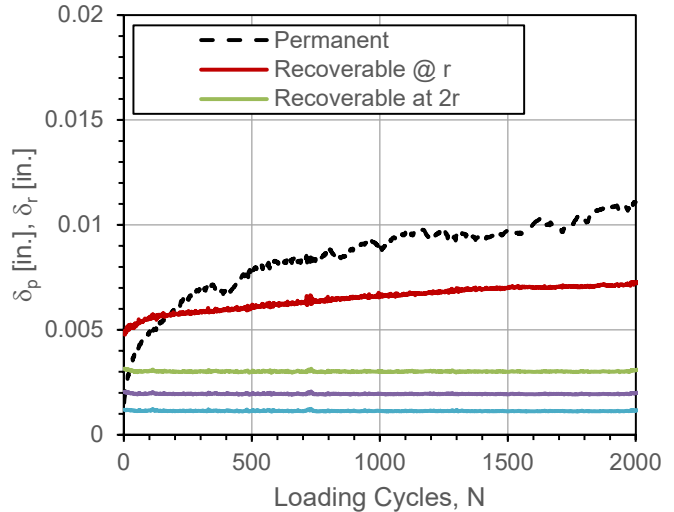
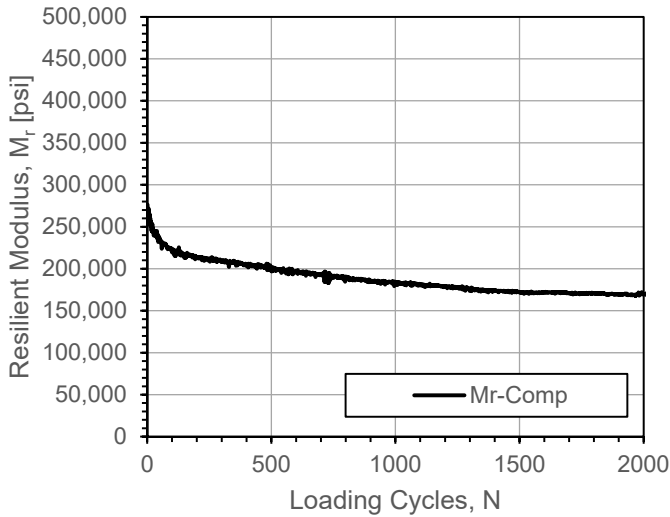


Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	11:17:16 AM	Test ID	PT4_Control
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1140+47
Latitude,N:	42.49749333	Longitude,W:	-91.91978333	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. Control section - no geotextile at the interface.				
Pavement surface temperature at the time of test = 74.8°F					



$\sigma_{cyclic} =$ 90.2 psi

Plate Dia. = 12.0 in.

Permanent Deformation Prediction Parameters

$C =$ 0.0015

$d =$ 0.2613

$R^2 =$ 0.984

$N^* =$ 3,191 Cycles

δ_p at $N^* =$ 0.0122 in.

Adj. δ_p at $N^* =$ 0.0107 in.

Model: $\delta_p = CN^d$

δ_p = permanent deformation

C = plastic deformation after first cycle

d = scaling component

N = Number of loading cycles

N^* = Number of loading cycles at $\Delta\delta_p = 1E-06$ in./cycle

Adj. δ_p at $N^* = \delta_p$ at $N^* - C$

N_x = Number of loading cycles to achieve δ_p of x in.

In-situ Composite Resilient Modulus [950-1000 cycles]

$M_{r-comp} =$ 183,816 psi

Max. $\delta_p =$ 0.011 in.

In-situ Test Results: Resilient Modulus and Deformations

Project Name:	Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
Project ID:	ISP_00010
Location:	D16, Buchanan County, IA



Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	11:17:16 AM	Test ID	PT4_Control
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1140+47
Latitude,N:	42.49749333	Longitude,W:	-91.91978333	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. Control section - no geotextile at the interface.				
Pavement surface temperature at the time of test = 74.8oF					

Cycle	Stress, σ (psi)	AREA, A_3 (in.)	L_{est} (in.)	L_{adj} (in.)	k_{static} (psi/in)	* $k_{static-corr}$ (psi/in)	E_{PCC} (psi)
1	95	16.0	19.2	19.1	361.2	380.9	2,734,945
10	96	16.1	19.3	19.2	340.8	359.8	2,642,662
100	92	16.1	19.4	19.2	301.4	318.3	2,360,130
2000*	91	16.0	19.1	19.0	234.0	246.6	1,744,572

*average of 1950-2000 cycles

k_{static} = 1/2 of $k_{dynamic}$ value

Structural Design Parameters - 18-kip ESWL

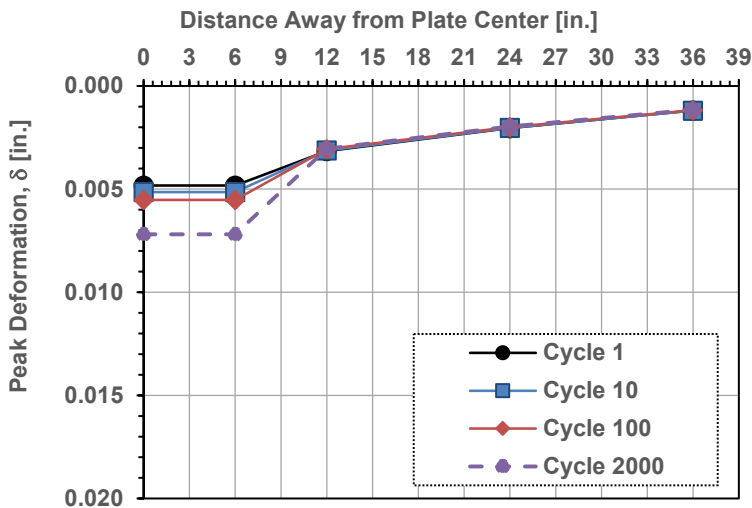
$$k\text{-value} = \boxed{247} \text{ psi/in}$$

$$E_{PCC} = \boxed{1,744,572} \text{ psi}$$

Note: k-value and E_{PCC} at 1000 cycles

* k_{corr} = Corrected k-values for finite slab size (assumed as 11.25 ft wide), per Croveti (1993)

k_{static} = k-values determined from cyclic PLT are divided by an empirical factor of 2, per AASHTO (1993).



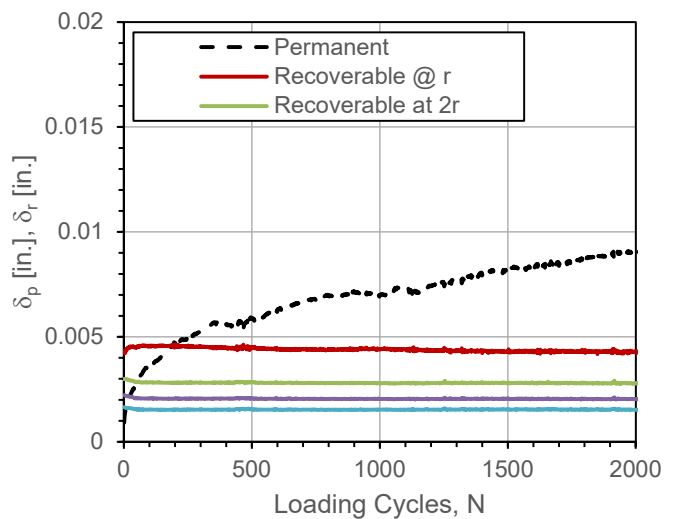
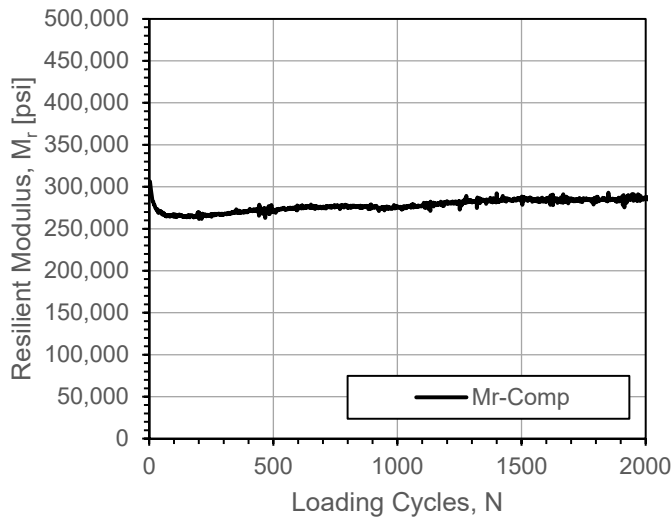
In-situ Test Results: k-value and E_{PCC}

Project Name: Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
 Project ID: ISP_00010
 Location: D16, Buchanan County, IA



Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	1:39:58 PM	Test ID	PT5_Std. Black
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1162+00
Latitude,N:	42.49759500	Longitude,W:	-91.91174333	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. Standard Black geotextile interlayer between the PCC overlay and the underlying existing ACC. Pavement surface temperature at the time of test = 86.7°F				



$\sigma_{cyclic} =$ 90.6 psi

Plate Dia. = 12.0 in.

Permanent Deformation Prediction Parameters

$C =$ 0.0009

$d =$ 0.3013

$R^2 =$ 0.992

$N^* =$ 3,071 Cycles

δ_p at $N^* =$ 0.0102 in.

Adj. δ_p at $N^* =$ 0.0093 in.

Model: $\delta_p = CN^d$

δ_p = permanent deformation

C = plastic deformation after first cycle

d = scaling component

N = Number of loading cycles

N^* = Number of loading cycles at $\Delta\delta_p = 1E-06$ in./cycle

Adj. δ_p at $N^* = \delta_p$ at $N^* - C$

N_x = Number of loading cycles to achieve δ_p of x in.

In-situ Composite Resilient Modulus [950-1000 cycles]

$M_{r-comp} =$ 275,317 psi

Max. $\delta_p =$ 0.009 in.

In-situ Test Results: Resilient Modulus and Deformations

Project Name:	Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
Project ID:	ISP_00010
Location:	D16, Buchanan County, IA



Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	1:39:58 PM	Test ID	PT5_Std. Black
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1162+00
Latitude,N:	42.49759500	Longitude,W:	-91.91174333	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. Standard Black geotextile interlayer between the PCC overlay and the underlying existing ACC. Pavement surface temperature at the time of test = 86.7oF				

Cycle	Stress, σ (psi)	AREA, A_3 (in.)	L_{est} (in.)	L_{adj} (in.)	k_{static} (psi/in)	* $k_{static-corr}$ (psi/in)	E_{PCC} (psi)
1	97	18.2	25.3	24.7	245.4	278.5	5,599,768
10	93	18.0	24.7	24.1	240.4	270.5	4,976,927
100	90	18.0	24.7	24.1	223.3	251.3	4,625,774
2000*	91	18.1	24.8	24.3	237.2	267.5	5,034,138

*average of 1950-2000 cycles

$k_{static} = 1/2$ of $k_{dynamic}$ value

Structural Design Parameters - 18-kip ESWL

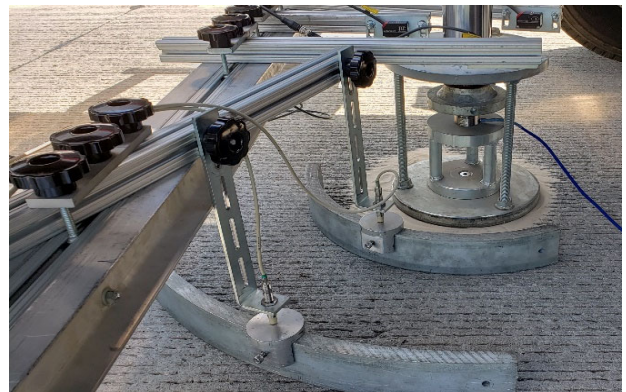
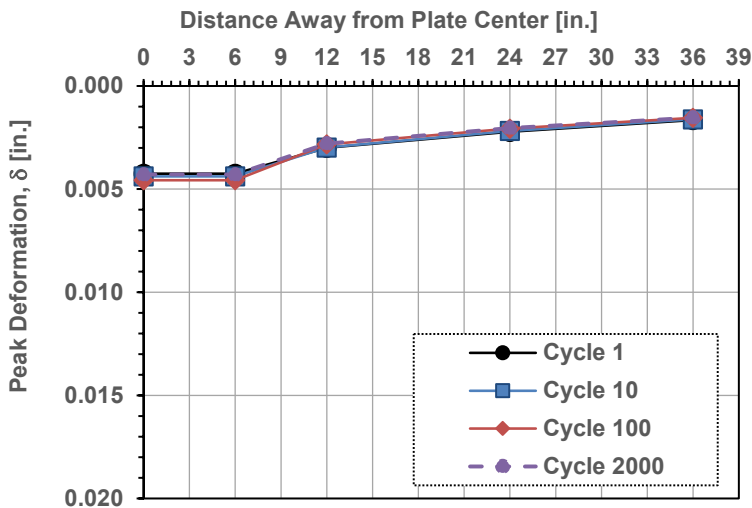
$$k\text{-value} = \boxed{267} \text{ psi/in}$$

$$E_{PCC} = \boxed{5,034,138} \text{ psi}$$

Note: k-value and E_{PCC} at 1000 cycles

* k_{corr} = Corrected k-values for finite slab size (assumed as 11.25 ft wide), per Croveti (1993)

k_{static} = k-values determined from cyclic PLT are divided by an empirical factor of 2, per AASHTO (1993).



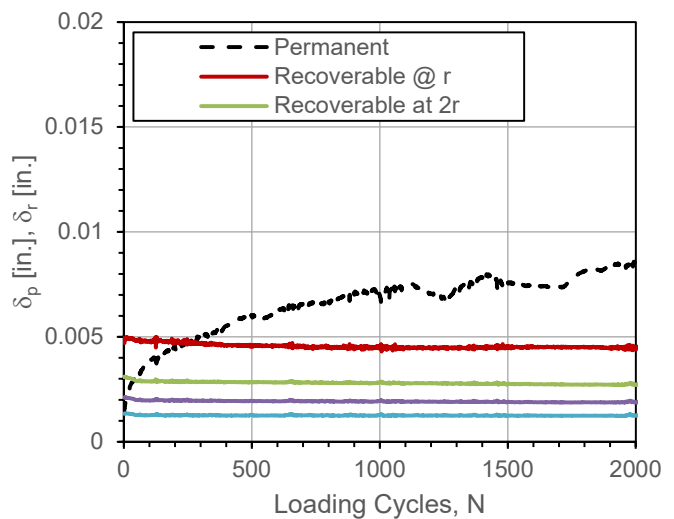
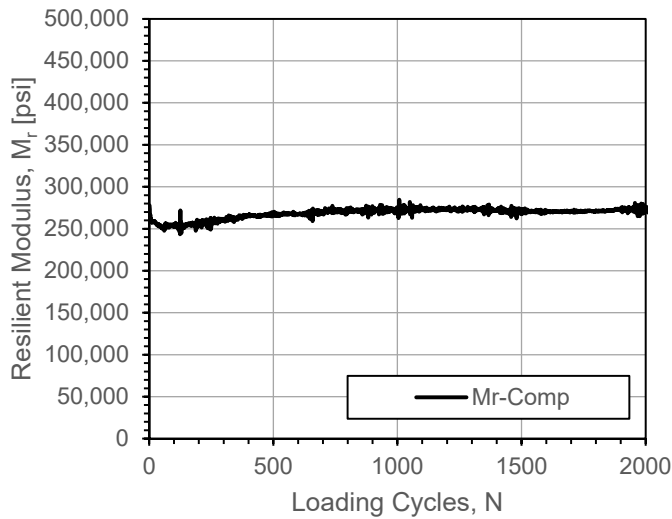
In-situ Test Results: k-value and E_{PCC}

Project Name: Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
 Project ID: ISP_00010
 Location: D16, Buchanan County, IA



Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	2:43:44 PM	Test ID	PT7_Thin Black
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1175+00
Latitude,N:	42.49766833	Longitude,W:	-91.90691000	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. Thin Black geotextile interlayer between the PCC overlay and the underlying existing ACC. Pavement surface temperature at the time of testing = 90.6°F				



$\sigma_{cyclic} =$ 91.1 psi

Plate Dia. = 12.0 in.

Permanent Deformation Prediction Parameters

$C =$ 0.0012

$d =$ 0.2585

$R^2 =$ 0.982

$N^* =$ 2,203 Cycles

$\delta_p \text{ at } N^* =$ 0.0085 in.

Adj. $\delta_p \text{ at } N^* =$ 0.0074 in.

Model: $\delta_p = CN^d$

δ_p = permanent deformation

C = plastic deformation after first cycle

d = scaling component

N = Number of loading cycles

N^* = Number of loading cycles at $\Delta\delta_p = 1E-06$ in./cycle

Adj. $\delta_p \text{ at } N^* = \delta_p \text{ at } N^* - C$

N_x = Number of loading cycles to achieve δ_p of x in.

In-situ Composite Resilient Modulus [950-1000 cycles]

$M_{r-comp} =$ 272,237 psi

Max. $\delta_p =$ 0.009 in.

In-situ Test Results: Resilient Modulus and Deformations

Project Name:	Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
Project ID:	ISP_00010
Location:	D16, Buchanan County, IA



Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	2:43:44 PM	Test ID	PT7_Thin Black
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1175+00
Latitude,N:	42.49766833	Longitude,W:	-91.90691000	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. Thin Black geotextile interlayer between the PCC overlay and the underlying existing ACC. Pavement surface temperature at the time of testing = 90.6oF				

Cycle	Stress, σ (psi)	AREA, A_3 (in.)	L_{est} (in.)	L_{adj} (in.)	k_{static} (psi/in)	* $k_{static-corr}$ (psi/in)	E_{PCC} (psi)
1	96	16.9	21.2	20.9	309.3	332.9	3,473,228
10	96	16.9	21.3	21.0	289.0	311.4	3,298,610
100	90	16.9	21.2	20.9	285.2	307.0	3,205,273
2000*	91	17.1	21.8	21.5	293.8	318.3	3,671,562

*average of 1950-2000 cycles

$k_{static} = 1/2$ of $k_{dynamic}$ value

Structural Design Parameters - 18-kip ESWL

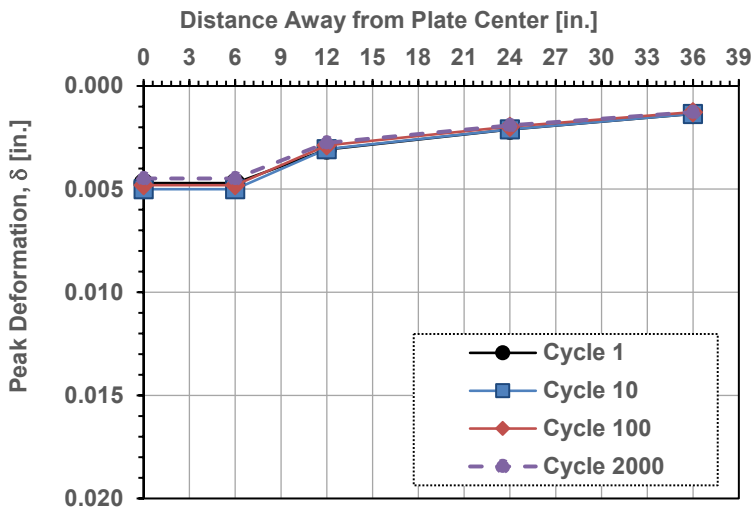
$$k\text{-value} = \boxed{318} \text{ psi/in}$$

$$E_{PCC} = \boxed{3,671,562} \text{ psi}$$

Note: k-value and E_{PCC} at 1000 cycles

* k_{corr} = Corrected k-values for finite slab size (assumed as 11.25 ft wide), per Croveti (1993)

k_{static} = k-values determined from cyclic PLT are divided by an empirical factor of 2, per AASHTO (1993).



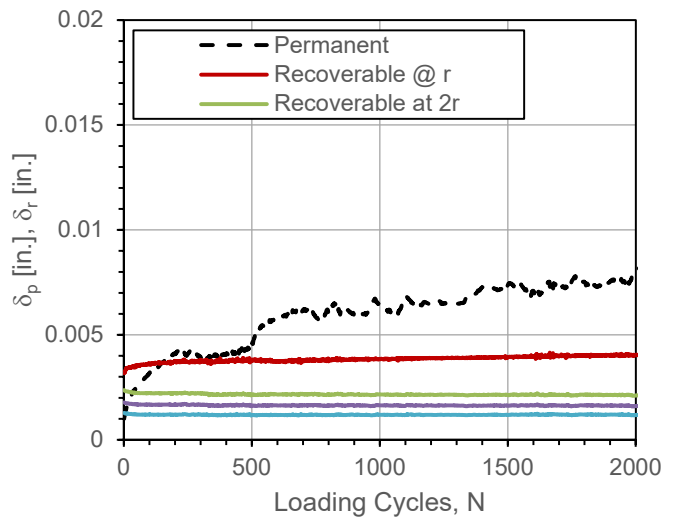
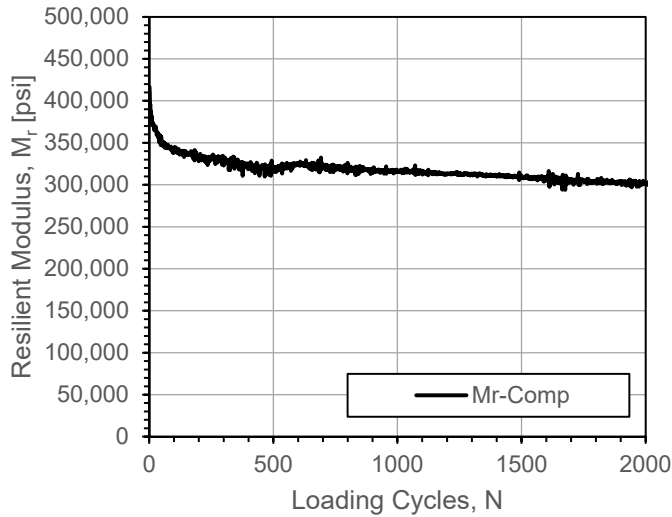
In-situ Test Results: k-value and E_{PCC}

Project Name: Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
 Project ID: ISP_00010
 Location: D16, Buchanan County, IA



Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	12:33:35 PM	Test ID	PT1_White GT
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1156+35
Latitude,N:	42.49755833	Longitude,W:	-91.91384333	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. White geotextile interlayer between the PCC overlay and the underlying existing ACC. Pavement surface temperature at the time of testing = 86.1°F				



$\sigma_{cyclic} =$ 90.6 psi

Plate Dia. = 12.0 in.

Permanent Deformation Prediction Parameters

$C =$ 0.0007

$d =$ 0.3086

$R^2 =$ 0.961

$N^* =$ 2,593 Cycles

$\delta_p \text{ at } N^* =$ 0.0084 in.

Adj. $\delta_p \text{ at } N^* =$ 0.0077 in.

Model: $\delta_p = CN^d$

δ_p = permanent deformation

C = plastic deformation after first cycle

d = scaling component

N = Number of loading cycles

N^* = Number of loading cycles at $\Delta\delta_p = 1E-06$ in./cycle

Adj. $\delta_p \text{ at } N^* = \delta_p \text{ at } N^* - C$

N_x = Number of loading cycles to achieve δ_p of x in.

In-situ Composite Resilient Modulus [950-1000 cycles]

$M_{r-comp} =$ 316,552 psi

Max. $\delta_p =$ 0.008 in.

In-situ Test Results: Resilient Modulus and Deformations

Project Name:	Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
Project ID:	ISP_00010
Location:	D16, Buchanan County, IA



Automated Plate Load Test [APLT]

Test:	In-situ Cyclic Plate Load Test: Single Stress, 12 in. diameter loading plate				
Date:	9/1/2021	Time:	12:33:35 PM	Test ID	PT1_White GT
Tested By	DW, HG	Location:	D16, WB Lane	Sta.	1156+35
Latitude,N:	42.49755833	Longitude,W:	-91.91384333	Elev. (ft):	NA
Comments:	Nominal 6 in. PCC overlay on nominal 12 in. ACC. White geotextile interlayer between the PCC overlay and the underlying existing ACC. Pavement surface temperature at the time of testing = 86.1oF				

Cycle	Stress, σ (psi)	AREA, A_3 (in.)	L_{est} (in.)	L_{adj} (in.)	k_{static} (psi/in)	* $k_{static-corr}$ (psi/in)	E_{PCC} (psi)
1	97	18.3	25.7	25.0	317.2	362.0	7,666,618
10	95	18.3	25.8	25.1	286.0	326.9	7,053,106
100	92	18.4	26.0	25.3	260.7	299.0	6,658,043
2000*	91	18.5	26.4	25.7	222.1	256.3	6,024,770

*average of 1950-2000 cycles

$k_{static} = 1/2$ of $k_{dynamic}$ value

Structural Design Parameters - 18-kip ESWL

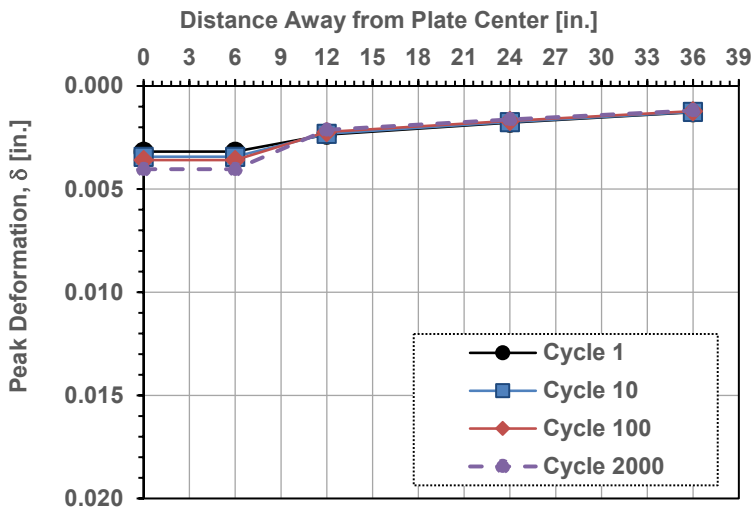
$$k\text{-value} = \boxed{256} \text{ psi/in}$$

$$E_{PCC} = \boxed{6,024,770} \text{ psi}$$

Note: k-value and E_{PCC} at 1000 cycles

* k_{corr} = Corrected k-values for finite slab size (assumed as 11.25 ft wide), per Croveti (1993)

k_{static} = k-values determined from cyclic PLT are divided by an empirical factor of 2, per AASHTO (1993).



In-situ Test Results: k-value and E_{PCC}

Project Name: Concrete Pavement Overlays Supported on Geotextile and Asphalt Interlayers
 Project ID: ISP_00010
 Location: D16, Buchanan County, IA

