



Cook, Flatt & Strobel Engineers
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Kansas City, Kansas 66103
913.627.9040

March 17, 2025

David N. Olson
Oldham Investors, LLC
P.O. Box 24302
Overland Park, KS 66283

Re: Oldham Village Pavement Design
SW Jefferson Street and Oldham Parkway
Lee's Summit, Missouri
CFS Geotechnical Report # 24-5632

Mr. Olson,

Cook, Flatt & Strobel (CFS) Engineers, P.A. has been asked to re-evaluate the pavement section previously provided for the referenced project. CFS understands that the truck amounts have been adjusted to provide a more conservative number for pavement design. CFS understands that Kimley-Horn, who provided the traffic study, has approved these numbers and considers them to be conservative. The equivalent single axle load (ESAL) calculation sheet with associated total is attached to this letter. The required ESAL's for the 35 year design life of the pavement are 8.149 million. The following pavement section exceeds this requirement.

Material	Lee's Summit Pavement (in)
KCMMB A1 Surface	2.0
KCMMB A2 Surface	4.0
KCMMB A3 Base	4.0
MODOT Type 5 or Type 1	7.0
Geogrid	Yes
Sub-Grade Material	Compacted Soil
Structural Number	5.532
ESAL's (millions)	8.162

Tensar Plus flexible pavement design program was used to develop the pavement section. A CBR value of 3.0 was utilized for the pavement sub-grade. A 95% Reliability and 2.5 Terminal Serviceability were utilized per the city of Lee's Summit requirements.

CFS utilized structural coefficients for the asphalt KCMMB A1, A2 and A3 of 0.44, 0.42 and 0.40, respectively. We feel that these coefficients are typical for the type of asphalt used, and considering the KCMMB higher quality binder material, that these numbers are applicable.



Please contact CFS with further questions. 913-627-4090

Respectfully,
Cook, Flatt & Strobel Engineers, P.A.

A handwritten signature in blue ink, appearing to read "Adam M. McEachron", is written over the printed name and partially over the professional seal.

Adam M. McEachron, P.E.
Senior Geotechnical Engineer



Attachments: Pavement Program Results
Pavement ESAL Calculation Sheet

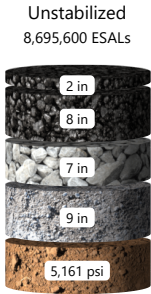
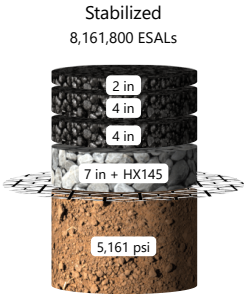
Asphalt Pavement
Design Analysis

Design		Reference	
Project		Location	
Customer		Designer	Adam McEachron
Company	CFS Engineers	Date	March 13, 2025

Method of analysis

The calculation method used to create this Tensar 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 Tensar 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	2 in	0.440	0.880
HMA layer 2	4 in	0.420	1.680
HMA layer 3	4 in	0.400	1.600
Aggregate base (HX145)	7 in	0.196	1.372
Structural number (SN)			5.532

	Thickness	Coeff.	SN
HMA layer 1	2 in	0.440	0.880
HMA layer 2	8 in	0.350	2.800
Aggregate base	7 in	0.130	0.910
Chemically-treated subbase	9 in	0.110	0.990
Structural number (SN)			5.580

Parameters

Project Information					
Target ESALs	Subgrade resilient modulus	Reliability	Standard deviation	Serviceability	
				Initial	Terminal
100,000	5,161 psi	90%	0.49	4.2	2.5

This report was prepared using Tensar+ (2.18.3)
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Limitations of this Report
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DCM Typical ESAL Calcs-Industrial (1) AC ESALs-2% 5-axle

Annual Traffic Growth = 2.0%

Percent of Truck Traffic = 2.0%

Truck Factor Method = AAHSTO D Tables

Analysis Period = 35 Years

p_t = 2.5

Assume SN = 5.5

Vehicle Types	Traffic	Factors	(C)	Factor	ESAL	Lane Factor	Pavement
Passenger Cars	14,400	49.99	262,771,092	0.0002	52,554		
Buses (school)	300	49.99	5,474,398	0.37	2,025,527		
	14,700						
Other 2-axle/4-tire Trucks	500	49.99	9,123,996	0.012	109,488		
2-axle/6-tire trucks	300	49.99	5,474,398	0.37	2,025,527		
3 or More Axle Trucks	50	49.99	912,400	1.279	1,166,959		
All Single Unit Trucks	850						
3 axle Tractor-trailers	300	49.99	5,474,398	1.071	5,863,080		
4 axle Tractor-trailers	150	49.99	2,737,199	1.847	5,055,606		
5 axle Tractor-trailers	0	49.99	0	2.369	0		
6+ axle Tractor-trailers				1.525			
All Tractor-trailers	450						
5 axle double trailers				0			
6+ axle double trailers				0			
All Double trailer combos	0						
3 axle truck-trailers							
4 axle truck-trailers							
5+ axle truck-trailers							
All truck-trailer combos	0						
All vehicles	16,000				16,298,742	0.5	8,149,371