



Lithified Technologies

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 Santa Fe, New Mexico 87506
 (505) 982-7444

VALUE DESIGN FOR ROADS USING LITHIFIED TECHNOLOGIES LithTec4Roads™

In order to determine suggested road base thickness, LithTec™ dosage, and surface course thickness, the first step is to analyze the soil under the current road to be replaced or upgraded to ascertain the Atterberg limits, soil gradation, sieve analysis, AASHTO classification, Proctor and subgrade modulus. These results will help confirm that the existing road base and asphalt/chip seal surface can be recycled in place and LithTec™ can be added without any new flex base or other import materials. The next step is to complete an AASHTO Equivalent Single Axle Load (ESAL) Client Form. Using the ESAL counts and desired life, a value design is created using a mechanics-based determination of pavement responses, such as stresses, strains, and deflections due to loading and environmental influences.

DESIGN BANK TESTING

Because Resilient Modulus is a quantified analysis of the elastic modulus based on recoverable strain under repeated loading, the Resilient Modulus test result is used to support the mechanistic design requirement. However, in addition to the Resilient Modulus, completing a full bank of tests (Design Bank) with minimum results required for each test, helps provide a comprehensive view of long term performance expectations, particularly when permeability is included (as water entering the base is the number one reason for road failures). The Design Bank testing protocol helps ensure that your design meets minimum performance criteria across five test disciplines and exposes potential weak spots.

ROAD BASE PERFORMANCE TESTING SPECIFICATIONS GUIDE FOR COMPARISONS

Soil Test or Design Requirement in Design Bank	Protocol	Design Bank Minimum Requirement	LithTec™ Test Results for Your Traffic Design Needs	Alt. Product Test Results for Your Traffic Design Needs
Equivalent Single Axle Loads 18-kip (ESAL's) and Design Life	Flexible Pavement Design Resilient Modulus with Poisson Ratio Method			
California Bearing Ratio (CBR)	ASTM D1883-16 or AASHTO T193-13	100		
Permeability	ASTM D2434, ASTM D5084 or AASHTO T 215	10 ⁻⁷ cm/sec		
Resilient Modulus (M _R)	AASHTO T 307 or AASHTO T 208 Modulus Derivative	500,000 psi		
Unconfined Compressive Strength (UCS) Strain at Failure	ASTM D2166M-16 or AASHTO T 208-15	0.80%		
Unconfined Compressive Strength (UCS) Stress at Failure	ASTM D2166M-16 or AASHTO T 208-15	300 psi		

Call (505) 982-7444 for details.

AASHTO ESAL Client Form

Project Name:	
Project Number:	
Description:	
Prepared By:	Date:
Reference:	AASHTO Guide for Design of Pavement Structures 1993

Instructions:

For each Vehicle Description in Column (A), fill in (B) as the average estimated quantities of those vehicles in the design lane of traffic, fill in (C) as the average days per week that the average quantity from column (B) will be in design lane for each vehicle type, fill in (D) for the average weeks per year that traffic will be in the design lane and fill in (E) for the years for the design analysis period. Columns (F) and (G) are for reference only to help better describe each vehicle, and please put any notes for each vehicle type in (H), only as applicable or needed.

Questions or Help Needed? Please call Carlos Roybal Lithified Technologies Lab (505) 983.6573 off / 505.490.9313 cell or contact your authorized LithTec™ representative.

(A) Vehicle Description	(B) Traffic Volume			(E) Analysis Period (years)	(F) Axle Load and Type					(G) Gross Weight (pounds)	(H) Notes	
	Quantity in the Design Lane	(C) Days per Week	(D) Weeks per Year		Axle 1 (kips)	Axle 2 (kips)	Axle 3 (kips)					
Passenger car					2	S	2	S		4,000		
Pick-up truck or van					2	S	4	S		6,000		
Recreational vehicle					4	S	4	S		8,000		
School bus					2	S	4	S		6,000		
Public transit bus					8	S	14	S		22,000		
Greyhound MC-12 bus					13.4	S	18.4	S	6	S	37,800	
Package delivery truck					4	S	14	T		18,000		
Beverage delivery truck					6	S	12	S	12	S	30,000	
Garbage/dumpster truck					20	S	35	T		55,000		
Concrete truck (full)					20	S	48	R		68,000		
Dump truck (full)					20	S	48	R		68,000		
Semi-tractor (no trailer)					8	S	2	T		10,000		
Semi-tractor trailer					8	S	8	T	6	T	80,000	
Semi-tractor trailer (empty)					12	S	34	T	34	T	22,000	
Vehicle type H10					4	S	16	S		20,000		
Vehicle type H15					6	S	24	S		30,000		
Vehicle type H20					8	S	32	S		40,000		
Vehicle type 3					16	S	34	T		50,000		
Vehicle type HS15					6	S	24	S	24	S	54,000	
Vehicle type HS20					8	S	32	S	32	S	72,000	
Vehicle type 3S2					10	S	31	T	31	T	72,000	