLARATION**

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

[Signature]  
Signature of owner (or authorized representative)

12/6/24  
Date

Engineer's Seal, Signature  
And Date of Signature



Digitally signed by Joseph C Goode III  
Date: 12/06/24

**DEVIATION REQUEST** (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section **D.3.3-D.4.1F** of the Engineering Criteria Manual (ECM) is requested.

Identify the specific ECM standard which a deviation is requested:

A deviation in ECM D.3.3 and D.4.1.F is requested to use a composite section of asphalt and mechanically stabilized base (MSB) as opposed to a composite section of asphalt over aggregate base course. MSB will consist of recycled concrete base (RCB) and Tensar Nx750 composite polymer geogrid.

The development filing is Trails at Aspen Ridge Filing No. 3 Phase 2. The roadways included are Rainy Creek Trail, Triple Tree Street, and Turkey Flat Lane.

State the reason for the requested deviation:

A 5.0 inches HMA over 6.0 inches of MSB is proposed to provide a composite section with a higher structural number than the minimum section required and more constructable HMA section due to the site subgrade materials and shallow depths to utility infrastructure. In addition, the 5.0 inches HMA over 6.0 inches MSB will be placed on an additional 6 inches of RCB and Nx750 geogrid to stabilize the subgrade. Site utilities including gas utility and water lines are located within 12 inches of the top of pavement subgrade which restricts the ability to rework site native subgrade.

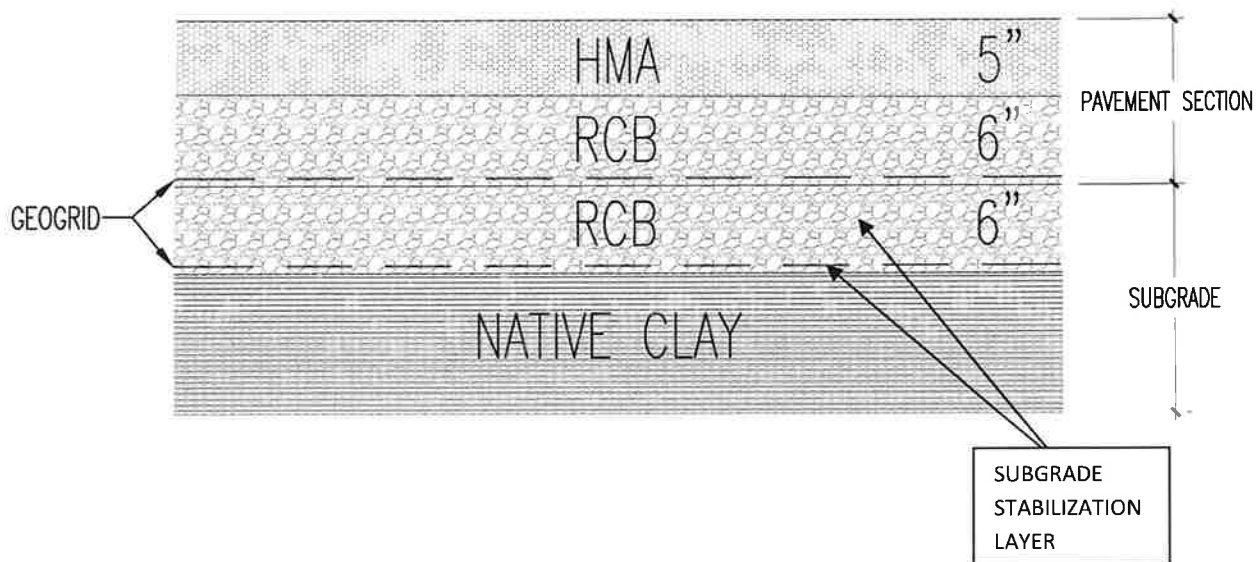
A MSB layer consisting of recycled concrete base (RCB) and Tensar Nx750 composite polymer geogrid is recommended.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

The ECM minimum pavement section of 3.0 inches HMA over 8.0 inches ABC provides a structural number of 2.20 ( $3.0 \times 0.44 + 8 \times 0.11$ ). The required structural number for the project site is 3.47 based on the site subgrade soils.

The proposed alternative pavement section of 5.0 inches HMA over 6.0 inches MSB (recycled concrete base with Tensar NX750) provides a structural number of 3.616 ( $5.0 \times 0.44 + 6 \times 0.236$ ) which exceeds the required structural number of 3.47. In addition, the 5.0 inches HMA over 6.0 inches MSB will be placed on an additional 6 inches of RCB and Nx750 geogrid to stabilize the subgrade. Refer to the exhibit below for a schematic. The final roadway profile will consist of 5 inches of HMA over 12 inches of MSB (6 inches of MSB are included in the pavement section and 6 inches are included as subgrade stabilization).

Based on guidance from Tensar+ software, a structural layer coefficient of 0.236 was used for the MSB. The structural layer coefficient for the MSB is based on guidance and research provided by Tensar and the Tensar+ design software. Empirical analysis and full-scale pavement tests with traffic have been carried out as part of the basis for design guidance. The current approved pavement section includes 5 inches of HMA over 12.5 inches of RCB. The difference in RCB thickness is accounted for in the mechanical stabilization of the RCB.



**LIMITS OF CONSIDERATION**

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- The ECM standard is inapplicable to the particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

As described above, the required Structural Number of 3.47 is exceeded with a composite section of 5.0 inches HMA over 6.0 inches MSB with no compromise to public safety or accessibility. ECM layer coefficients presented in Table D-3 do not include mechanically stabilized base, therefore 0.236 was used for design of the pavement section based on guidance from Tensar. The design structural number of 3.616 exceeds the required structural number of 3.47.

**CRITERIA FOR APPROVAL**

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

As described above the structural number for the proposed section will be higher than the ECM minimum.

The deviation will not adversely affect safety or operations.

The proposed change will not affect or change safety or operations as the asphalt roadway will meet the criteria for public roadways.

The deviation will not adversely affect maintenance and its associated cost.

Once the roadway is a part of the county maintenance program there will be no additional maintenance and maintenance costs as the mechanically stabilized base will provide superior long-term support of the roadway.

The deviation will not adversely affect aesthetic appearance.

The proposed change is underlying the asphalt layer so will have no visible aesthetic affect. The roadway will look the same as any new asphalt roadway in El Paso County.

The deviation meets the design intent and purpose of the ECM standards.

The structural number of the asphalt and MSB section exceeds the structural number required for the site conditions.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

Because the deviation request includes adding mechanical stabilization to the base course which is in the roadway subgrade, it will have no affect on the MS4 permit already in place for the project. The Part I.E.3 and Part I.E.4 of the MS4 permit are being met for the overall subdivision development.

**REVIEW AND RECOMMENDATION:**

**Approved by the ECM Administrator**

This request has been determined to have met the criteria for approval. A deviation from Section D.3.3, D.4.1.F of the ECM is hereby granted based on the justification provided.

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**Denied by the ECM Administrator**

This request has been determined not to have met criteria for approval. A deviation from Section \_\_\_\_\_ of the ECM is hereby denied.

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**ECM ADMINISTRATOR COMMENTS/CONDITIONS:**

## **1.1. PURPOSE**

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

## **1.2. BACKGROUND**

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

## **1.3. APPLICABLE STATUTES AND REGULATIONS**

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

## **1.4. APPLICABILITY**

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

## **1.5. TECHNICAL GUIDANCE**

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

## **1.6. LIMITS OF APPROVAL**

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

## **1.7. REVIEW FEES**

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.

## FLEXIBLE PAVEMENT DESIGN

### PROJECT DATA

Project Location Trails at Aspen Ridge, Filing No. 3, Soil Type 1  
 Job Number: 240367

### DESIGN DATA

Equivalent (18-kip) Single Axle Load Applications (ESAL):  
 Design CBR  
 Standard Deviation  
 Loss in Serviceability  
 Reliability  
 Reliability (z-statistic)  
 Soil Resilient Modulus

ESAL ( $W_{18}$ ) =	292,000
CBR =	2
$S_o$ =	0.45
$\Delta\psi$ =	2.5
Reliability =	80
$Z_R$ =	-0.84
$M_R$ =	3,000 psi

Required Structural Number (SN):



SN = 3.47

### DESIGN EQUATIONS

#### Resilient Modulus

If using CBR:

$$M_R = (\text{CBR}) \times 1,500$$

If using R-Value:

$$M_R = 10^{[(S_1 + 18.72) / 6.24]} \text{ where: } S_1 = [(R\text{-value} - 5) / 11.29] + 3$$

#### Required Structural Number

$$\log_{10} W_{18} = Z_R \cdot S_o + 9.36 \cdot \log_{10} (SN+1) - 0.20 + \frac{\log_{10} \left[ \frac{\Delta \text{PSI}}{4.2 - 1.5} \right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 \cdot \log_{10} M_R - 8.07$$

#### Pavement Section Thickness

$$SN^* = C_1 D_1 + C_2 D_2$$

where:

$C_1$  = Strength Coefficient - HMA

$C_2$  = Strength Coefficient - MSB

$D_1$  = Depth of HMA (inches)

$D_2$  = Depth of MSB (inches)

### RECOMMENED THICKNESSES

Layer	Material	Coefficient	Thickness ( $D^*_i$ )	$SN^*_i$	SN
1	HMA	$C_1 = 0.44$	5.0 inches	2.200	-
2	MSB	$C_2 = 0.236$	6.0 inches	1.416	
				<b><math>SN^* = 3.616</math></b>	<b>3.47</b>

Pavement SN > Required SN, Design is Acceptable

FIG. 1



# Asphalt Pavement Design Analysis

<b>Design</b>	<b>Reference</b>
<b>Project</b>	<b>Location</b>
<b>Customer</b>	<b>Designer</b> Joey Goode
<b>Company</b> Entech Engineering	<b>Date</b> November 22, 2024

## Method of analysis

The calculation method used to create this Tensor software output is the design method for flexible pavements given in the AASHTO Guide for Design of Pavement Structures 1993. The enhancement of performance due to the inclusion of Tensor geogrids in the stabilised layer is derived empirically from full scale pavement tests and trafficking trials carried out by independent authorities.

## Results



	Thickness	Coeff.	SN
HMA layer 1	5 in	0.440	2.200
Aggregate base (NX750)	6 in	0.236	1.416
<b>Structural number (SN)</b>			<b>3.616</b>

	Thickness	Coeff.	SN
HMA layer 1	4 in	0.400	1.600
Aggregate base	10 in	0.140	1.400
<b>Structural number (SN)</b>			<b>3.000</b>

## Parameters

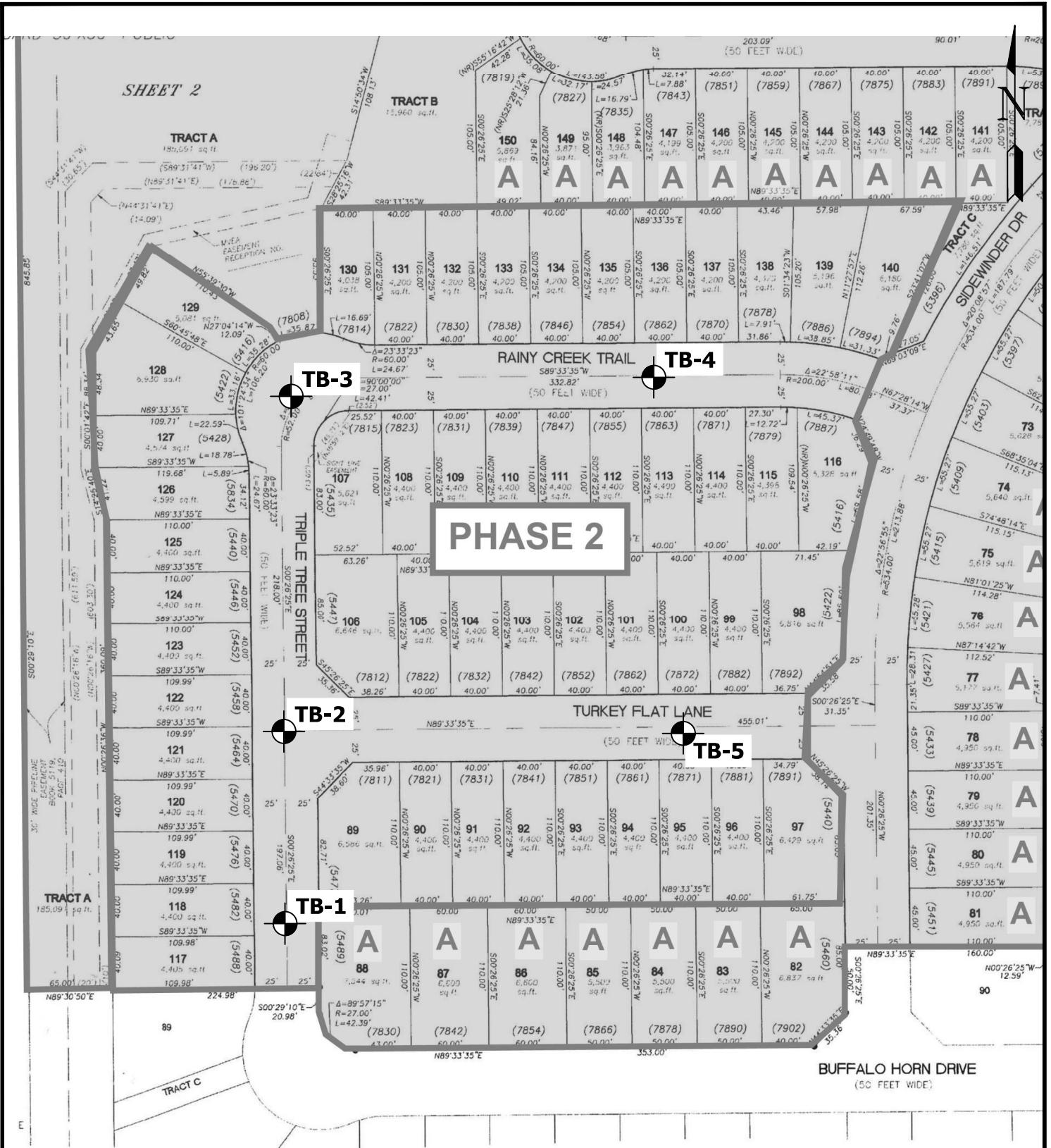
### Project Information

Target ESALs	Subgrade resilient modulus	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
292,000	3,000 psi	80%	0.45	4.5	2

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FIG. 2



 **TB- APPROXIMATE TEST BORING LOCATION AND NUMBER**



**SITE AND EXPLORATION MAP**  
 TRAILS @ ASPEN RIDGE F3  
 COLA

JOB NO.  
 240367

**FIG. 2**