

Date: August 13, 2024

Memorandum to: Douglas Wheatley, PE
HNTB North Carolina, P.C.

From: Abner F. Riggs, Jr., PE
Senior Geotechnical Engineer
Terracon Consultants, Inc.

State Project: 44691.1.1
TIP: R-5759
County: Wilkes
Description: Widening of NC 115 (Statesville Road) from US 421 to 2nd Street

Subject: Pavement Thickness Recommendations Revised

Terracon Consultants has completed the pavement thickness recommendations for the above referenced project. This memorandum presents our pavement thickness recommendations for the new travel lanes based on our pavement and subgrade investigation at the site and traffic data provided by HNTB. Terracon provided a Pavement and Subgrade Investigation Inventory report dated August 2020 under a separate cover.

Project Description

The project is located along NC 115 (Statesville Road) -L- from US 421 to 2nd Street west of Wilkesboro in Wilkes County, North Carolina. A portion of this project is within the municipal boundaries of the City of North Wilkesboro. The project has a total length of approximately 3.193 miles including the bridge crossing at US 421 and will consist of widening and improvements to the existing roadway.

Findings and Recommendations

The following presents our findings during the Pavement Design Investigation (PDI) and recommendations for minimum pavement sections based on the provided traffic data. Our analysis is based on the NCDOT Pavement Design Procedure AASHTO 1993 Method dated March 16, 2018. The design period used in our analysis is 20-years. Based on laboratory testing a design California Bearing Ratio (CBR) of 9.5 was used in our design.

Statesville Road (-L-) and Roundabouts (-C1-, -C2-, -C3- & -C4-)

Existing Statesville Road (-L-) is constructed of two to four-lane sections along the proposed widening alignment. At the intersection of US 421, Statesville Road consists of 3 lanes with a center turning lane and lane in each direction. Between Hunter Road and Armory Road, Statesville Road is constructed of two lanes with center turning lanes at major intersections of Speedway Road and Old US 421. Between Armory Road and 2nd Street, Statesville Road is constructed of 4 lanes with two lanes in each direction. During our field investigation of -L- we encountered approximately 7 to 15 inches of asphalt over varying depths of ABC of up to 15.5



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inches. Between approximately stations 64+50 -L- and 93+00 -L-, concrete was encountered underneath the asphalt pavement and observed to vary in thickness from approximately 6.5 to 7.5 inches. The route is classified as rural arterial and the provided traffic information for -L- is summarized below:

2018 ADT: 9,100

2040 ADT: 11,200

Duals: 4%

TTST: 4%

LINE	SURFACE	INTERMEDIATE	BASE	ABC
-L- from (10+25 to 24+01)	3.0" S9.5C*	2.5" I19.0C**	4.0" B25.0C	--
-L- from (24+01 to 171+11)***	3.0" S9.5C*	4.0" I19.0C**	4.0" B25.0C	--
-C1-, -C2-, -C3-, -C4-***	3.0" S9.5C*	4.0" I19.0C**	4.0" B25.0C	--

* To be laid in two separate 1.5- inch lifts.

** I19.0C may be substituted with B25.0C for narrow widening between existing pavement and the curb.

*** Curb and Gutter

US 421 Ramps and Loops (-RPB-, -LPB-, -RPD- & -LPD-)

The on and off ramps along US 421 and Statesville Road are constructed of one lane ramps with one turning lane in each direction for the off ramps at Statesville Road. During our investigation of -RPB- we encountered 8.5 inches of asphalt with 13.5 inches of ABC along the inside turning lane and approximately 11 to 11.5 inches of asphalt only along the outside turning lane. We recommend the following minimum pavement thickness for the loops and ramps:

LINE	SURFACE	INTERMEDIATE	BASE	ABC
-RPB- and -RPD-	3.0" S9.5C*	2.5" I19.0C**	4.0" B25.0C	--
-LPD- and -LPD-***	3.0" S9.5C*	4.0" I19.0C**	4.0" B25.0C	--

* To be laid in two separate 1.5- inch lifts.

** I19.0C may be substituted with B25.0C for narrow widening between existing pavement and the curb.

*** Curb and Gutter

Secondary -Y- Alignment Roadways

Secondary -Y- roads such as C.C. Wright School Road (-Y1-), Speedway Road (-Y4-), Old NC 60 (-Y7-), Old NC 421 (-Y10-) and Armory Road (-Y15-) connect to Statesville Road (-L-). These roads are two lane roads with <20,000 ADT. During our investigation of -Y4-, -Y7- and -Y15- we encountered 5.5 to 10.5 inches of asphalt with up to 8 inches of ABC. At station 13+75 (-Y4-) 7 inches of concrete was encountered underneath the asphalt pavement with no ABC stone. For the pavements constructed on new locations along these alignments the following pavement section may be used:

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LINE	SURFACE	INTERMEDIATE	BASE	ABC
C.C. Wright School Rd. -Y1- ***	3.0" S9.5C*	4.0" I19.0C**	4.0" B25.0C	--
School Service Rd. -Y2-, -Y2A-***	3.0" S9.5C*	4.0" I19.0C**	4.0" B25.0C	--
Speedway Rd. -Y4-	2.5" S9.5C*	--	4.0" B25.0C	--
Old NC 60 -Y7-	2.5" S9.5C*	--	4.0" B25.0C	--
Old NC 421 Rd. -Y10-	2.5" S9.5C*	--	4.0" B25.0C	--
Armory Rd -Y11- and -Y15-	2.5" S9.5C*	--	4.0" B25.0C	--

* To be laid in two separate lifts.

** I19.0C may be substituted with B25.0C for narrow widening between existing pavement and the curb.

*** Curb and Gutter

Low volume Secondary Roads

Secondary roads such as Hunter Road (-Y3- and -Y6-), Mimosa Lane (-Y5-), Damascus Church Road (-Y9-), Cedar Lane (-Y12-), Eastover Drive (-Y13-), Highland Drive (-Y14-) and Beech Street (-Y16-) have low traffic volumes. The following minimum section can be used on new location:

LINE	SURFACE	INTERMEDIATE	BASE	ABC
-Y3-, -Y5-, -Y6-, -Y9-, -Y14-, -Y16-	2.5" S9.5C*	--	4.0" B25.0C	--
-Y12- ** and -Y13- **	3.0" S9.5C*	--	4.0" B25.0C	--

* To be laid in two separate lifts.

** Curb and Gutter

Entrance Driveways

Entrance Driveways -DRW- alignments have traffic volumes of less than 100 ADT and one truck per day. The following section can be used for constructed on new location:

LINE	SURFACE	INTERMEDIATE	BASE	ABC
-DRW1-, -DRW3- and -DRW4-	2.5" S9.5C*	--	4.0" B25.0C	--
-DRW2- ***	3.0" S9.5C*	--	4.0" B25.0C	--
-DRW5- thru -DRW10- Unpaved	--	--	--	6.0" **

* To be laid in two separate lifts.

** Top 8 Inches of subgrade compacted to at least 100 percent of Standard Proctor

*** Curb and Gutter

Overlay

Based on our analysis, the sections of the existing asphalt pavement tested along Statesville Road (-L-) are sufficient to meet the minimum required structural number for the above recommended pavement section thicknesses. The majority of the existing pavement sections show low to moderate severity distress with a few localized moderate to high severity distressed areas. The highly distressed area in the right turn lane of the left lane located between approximately stations 26+60 and 30+60 -L- will need to be removed and replace with the recommended minimum pavement section. The 1.5 inches of S9.5B overlay currently shown in the project plans should be sufficient to restore rideability and extend the life of the pavement in the remaining areas. We understand that some variable depth profile milling may be needed prior to placing the overlay to maintain positive drainage and to achieve grade

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All asphalt pavement materials and construction procedures should conform to the 2018 NCDOT Standard Specifications for Roads and Structures.

We appreciate the opportunity to be of service to you on this project. If you have any questions or comments regarding this memorandum, please do not hesitate to contact us.

Sincerely,
Terracon Consultants, Inc.



Hugo Santana, PE
 Geotechnical Staff Engineer

Abner F. Riggs, Jr., PE
 Senior Geotechnical Engineer

Attachments: Pavement Thickness Recommendation Spread Sheets

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Project Description:

Spreadsheet verification
Route: NC115 -L- (1 LN / DIR)
County: Wilkes
Date: 8/18/2020

Division:11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	9,100	Proj. Yr. ADT:	11,200
% DUALS:	4	% TTST:	4
		Growth (%):	0.9

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	9,450	20 YEAR ADT=	11,413
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	0
DUAL FACT.:	0.3	TTST FACT:	0.95
		ADDITIONAL 18K:	0
DAILY 18K:	260	TOTAL 18K:	1,899,465

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.282	So, Standard Error	0.45
Daily 18K ESALs:	260	Total 18K:	1,899,465
Required SN:	3.36	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO / C & G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
2.5	I19.0B	0.44	1.1
4	B25.0B	0.30	1.2
0	ABC	0.14	0
SN =			3.62
Req'd =			3.36

Alternative 2 W/ C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
4	I19.0B	0.44	1.76
4	B25.0B	0.30	1.2
	ABC	0.14	0
SN =			4.28
Req'd =			3.36

Project Description:

Spreadsheet verification
Route: NC115 -L- (2 LN / DIR)
County: Wilkes
Date: 8/18/2020

Division:11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	9,100	Proj. Yr. ADT:	11,200
% DUALS:	4	% TTST:	4
		Growth (%):	0.9

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	9,450	20 YEAR ADT=	11,413
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	2	LANE DIST:	0.9
Rural/Urban:	U	Freeway/Other:	0
DUAL FACT.:	0.25	TTST FACT:	0.8
		ADDITIONAL 18K:	0
DAILY 18K:	197	TOTAL 18K:	1,435,996

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.282	So, Standard Error	0.45
Daily 18K ESALs:	197	Total 18K:	1,435,996
Required SN:	3.21	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	2.00	Paved Shoulder 18K	28,720
Paved Shoulder Req. SN	1.61	Seed Check:	0.081357362

Alternative 1 WO / C & G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
2.5	I19.0B	0.44	1.1
4	B25.0B	0.30	1.2
0	ABC	0.14	0
		SN =	3.62
		Req'd =	3.21

Alternative 2 W/ C & G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
4	I19.0B	0.44	1.76
4	B25.0B	0.30	1.2
	ABC	0.14	0
		SN =	4.28

Project Description: Spreadsheet verification
Route: Ramps /Loops
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	9,100	Proj. Yr. ADT:	11,200
% DUALS:	4	% TTST:	4
		Growth (%):	0.9

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	9,450	20 YEAR ADT=	11,413
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	F
DUAL FACT.:	0.3	TTST FACT:	1.15
		ADDITIONAL 18K:	0
DAILY 18K:	302	TOTAL 18K:	2,203,380

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.675	So, Standard Error	0.45
Daily 18K ESALs:	302	Total 18K:	2,203,380
Required SN:	3.68	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
2.5	I19.0B	0.44	1.1
4	B25.0B	0.30	1.2
0	ABC	0.14	0
		SN =	3.62
		Req'd =	3.68

Alternative 2 W/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
4	I19.0B	0.44	1.76
4	B25.0B	0.30	1.2
	ABC	0.14	0
		SN =	4.28

Project Description: Spreadsheet verification
Route: -Y1- &-Y2-
County: Wilkes
Date: 8/18/2020
TIP: R-5759

Division: 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	1,000	Proj. Yr. ADT:	1,200
% DUALS:	1	% TTST:	1
		Growth (%):	0.8

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	1,034	20 YEAR ADT=	1,220
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	0
DUAL FACT.:	0.3	TTST FACT:	0.95
		ADDITIONAL 18K:	0
DAILY 18K:	7	TOTAL 18K:	51,332

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M _R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.282	So, Standard Error	0.45
Daily 18K ESALs:	7	Total 18K:	51,332
Required SN:	1.84	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 W/C&G FULL DEPTH

Depth (in.)	Material	Layer Coeff.	Layer SN
2.5	S9.5B	0.44	1.1
0	I19.0C	0.44	0
4	B25.0C	0.30	1.2
0	ABC	0.14	0
SN =			2.30
Req'd =			1.84

Alternative 2 W/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
0	I19.0C	0.44	0
4	B25.0C	0.30	1.2
	ABC	0.14	0
SN =			2.52
Req'd =			1.84

Project Description:

Spreadsheet verification
Route: Hunter Rd -Y3-&-Y6-
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	400	Proj. Yr. ADT:	600
% DUALS:	1	% TTST:	0
		Growth (%):	1.8

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	431	20 YEAR ADT=	623
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	0
DUAL FACT.:	0.3	TTST FACT:	0.95
		ADDITIONAL 18K:	0
DAILY 18K:	1	TOTAL 18K:	5,705

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.282	So, Standard Error	0.45
Daily 18K ESALs:	1	Total 18K:	5,705
Required SN:	1.23	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
2.5	S9.5B	0.44	1.1
0	I19.0B	0.44	0
4	B25.0C	0.30	1.2
0	ABC	0.14	0
		SN =	2.30
		Req'd =	1.23

Project Description:

Spreadsheet verification
Route: Speedway Rd -Y4-
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	3,200	Proj. Yr. ADT:	3,900
% DUALS:	3	% TTST:	2
		Growth (%):	0.9

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	3,317	20 YEAR ADT=	3,971
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	0
DUAL FACT.:	0.3	TTST FACT:	0.95
		ADDITIONAL 18K:	0
DAILY 18K:	51	TOTAL 18K:	371,669

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.036	So, Standard Error	0.45
Daily 18K ESALs:	51	Total 18K:	371,669
Required SN:	2.46	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
3	S9.5B	0.44	1.32
0	I19.0B	0.44	0
4.5	B25.0C	0.30	1.35
0	ABC	0.14	0
		SN =	2.67
		Req'd =	2.46

Project Description:

Spreadsheet verification
Route: Old NC60 (SR 2318) -Y7-
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	2,200	Proj. Yr. ADT:	2,800
% DUALS:	2	% TTST:	1
		Growth (%):	1.1

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	2,299	20 YEAR ADT=	2,862
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	0
DUAL FACT.:	0.3	TTST FACT:	0.95
		ADDITIONAL 18K:	0
DAILY 18K:	20	TOTAL 18K:	145,500

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.036	So, Standard Error	0.45
Daily 18K ESALs:	20	Total 18K:	145,500
Required SN:	2.10	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
2.5	S9.5B	0.44	1.1
0	I19.0B	0.44	0
4	B25.0C	0.30	1.2
0	ABC	0.14	0
		SN =	2.30
		Req'd =	2.10

Project Description:

Spreadsheet verification
Route: Damascus Church Rd -Y9-
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	500	Proj. Yr. ADT:	700
% DUALS:	4	% TTST:	2
		Growth (%):	1.5

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	532	20 YEAR ADT=	722
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	0
DUAL FACT.:	0.3	TTST FACT:	0.95
		ADDITIONAL 18K:	0
DAILY 18K:	10	TOTAL 18K:	70,405

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.036	So, Standard Error	0.45
Daily 18K ESALs:	10	Total 18K:	70,405
Required SN:	1.86	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
2.5	S9.5B	0.44	1.1
0	I19.0B	0.44	0
4	B25.0C	0.30	1.2
0	ABC	0.14	0
		SN =	2.30
		Req'd =	1.86

Project Description:

Spreadsheet verification
Route: Old US 421 -Y10-
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	2,600	Proj. Yr. ADT:	3,200
% DUALS:	2	% TTST:	1
		Growth (%):	0.9

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	2,700	20 YEAR ADT=	3,261
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	R	Freeway/Other:	0
DUAL FACT.:	0.3	TTST FACT:	0.95
		ADDITIONAL 18K:	0
DAILY 18K:	23	TOTAL 18K:	168,238

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.036	So, Standard Error	0.45
Daily 18K ESALs:	23	Total 18K:	168,238
Required SN:	2.15	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
2.5	S9.5B	0.44	1.1
0	I19.0B	0.44	0
4	B25.0C	0.30	1.2
0	ABC	0.14	0
		SN =	2.30
		Req'd =	2.15

Project Description: Spreadsheet verification
Route: Armory Rd -Y11- & -Y15-
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	1,300	Proj. Yr. ADT:	1,700
% DUALS:	5	% TTST:	3
		Growth (%):	1.2

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	1,365	20 YEAR ADT=	1,742
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	U	Freeway/Other:	0
DUAL FACT.:	0.25	TTST FACT:	0.8
		ADDITIONAL 18K:	0
DAILY 18K:	28	TOTAL 18K:	206,083

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.036	So, Standard Error	0.45
Daily 18K ESALs:	28	Total 18K:	206,083
Required SN:	2.22	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
2.5	S9.5B	0.44	1.1
0	I19.0B	0.44	0
4	B25.0C	0.30	1.2
0	ABC	0.14	0
		SN =	2.30
		Req'd =	2.22

Project Description:

Spreadsheet verification
Route: Highland Dr -Y14-
County: Wilkes
Date: 8/18/2020

Division 11

TRAFFIC DATA

Initial Year:	2018	Projection Year:	2040
Initial Year ADT:	300	Proj. Yr. ADT:	500
% DUALS:	1	% TTST:	0
		Growth (%):	2.3

DESIGN PARAMETERS

Construction Year:	2022	Des. Life (Years):	20
Constr. Year ADT:	329	20 YEAR ADT=	524
DIR %:	50	TERM. SI:	2.5
LANES/DIRECT:	1	LANE DIST:	1
Rural/Urban:	U	Freeway/Other:	0
DUAL FACT.:	0.25	TTST FACT:	0.8
		ADDITIONAL 18K:	0
DAILY 18K:	1	TOTAL 18K:	3,826

ADDITIONAL ESAL CALCULATIONS**

TTST		Duals	
Trucks Per Day	0	Trucks Per Day	0
Trucks Per Year	0	Trucks Per Year	0
Years	20	Years	20
Total TTST	0	Total Dual	0
ESALs	0	ESALs	0

** (Useful if you expect additional trucks to enter the system that are not accounted for in traffic counts, but for which you can obtain an estimate of the additional trucks per day generated by the facility. For instance, a new quarry or distribution center would dramatically increase the ESAL count)

SOILS & REGIONAL DATA

Soil Support Value:	3.71	CBR:	9.5
Resilient Modulus, M_R (psi)	10792.8	Additional 18K:	0
Zr, Std. Norm. Dev.	-1.036	So, Standard Error	0.45
Daily 18K ESALs:	1	Total 18K:	3,826
Required SN:	1.08	Seed Check:	OK

PAVED SHOULDER

% Thru Traffic	Paved Shoulder 18K	-
Paved Shoulder Req. SN	Seed Check:	#NUM!

Alternative 1 WO/C&G

Depth (in.)	Material	Layer Coeff.	Layer SN
2.5	S9.5B	0.44	1.1
0	I19.0B	0.44	0
4	B25.0C	0.30	1.2
0	ABC	0.14	0
		SN =	2.30
		Req'd =	1.08