## Errata Sheet for NCHRP Web-Only Document 235

## Quantifying the Influence of Geosynthetics on Pavement Performance

Page No.	Original	Corrected	
C-3	(Table C-2 footnote) <sup>a</sup> "Sheet stiffness corresponding to 2 percent tensile strain."	<sup>a</sup> "Tensile sheet stiffness values are at 0.5% tensile strain for TX geogrid and at 2% tensile strain for BX geogrid."	
Q-1	It can be observed from Figure Q-3 that the subgrade modulus has been increased from 5.0 ksi to 11.9 ksi with placing the geogrid at the bottom of the base course.	It can be observed from Figure Q-3 that the subgrade modulus has been increased from 5.0 ksi to 13.1 ksi and base modulus has been increased from 20.0 ksi to 22.5 ksi with placing the geogrid at the bottom of the base course.	
Q-2	Premeent M.E. Design with Geosynthetics       -       *         Geosynthetics Location       Pavemeent Structure         HMA Thickness (in)       12         Geogrid at the Botton       Base Thickness (in)         Geotextile at the Middle       Base Modulus (ksi)         Geotextile at the Bottom       Geosynthetic Sheet Stiffness (ksi)         Run Analysis       Exit	Conductive Geosynthetics Location       Pavement Structure         Geosynthetics Location       Pavement Structure         Base Course       10         Geogrid in the Middle of       Base Thickness (in)         Base Course       10         Geotextile at the Bottom of       Base Anisotropic Ratio         Base Course       0.35         Geotextile in the Middle of       Base Anisotropic Ratio         Base Course       0.35         Geotextile in the Middle of       Base Anisotropic Ratio         Base Course       0.35         Geotextile in the Middle of       Base Anisotropic Ratio         Base Course       0.35         Base Course       Subgrade Modulus (ksi)         Subgrade Modulus (ksi)       5         Subgrade Modulus (ksi)       5         Stude Course       Exit	

Page No.	Original	Corrected	
Q-3	Resultskit - Notepad       -       ×         File Edit Format View Help       Unreinforced Pavement Structure       .       .         1. Compressive strain at bottom of base:1711.82       .       .       .         2. Average strain in the base:1192.74       .       .       .       .         3. Tensile strain at bottom of HMA surface:553.56       .       .       .       .         With Geogrid at the Bottom       .	Results bt - Notepad         File Edit Format View Help         Unreinforced Pavement Structure         1. Compressive strain at bottom of base:1438.37         2. Average strain in the base:959.54         3. Tensile strain at bottom of HMA surface:501.54         With Geogrid at the Bottom         1. Compressive strain at bottom of base:838.91         2. Average strain in the base:927.10         3. Tensile strain at bottom of HMA surface:491.24         Subgrade modulus with unreinforced pavement structure:5.0(ksi)         Modified subgrade modulus:13.1(ksi)         Base modulus with unreinforced pavement structure:20.0(ksi)         Modified base modulus:22.5(ksi)	
Q-3	The "Results" file will then open up, as shown in Figure Q-6, which indicates that the subgrade modulus has been increased from 5.0 ksi to 5.5 ksi with a geogrid layer in the middle of the base course.	The "Results" file will then open up, as shown in Figure Q-6, which indicates that the base modulus has been increased from 20.0 ksi to 20.8 ksi with a geogrid layer in the middle of the base course.	

Page No.	Original	Corrected
	Prevement M-E Design with Geosynthetics     -      ×	Composite Geosynthetic-Basis Course Model
Q-4	O Geogrid at the Botton HMA Thickness (in) 4 Base Thickness (in) 10	Geogrid at the Bottom of Base Course Base Thickness (in) 10
	Geogrid at the Middle     HMA Modulus (ksi)     300     Base Modulus (ksi)     20	Geogrid in the Middle of Base Course     Base Modulus (ksi)     20
	Geotextile at the Bottom     Base Anisotropic Ratio     0.35     Geosynthetic Sheet Stiffness (ks)     30	Geotextile at the Bottom of Base Course     Base Anisotropic Ratio     0.35       Geosynthetic Sheet Stiffness (lb/in)     1200
	O Geotextile at the Middle     Subgrade Modulus (ksi)	Geotextile in the Middle of Subgrade Modulus (ksi) 5
	Run Analysis Exit Figure Q-5. Select "Geogrid in the Middle" and Input	Run Analysis Exit Figure Q-5. Select "Geogrid in the Middle" and Input
	Resultstst - Notepad       -       X         File Edit Format View Help       Unreinforced Pavement Structure       .         1. Compressive strain at bottom of base:1544.17       .       .         3. Tensile strain at bottom of HMA surface:508.68       .       .	Results.bt - Notepad         File Edit Format View Help         Unreinforced Pavement Structure         1. Compressive strain at bottom of base:1438.37         2. Average strain in the base:959.54         3. Tensile strain at bottom of HMA surface:501.54
0-5	With Geogrid at the Middle 1. Compressive strain at bottom of base:1497.32 2. Average strain in the base:886.24 3. Tensile strain at bottom of HWA surface:494.93	With Geogrid at the Middle 1. Compressive strain at bottom of base:1514.24 2. Average strain in the base:855.71 3. Tensile strain at bottom of HMA surface:483.24
Q-3	Base modulus with unreinforced pavement structure:20.0(ksi) Modified base modulus:20.0(ksi) Subgrade modulus with unreinforced pavement structure:5.0(ksi) Modified subgrade modulus:5.5(ksi)	Base modulus with unreinforced pavement structure:20.0(ksi) Modified base modulus:20.8(ksi) Subgrade modulus with unreinforced pavement structure:5.0(ksi) Modified subgrade modulus:5.0(ksi)
	Figure Q-6. Analysis Results for Example 2	Figure Q-6. Analysis Results for Example 2

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Q-5	As can been seen from the "Results" file (see Figure Q-9), the subgrade modulus has been increased from 5.0 ksi to 14.6 ksi when placing the geotextile layer at the bottom of the base course.		As can been seen from th subgrade modulus has be when placing the geotext course.	e "Results" file (see F en increased from 5.0 ile layer at the bottom	Figure Q-9), the ksi to 7.7 ksi of the base	
	Pavement M-E Design with Geosynthetics		- 0 X	G Composite Georgethetic-Base Course Model		
	Geosynthetics Location	Pavement Structure		Geosynthetics Location	Pavement Structure	
	• Geogrid at the Botton	HMA Thickness (in)	5	Geogrid at the Bottom of	HMA Thickness (in)	5
	• Geogrid at the Middle	Base Thickness (in) HMA Modulus (ksi)	300	Geogrid in the Middle of Base Course	Base Thickness (in) HMA Modulus (ksi)	300
		Base Modulus (ksi)	20		Base Modulus (ksi)	20
	Geotextile at the Bottom	Base Anisotropic Ratio	0.35	Geotextile at the Bottom of Base Course	Base Anisotropic Ratio	0.35
Q-6	O Geotextile at the Middle	Geosynthetic Sheet Stiffness (ksi) Subgrade Modulus (ksi)	30 5	Geotextile in the Middle of Base Course	Geosynthetic Sheet Stiffness (lb/in) Subgrade Modulus (ksi)	1200           5
	Run Analysis	Exit		Run Analysis	Exit	
	Figure Q-8. Select "( M	Geotextile at the Bott aterial Properties	om" and Input	Figure Q-8. Select "C Ma	Geotextile at the Bott aterial Properties	tom" and Input

Page No.	Original	Corrected	
Q-7	Resultsst - Notepad       -       ×         File Edit Format View Help       Unreinforced Pavement Structure       .       .         1. Compressive strain at bottom of base:1083.07       .       .       .         2. Average strain in the base:685.97       .       .       .       .         3. Tensile strain at bottom of HMA surface:410.45       . </th <th>File Edit Format View Help         Unreinforced Pavement Structure         1. Compressive strain at bottom of base:991.82         2. Average strain in the base:662.63         3. Tensile strain at bottom of HMA surface:416.53         With Geotextile at the Bottom         1. Compressive strain at bottom of base:508.09         2. Average strain in the base:776.47         3. Tensile strain at bottom of HMA surface:430.38         Subgrade modulus with unreinforced pavement structure:5.0(ksi)         Modified subgrade modulus:7.7(ksi)         Base modulus with unreinforced pavement structure:20.0(ksi)         Modified base modulus:20.0(ksi)</th>	File Edit Format View Help         Unreinforced Pavement Structure         1. Compressive strain at bottom of base:991.82         2. Average strain in the base:662.63         3. Tensile strain at bottom of HMA surface:416.53         With Geotextile at the Bottom         1. Compressive strain at bottom of base:508.09         2. Average strain in the base:776.47         3. Tensile strain at bottom of HMA surface:430.38         Subgrade modulus with unreinforced pavement structure:5.0(ksi)         Modified subgrade modulus:7.7(ksi)         Base modulus with unreinforced pavement structure:20.0(ksi)         Modified base modulus:20.0(ksi)	
Q-7	As shown in Figure Q-12, the "Results" file indicates that placing a geotextile layer in the middle of the base course in fact decreases the modulus of the base course from 30.0 ksi to 27.0 ksi.	As shown in Figure Q-12, the "Results" file indicates that placing a geotextile layer in the middle of the base course in fact decreases the modulus of the base course from 40.0 ksi to 26.2 ksi.	

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	静 Pavement M-E Design with Georynthetics - ロ X	Composite Grosysthetic-Base Course Model
Q-8	Geosynthetics Location Pavement Structure HMA Thickness (in) 4 Geogrid at the Botton	Geosynthetics Location Pavement Structure Geogrid at the Bottom of Pare Thickness (in) 4
	Geogrid at the Middle     Base Thickness (in)     9       Base Modulus (ksi)     300       Base Modulus (ksi)     30	Geogrid in the Middle of Base Course     HMA Modulus (ksi)     300       Base Course     Base Modulus (ksi)     40
	O Geotextile at the Bottom Base Anisotropic Ratio 0.35	Geotextile at the Bottom of Base Anisotropic Ratio
	Geosynthetic Sheet Stiffness (ksi)     30             Geotextile at the Middle          Subgrade Modulus (ksi)            5	Geosynthetic Sheet Stiffness (lb/in) 1200 Geosynthetic Sheet Stiffness (lb/in) 5 Base Course 5
	Run Analysis Exit	Run Analysis Exit
	Figure Q-11. Select "Geotextile in the Middle" and Input Material Properties	Figure Q-11. Select "Geotextile in the Middle" and Input Material Properties
	Results.txt - Notepad     -      X      File Edit Format View Help	Results.but - Notepad
Q-9	Unreinforced Pavement Structure 1. Compressive strain at bottom of base:1659.46 2. Average strain in the base:781.50 3. Tensile strain at bottom of HMA surface:452.02	Unreinforced Pavement Structure 1. Compressive strain at bottom of base:1490.94 2. Average strain in the base:604.16 3. Tensile strain at bottom of HMA surface:362.33
	With Geotextile at the Middle 1. Compressive strain at bottom of base:1591.40 2. Average strain in the base:895.61 3. Tensile strain at bottom of HMA surface:528.65	With Geotextile at the Middle 1. Compressive strain at bottom of base:1290.59 2. Average strain in the base:588.96 3. Tensile strain at bottom of HMA surface:528.62
	Base modulus with unreinforced pavement structure:30.0(ksi) Modified base modulus:27.0(ksi)	Base modulus with unreinforced pavement structure:40.0(ksi) Modified base modulus:26.2(ksi)
	Figure Q-12. Analysis Results for Example 4	Figure Q-12. Analysis Results for Example 4