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FY 2022 Webinar #3
Composite Pavement Design and the AASHTOWare PMED Software
May 26, 2022

FY 2022 Webinar #3, Composite Pavement Design

Moderator:

- Clark Morrison, North Carolina Department of Transportation; Chair
- Hari Nair, Virginia Department of Transportation; Co-chair

Presenters:

- Wouter Brink, ARA
- Harold Von Quintus, ARA

Presentation will be available for viewing on the ME-Design Resource website:

http://www.me-design.com

Pavement ME Task Force Members

1. Ryan Fragapane, AASHTO Project Manager
2. Clark Morrison, PE, North Carolina DOT, Chair
3. Hari Nair, PE, Virginia DOT, Vice-Chair
4. Patrick Bierl, PE, Ohio DOT
5. Susanne Chan, Ontario MOT, TAC Liaison
6. Kumar Dave, PE, Indiana DOT
7. Felix Doucet, Eng., Quebec MOT
8. Dulce Feldman, PE, California DOT
9. Ian Rish, PE, Georgia DOT
10. Tom Yu, PE, FHWA Liaison

FY 2022 Webinar #3, Composite Pavement Design

- Phones are being muted.
- Please post your questions in the Q&A box. This can be accessed by clicking on the WebEx Q&A button.
- The presenters will answer all questions at the end of the webinar/demonstration as time permits.
- Questions not answered, because of time, will be responded to separately.

FY 2022 Webinar #3 Composite Pavement Design

Poll 1: Questions 1, 2, and 3

1. How many individuals are viewing this webinar at your location?
   - ❑ 1
   - ❑ 2
   - ❑ 3 to 5
   - ❑ More than 5

2. What is your affiliation?
   - ❑ State Government
   - ❑ Federal Government
   - ❑ Contractor/Association
   - ❑ Consultant
   - ❑ Academia

3. Have you designed NEW composite pavements?
   - ❑ Our agency/organization does not build this type of new pavement design strategy.
   - ❑ No
   - ❑ Yes

Prerequisites for this Webinar

Prior experience with:

- PMED software for new and rehabilitation design of flexible and rigid pavements.

Learning Outcomes

1. Define new “composite pavements” for use in a new design strategy within the PMED software.
2. List and explain the assumptions for new composite pavement designs in the PMED software.
3. Identify the inputs needed to simulate new composite pavements.
4. Describe the main engineering points that engineers should consider in designing new composite pavements.

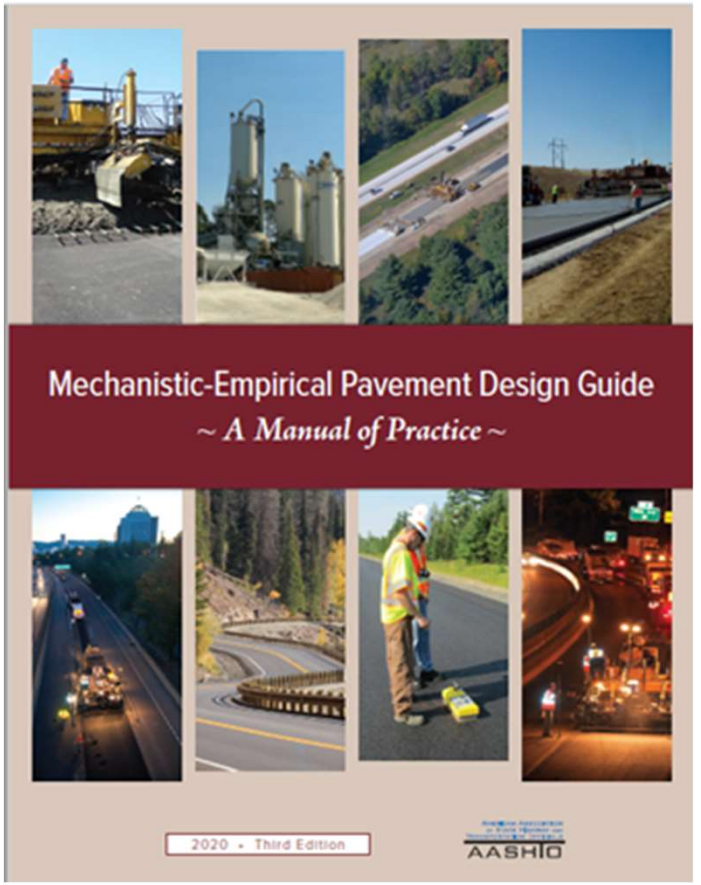
FY 2022 – Webinar #3: Composite Pavement Design

Webinar Outline:

1. New Composite Pavements Defined
2. Designing New Composite Pavements
3. Assumptions and Inputs
4. Summary and Takeaway Comments
5. Question and Answer Session

Introduction Statement

Many agencies define composite pavements as an asphalt overlay of a rigid pavement.



That definition is NOT the content of this webinar. The webinar content is for new asphalt layers over recently placed PCC layers, as a type of composite pavement.

AASHTOWare Pavement ME Design
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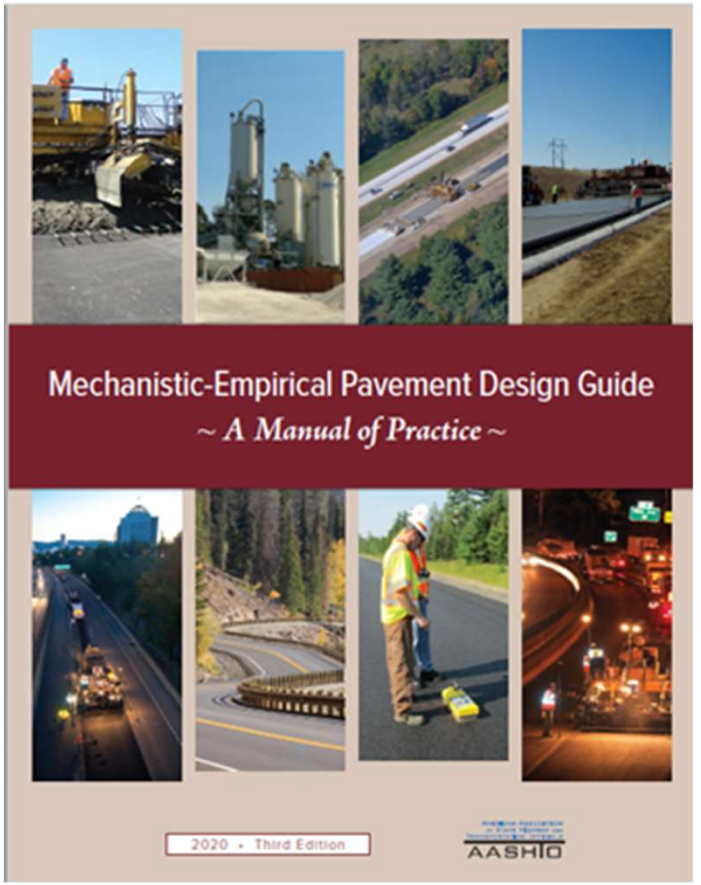
New Composite Pavements Defined

MEPDG Manual of Practice, Under Section 3.3:

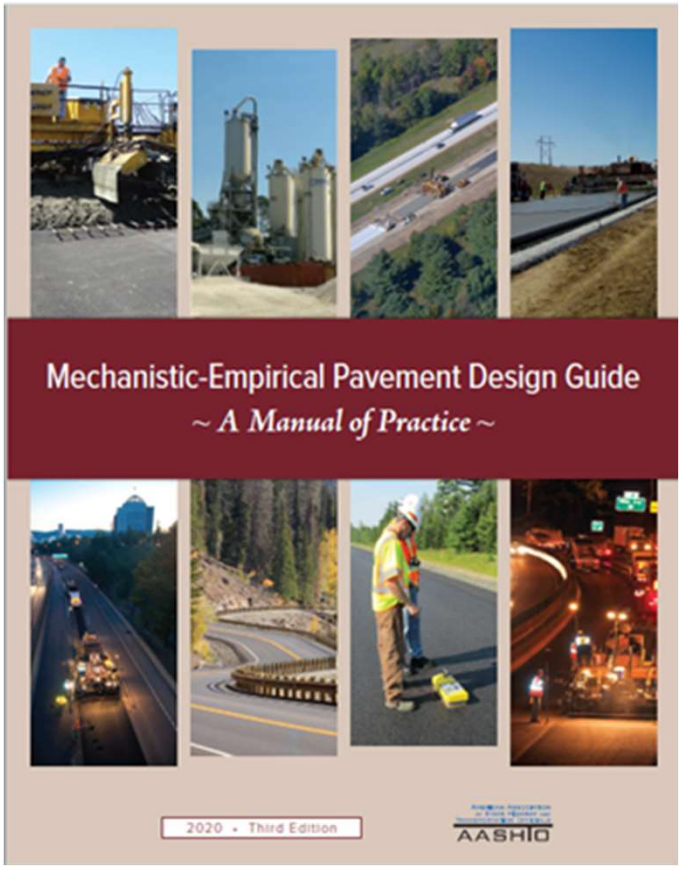
Semi-Rigid Pavements:

"*This type of pavement is also referred to as composite pavements in the MEPDG…*"



New Composite Pavements Defined

MEPDG Manual of Practice, Under Section 3.4:



JPCP Overlays:

"…*Composite pavements consist of AC placed over PCC, lean concrete, or a cement stabilized base (including roller compacted concrete). Composite pavements are the same as semi-rigid pavements (defined in subsection 3.3)…*"

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New Composite Pavements Defined

SHRP2 Reports on Composite Pavements:

1. Composite Pavement Systems, *Volume 1: HMA/PCC Composite Pavements*; Report #S2-R21-RR-2, Strategic Highway Research Program, Transportation Research Board of the National Academies, Shreenath Rao, Mike Darter, Derek Tompkins, Mary Vancura, Lev Khazanovich, Jim Signore, Erdem Colbert, Rongzong Wu, John Harvey, and Julie Vandenbossche; 2013.
2. Composite Pavement Systems, *Volume 2 PCC/PCC Composite Pavements*; Report #S2-R21-RR-3, Strategic Highway Research Program, Transportation Research Board of the National Academies, Shreenath Rao, Mike Darter, Derek Tompkins, Mary Vancura, Lev Khazanovich, Jim Signore, Erdem Colbert, Rongzong Wu, John Harvey, and Julie Vandenbossche; 2013.

Two referenced reports.

New Composite Pavements Defined

HMA/PCC Composite Pavements, extracted from the SHRP Research Report:

- *"Relatively thin HMA layers over a newly placed, but sufficiently hardened, PCC layer. …HMA is used to indicate all types of asphalt-based products, including stone matrix asphalt (SMA), dense and porous HMA (including polymer-modified asphalt [PMA]), asphalt rubber friction course (ARFC), and others. The wearing surface is a relatively thin, high-quality type of HMA that could consist of one or more layers of HMA with or without special layers or materials to retard reflection cracks. The PCC layer can consist of JPC or CRC. The PCC materials of this layer can consist of conventional PCC, roller compacted concrete, or a lower cost PCC (such as with a softer large-aggregate or recycled PCC material, or what has previously been called lean concrete base [LCB])."*

New Composite Pavements Defined

PCC/PCC Composite Pavements, extracted from the SHRP Research Report:

- *"Relatively thin, high-quality concrete surface placed immediately on top of a plastic concrete layer. The lower concrete layer may include increased amounts of recycled materials, including RCA, RAP, and others; increased use of local and less expensive aggregates; and higher substitution rates for cementitious materials (fly ash or other supplementary cementitious materials [SCMs]) that may be less suitable for use in a surface layer at the higher substitution amounts."*

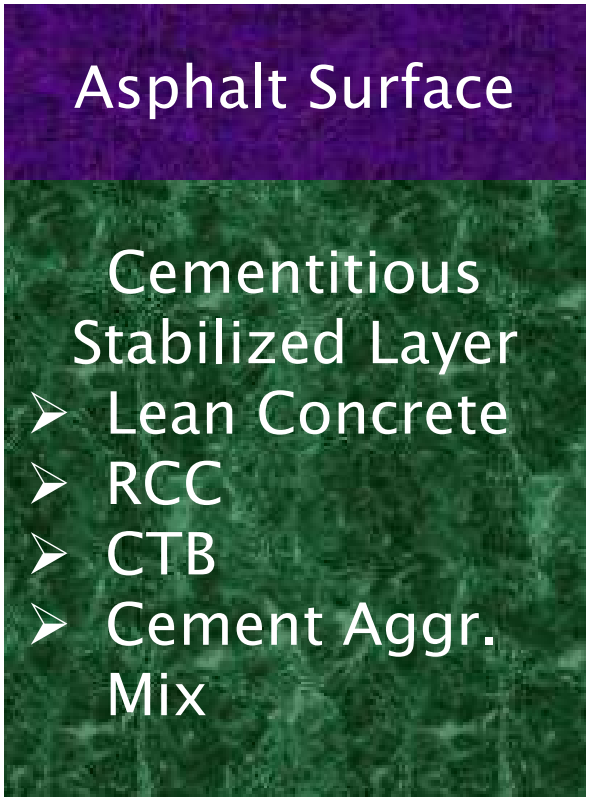
New Composite Pavements Defined

MEPDG MOP	SHRP2 Volume 1	SHRP2 Volume 2
Semi-Rigid Pavement	AC over PCC	PCC over PCC
AC placed over new cementitious stabilized materials:	AC placed over new JPC or CRC	JPC or CRC, high quality surface placed over:
➢ Lean concrete ➢ RCC ➢ CTB or cement aggregate mixtures ➢ Lime-fly ash ➢ Lime	➢ Conventional PCC AC placed new PCC: ➢ Lean Concrete ➢ RCC	➢ Lower cost PCC base layer

- Modulus of rupture is less than 400 psi at 28-days.
- Fatigue cracking calibration coefficients – different than for conventional PCC mixes.

New Composite Pavements Defined

Semi-Rigid Pavement



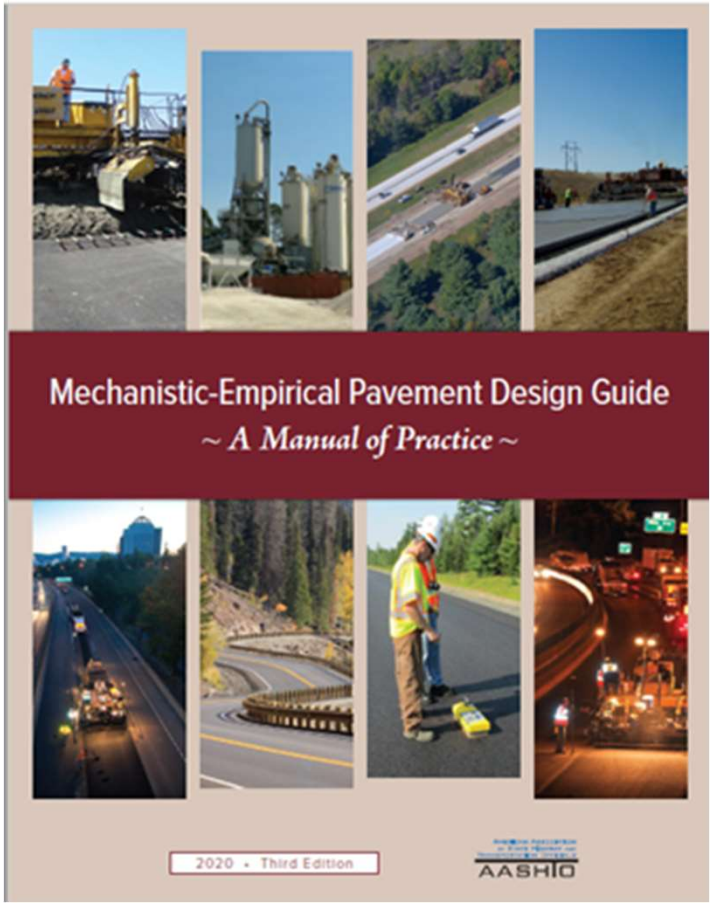
Composite Pavement

Semi-Rigid pavements are NOT the same as new composite pavements with an asphalt surface.

New Composite Pavements Defined

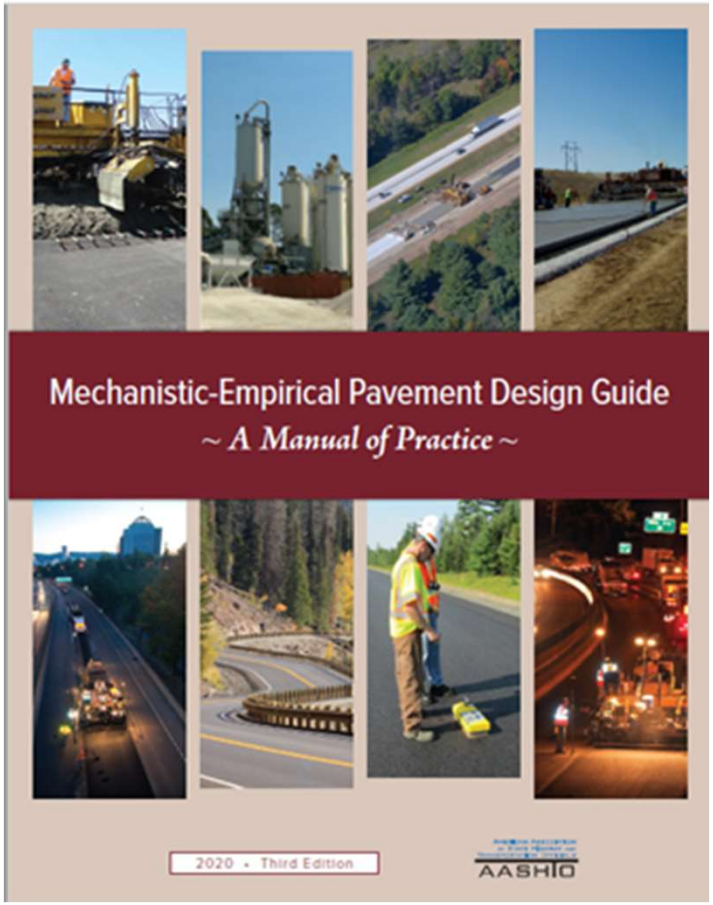
1. New asphalt layers placed on new or recently placed PCC base layer.
2. New PCC surface placed on new PCC base layer.

There is NO design strategy in the Pavement ME software to directly consider and design new AC layers over new JPC or CRC or higher quality PCC mixes placed over new JPC or CRC layers.



New Composite Pavements Defined

1. 1st Edition of the MEPDG MOP (2008) was published prior to the SHRP2 research.
2. 2nd (2015) and 3rd (2020) editions regarding composite pavements were not revised.



Adding a new design strategy for new composite pavements is on AASHTOWare's list of future enhancements.

FY 2022 – Webinar #3: Composite Pavement Design

Webinar Outline:

1. New Composite Pavements Defined
2. Designing New Composite Pavements
3. Assumptions and Inputs
4. Summary and Takeaway Comments
5. Question and Answer Session

Designing New Composite Pavements

Suggested Decision Tree (table) based on the MEPDG MOP and the SHRP2 research reports.

Surface Type	Base Strength	Type	Design Strategy	Check
Asphalt	Cementitious Stabilized; MOR < 400 psi, 28-days	Plain	New semi-rigid pavement in accordance with MEPDG MOP	
	Cementitious Stabilized; MOR > 400 psi, 28-days	JPC	Asphalt overlay of JPCP	New JPCP
		CRC	Asphalt overlay of CRCP	New CRCP
PCC	Cementitious Stabilized; MOR < 400 psi, 28-days	JPC, CRC	New JPCP or new CRCP	
	Cementitious Stabilized; MOR > 400 psi, 28-days	JPC	Bonded PCC overlay of JPCP	New JPCP
		CRC	Bonded PCC overlay of CRCP	New CRCP

Designing New Composite Pavements

Calibration of Design Strategies, v2.6:

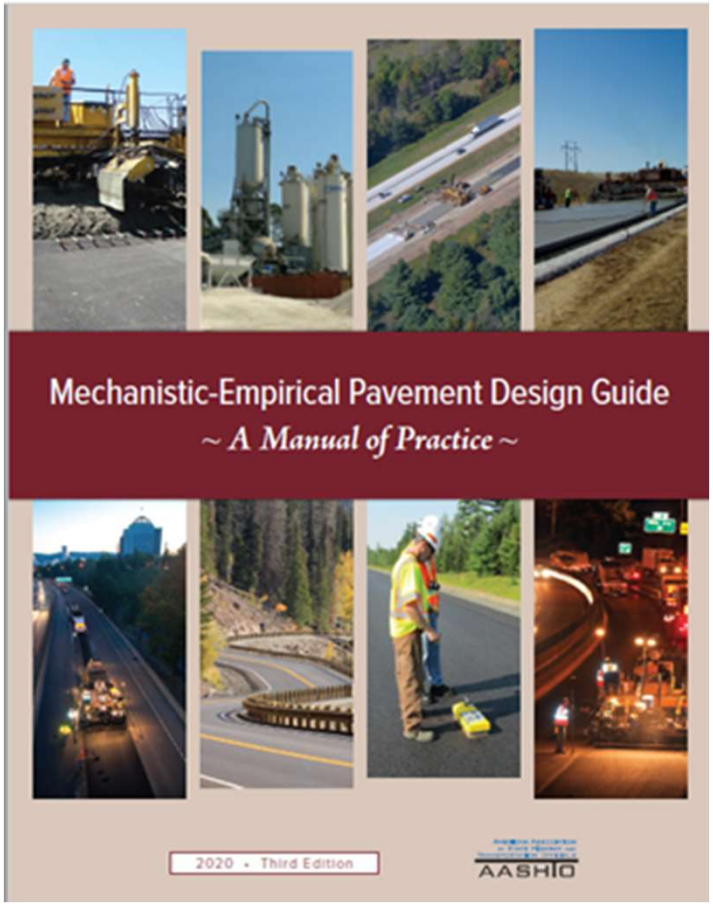
- Semi-Rigid Pavements — Calibrated for asphalt over cementitious stabilized bases.
- AC/JPC — Calibrated for asphalt overlays of JPCP.
- AC/CRC — Minimal sections included in calibration of asphalt overlays of CRCP.
- PCC/JPC — Not calibrated for v2.6.
- PCC/CRC — Not calibrated for v2.6

As designers/engineers, we make assumptions in using design procedures beyond for which they were developed.

Designing New Composite Pavements

MEPDG Manual of Practice, 3rd Edition, 2020:

1. Design Strategy: New Semi-Rigid Pavement.
2. Design Criteria
   a) AC rut depth
   b) AC total transverse cracks (new plus reflective)
   c) AC top-down fatigue cracks
   d) Chemically stabilized layer fatigue cracks
   e) Total bottom-up fatigue cracks (new plus reflective)
   f) Terminal IRI



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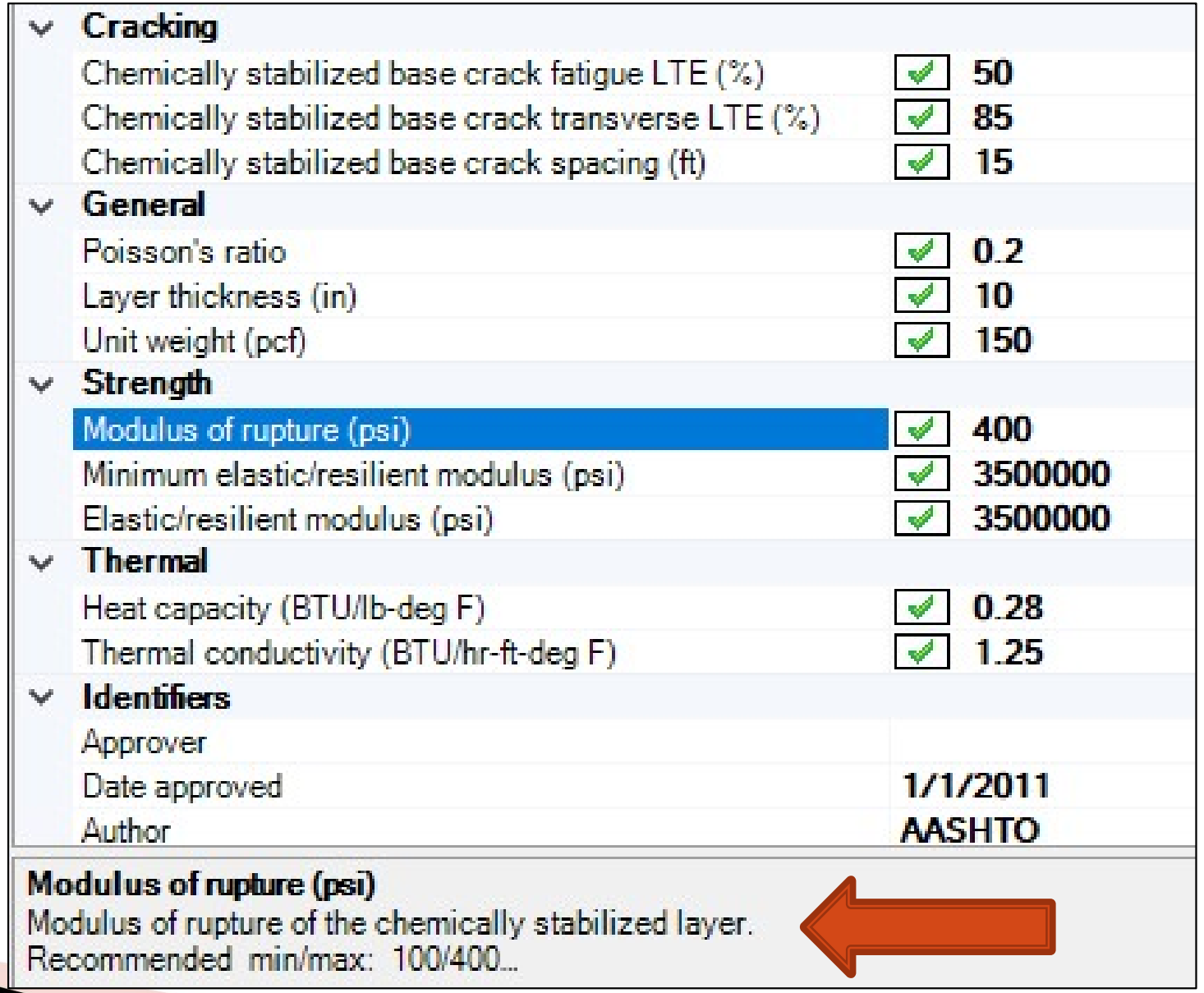
Designing New Composite Pavements

MEPDG Manual of Practice using new *Semi-Rigid Pavement*.

- *Limit on MOR.*
- *Cannot use for CRC.*



Designing New Composite Pavements

HMA/PCC Composite Pavements, SHRP2 Research Report Suggestions:

1. Design Strategy: AC Overlay
   a) AC/JPCP for AC over JPC and AC over RCC/lean PCC base
   b) AC/CRCP for AC over CRC
2. Design Criteria
   a) AC/JPCP
      i. Rut Depth
      ii. PCC transverse or cracked slabs
      iii. IRI
   b) AC/CRCP
      i. Rut Depth
      ii. Punchouts
      iii. IRI

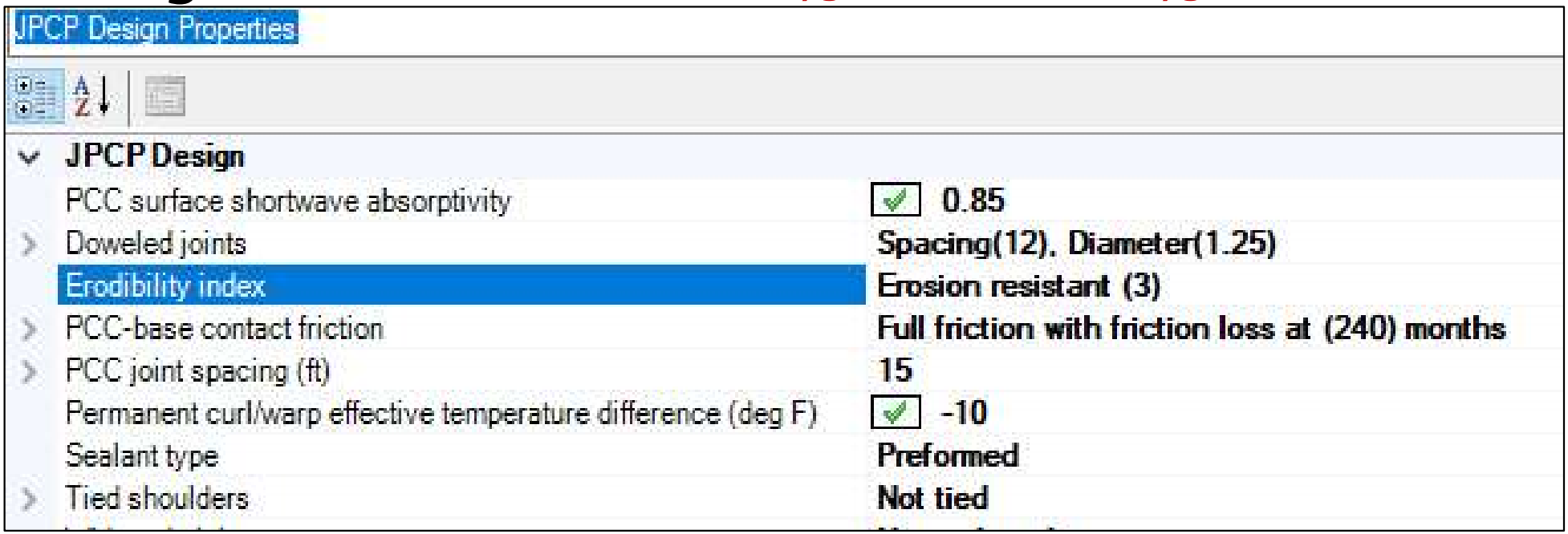
Designing New Composite Pavements

PCC/PCC Composite Pavements, SHRP2 Research Report Suggestions:

1. Design Strategy: Bonded PCC Overlay
   a) Bonded PCC/JPCP
   b) Bonded PCC/CRCP
2. Design Criteria
   a) Bonded PCC/JPCP
      i. PCC transverse or cracked slabs
      ii. IRI
   b) Bonded PCC/CRCP
      i. Punchouts
      ii. IRI

Designing New Composite Pavements

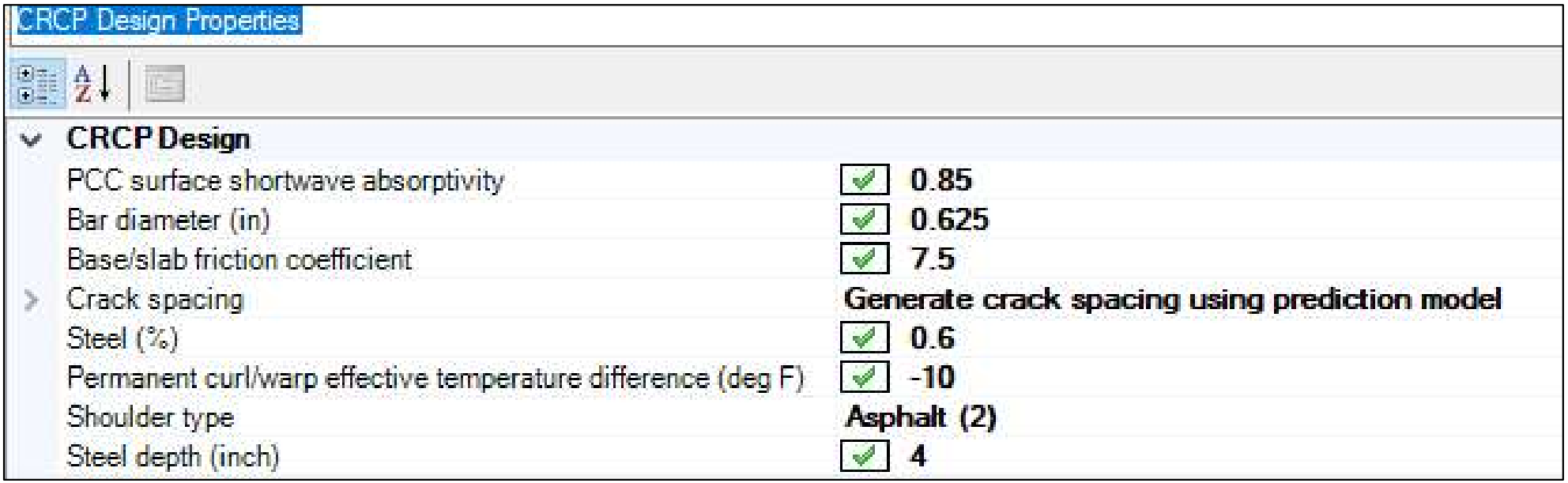
SHRP2 Research Report using the Pavement ME Design software for *HMA/JPC or PCC/JPC*:



PCC mix/layer properties are the same as for new JPCP.

Designing New Composite Pavements

SHRP2 Research Report using the Pavement ME Design software for *HMA/CRC or PCC/CRC*:



PCC mix/layer properties are the same as for new CRCP.

Designing New Composite Pavements

Design Criteria for each Strategy

New Semi-Rigid Pavement

Performance Criteria	Limit	Reliability
Initial IRI (in/mile)	63	
Terminal IRI (in/mile)	172	90
AC top-down fatigue cracking (% lane area)	25	90
AC bottom-up fatigue cracking (% lane area)	25	50
AC thermal cracking (ft/mile)	1000	50
Chemically stabilized layer - fatigue fracture (% lane area)	25	50
Permanent deformation - total pavement (in)	0.75	90
Permanent deformation - AC only (in)	0.25	90
AC total fatigue cracking: bottom up + reflective (% lane area)	25	90
AC total transverse cracking: thermal + reflective (ft/mile)	2500	90

AC Overlay of JPCP

Performance Criteria	Limit	Reliability
Initial IRI (in/mile)	63	
Terminal IRI (in/mile)	172	90
AC top-down fatigue cracking (% lane area)	25	90
AC bottom-up fatigue cracking (% lane area)	25	90
AC thermal cracking (ft/mile)	1000	50
Permanent deformation - AC only (in)	0.25	90
AC total transverse cracking: thermal + reflective (ft/mile)	2500	90
JPCP transverse cracking (percent slabs)	15	90

AC Overlay of CRCP

Performance Criteria	Limit	Reliability
Initial IRI (in/mile)	63	
Terminal IRI (in/mile)	172	90
AC top-down fatigue cracking (% lane area)	25	90
AC bottom-up fatigue cracking (% lane area)	25	90
AC thermal cracking (ft/mile)	1000	50
Permanent deformation - AC only (in)	0.25	90
AC total transverse cracking: thermal + reflective (ft/mile)	2500	90
CRCP punchouts (1/mile)	10	90

Designing New Composite Pavements

Criteria	MEPDG MOP New Semi-Rigid	SHRP2 AC/JPC	SHRP2 AC/CRC
Terminal IRI	Yes	Yes	Yes
AC Rut Depth	Yes	Yes	Yes
AC Total Transverse Cracking	Yes	Yes	No; Calibration?
AC Top-Down Fatigue Cracking	Yes	Yes	Yes
Bottom-Up Fatigue Cracking	Yes	Yes	Yes
Fatigue Chemically Stabilized Layer	Yes	NA	NA
Mid-Slab Cracking, JPC	No	Yes	NA
Faulting, JPC	No	No	NA
Punchouts, CRC	No	NA	Yes

Designing New Composite Pavements

What about faulting in the *HMA/JPC* composite pavement design strategy?

- Check faulting for HMA/JPC by running a new JPCP with the same layer properties; remove the asphalt wearing surface.

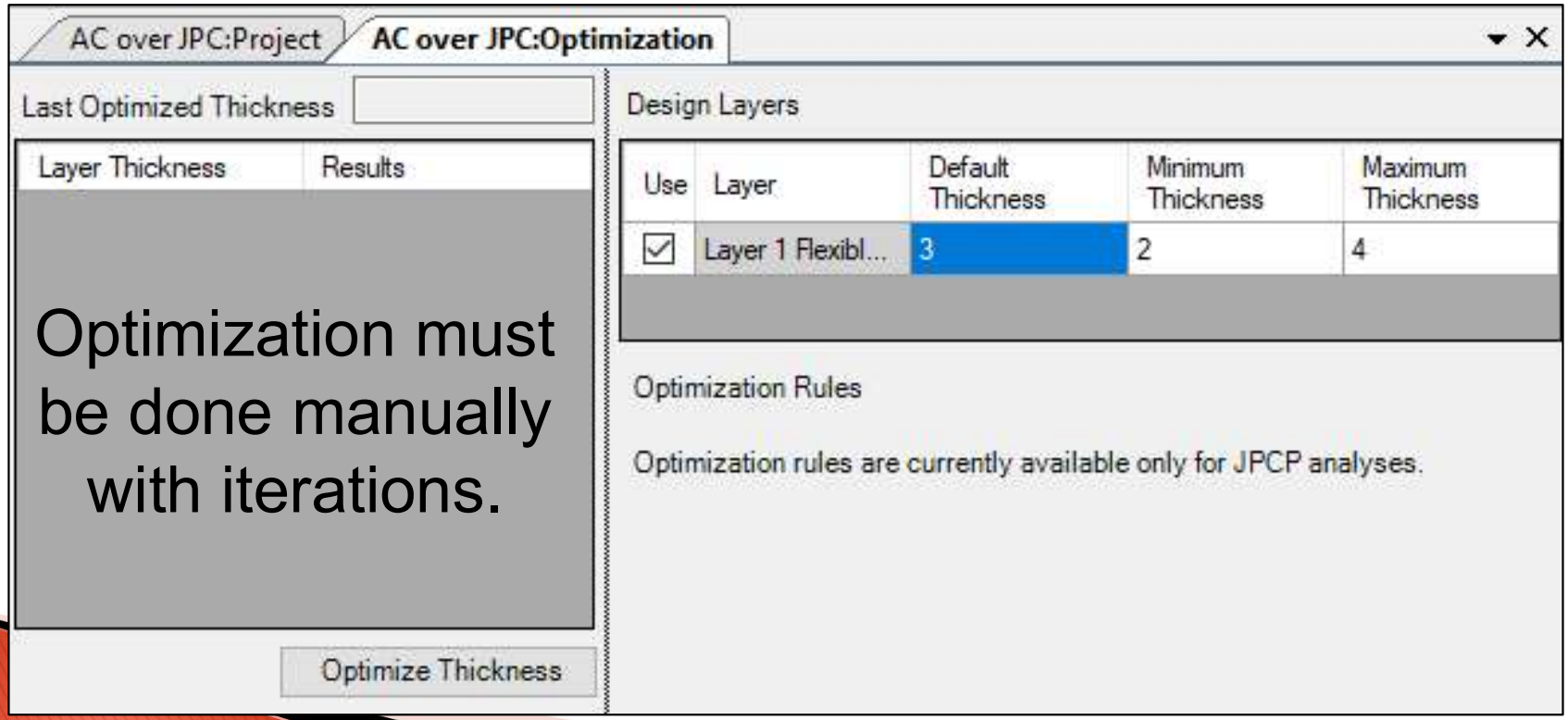
Reinforcing steel is placed in the lower low-cost PCC layer and not in the thin higher quality PCC surface of the *PCC/CRC* composite pavement.

- Complete PCC/CRC design by running a new CRCP with the reinforcing steel at the design depth.

Designing New Composite Pavements

Optimization Feature for AC Overlay of JPC or CRC:

- Optimization feature is only applicable to the asphalt overlay thickness.



FY 2022 – Webinar #3: Composite Pavement Design

Webinar Outline:

1. New Composite Pavements Defined
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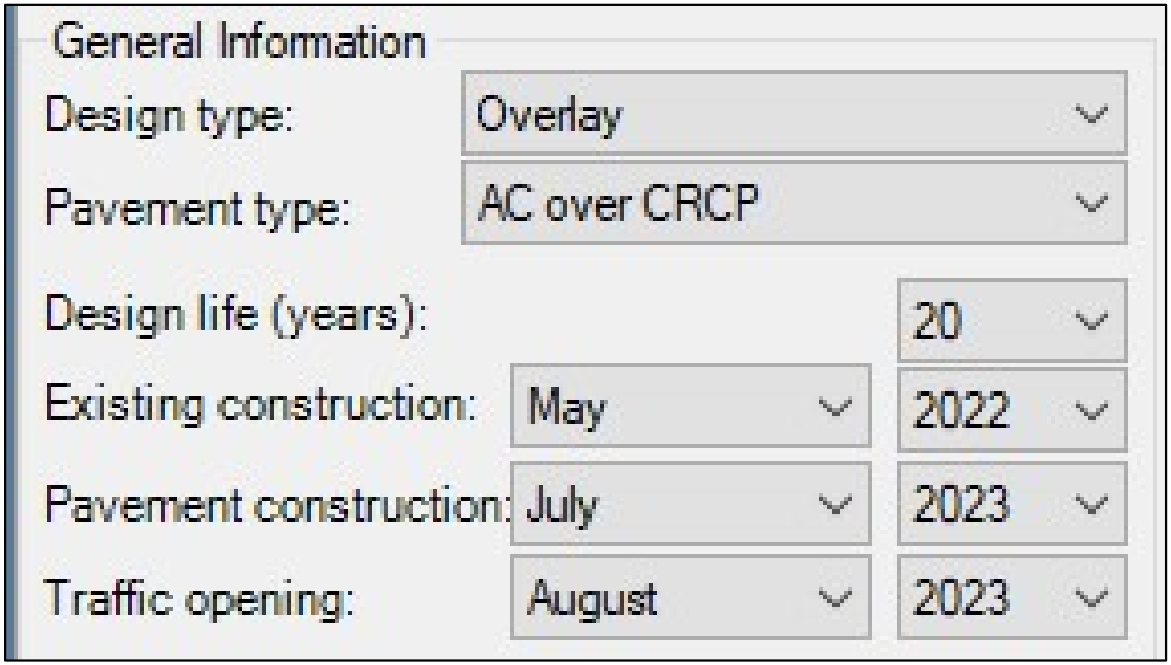
Assumptions and Inputs

Construction Dates:

The Pavement ME Design software requires at least 1-year between the PCC layer construction and asphalt layer placement.



Assumption:

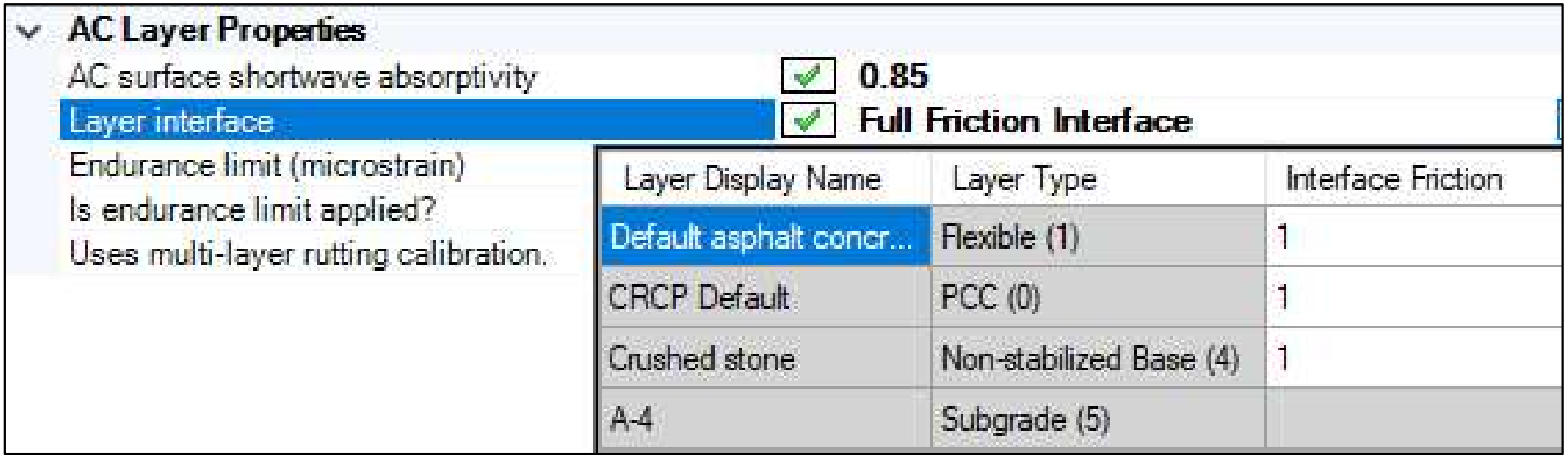
- The year+ offset has an insignificant impact on the predicted distresses.

Assumptions and Inputs

Bond between AC and PCC layers:

Assumption:

- The AC layers will remain bonded to the underlying PCC layer throughout the design period.



Designer/engineer needs to decide if this assumption is appropriate?

Assumptions and Inputs

Layer Properties:

Assumption:

- All AC, PCC, unbound aggregate base, and subgrade soil layer properties are the same as for new flexible and rigid pavement designs.

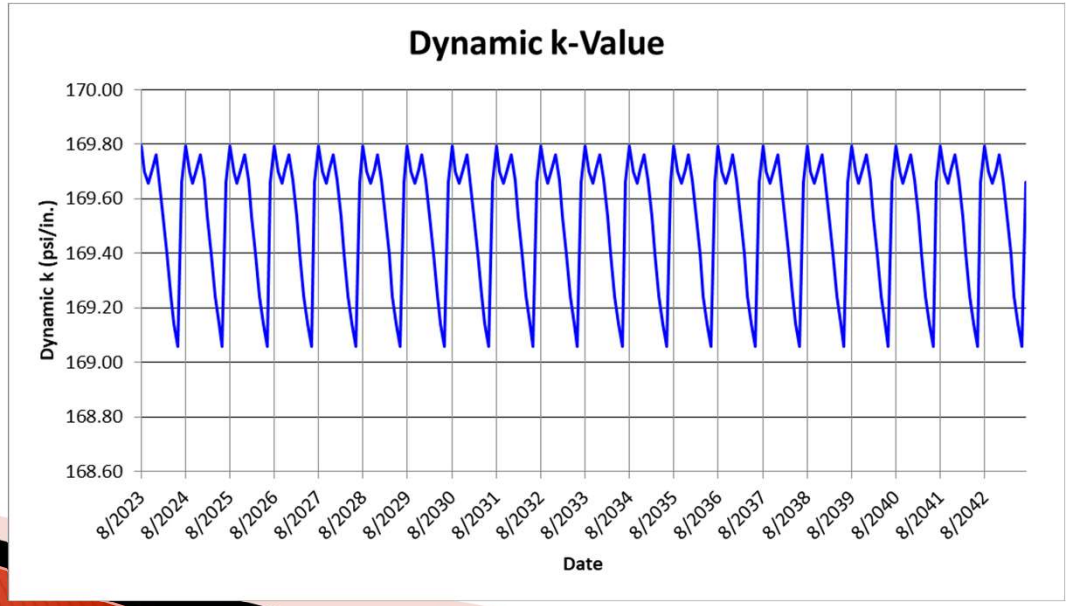
Assumptions and Inputs

CRCP Rehabilitation:

- 0 punchouts per mile at the beginning of the design period.

CRCP Foundation Support:

- Modulus of Subgrade reaction is calculated.



Assumptions and Inputs

JPCP Rehabilitation:

- 0 slabs distressed/replaced before restoration.
- 0 slabs replaced after restoration.

JPCP Foundation Support:

- Modulus of Subgrade reaction is calculated.

Assumptions and Inputs

Calibration Coefficients

Assumption:

- The AC and PCC calibration coefficients derived for new flexible and rigid pavements, as well as for AC overlays of PCC pavements are applicable to the new composite pavement design strategy.

Designer/engineer needs to decide if this assumption appropriate?

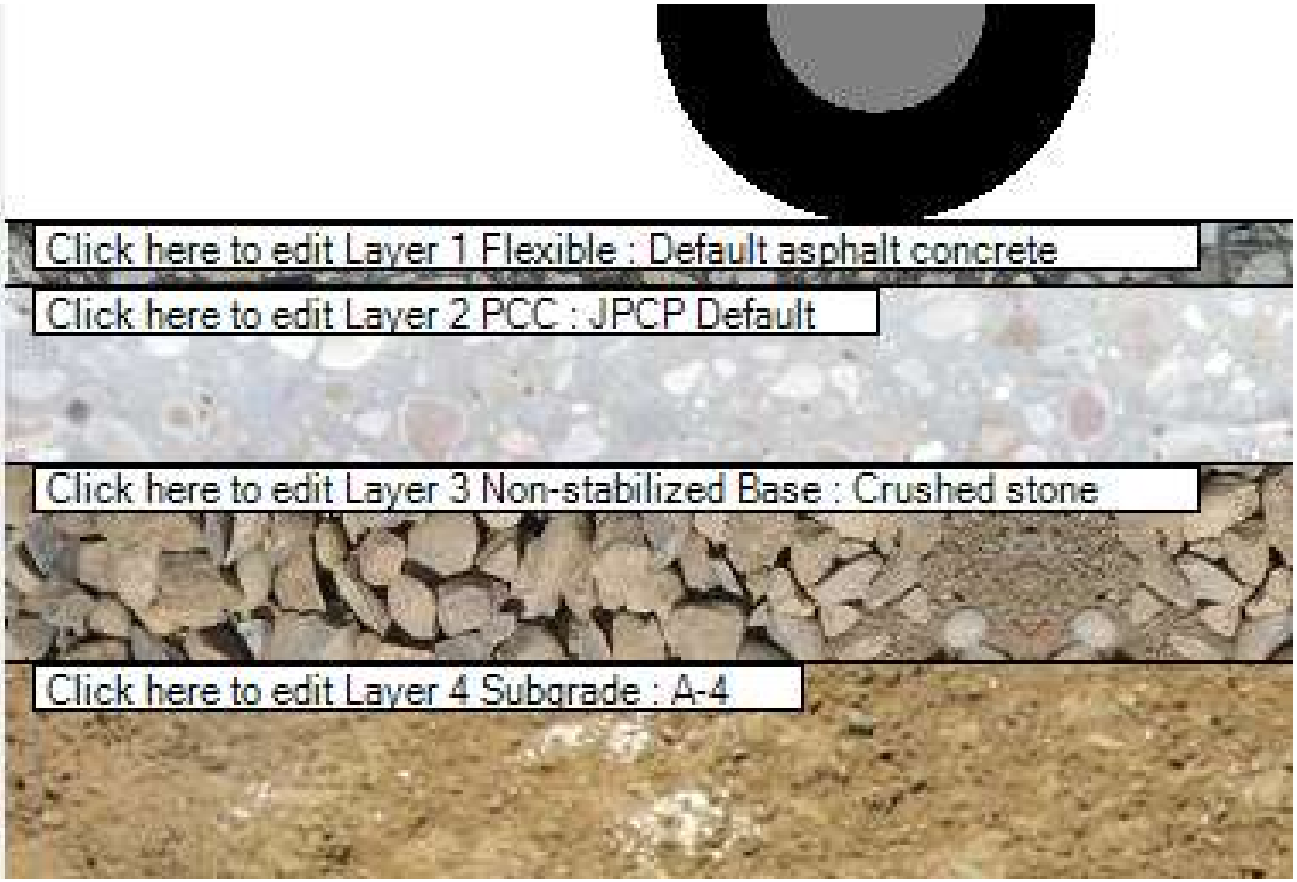
Example Results/Outcomes

Some examples for new composite pavement design.

Example Results/Outcomes

Composite Pavement, *AC over JPC*:

- Agency has placed lots of JPCP with an AC surface for noise control.
- Total trucks; 16,000,000.
- Climate is in the southwest.



3 inches asphalt wearing surface.
8 inches JPC base.
9 inches crushed stone base.

Example Results/Outcomes

Composite Pavement, *AC over JPC*:

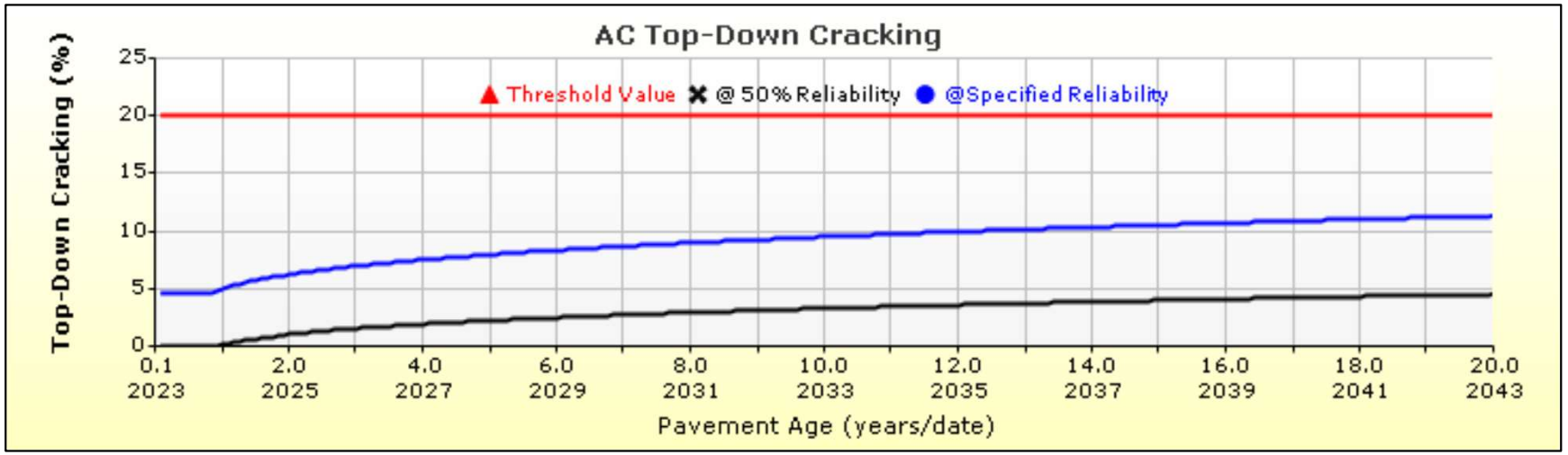
Distress Prediction Summary

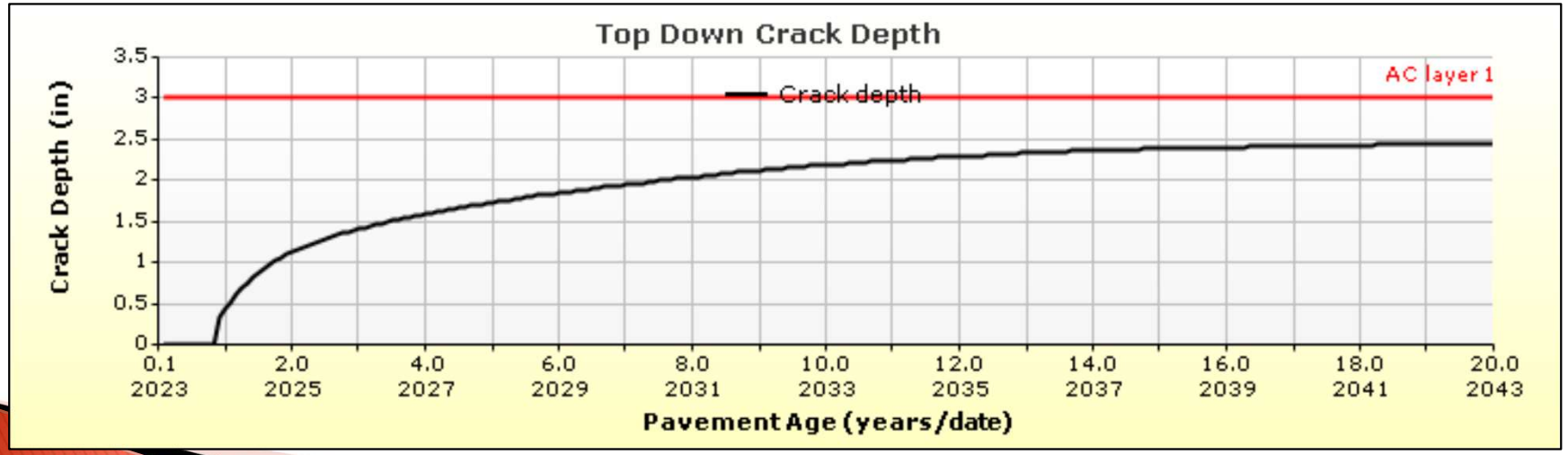
Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	112.30	90.00	99.90	Pass
Permanent deformation - AC only (in)	0.40	0.19	90.00	100.00	Pass
AC bottom-up fatigue cracking (% lane area)	15.00	1.45	90.00	100.00	Pass
AC thermal cracking (ft/mile)	1500.00	1478.40	50.00	100.00	Pass
AC top-down fatigue cracking (% lane area)	20.00	11.31	90.00	99.82	Pass
JPCP transverse cracking (percent slabs)	15.00	0.96	90.00	100.00	Pass

NOTE: Total transverse cracks (new and reflective) will exceed the typical threshold value typically used of 1,500 feet per mile.

Example Results/Outcomes

Composite Pavement, *AC over JPC*:





Example Results/Outcomes

Composite Pavement, *AC over JPC* – a check:

Compare to new JPCP design strategy to ensure faulting is lower than the threshold value.

Distress Prediction Summary

Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	109.92	90.00	99.85	Pass
Mean joint faulting (in)	0.12	0.06	90.00	99.97	Pass
JPCP transverse cracking (percent slabs)	15.00	7.56	90.00	99.78	Pass

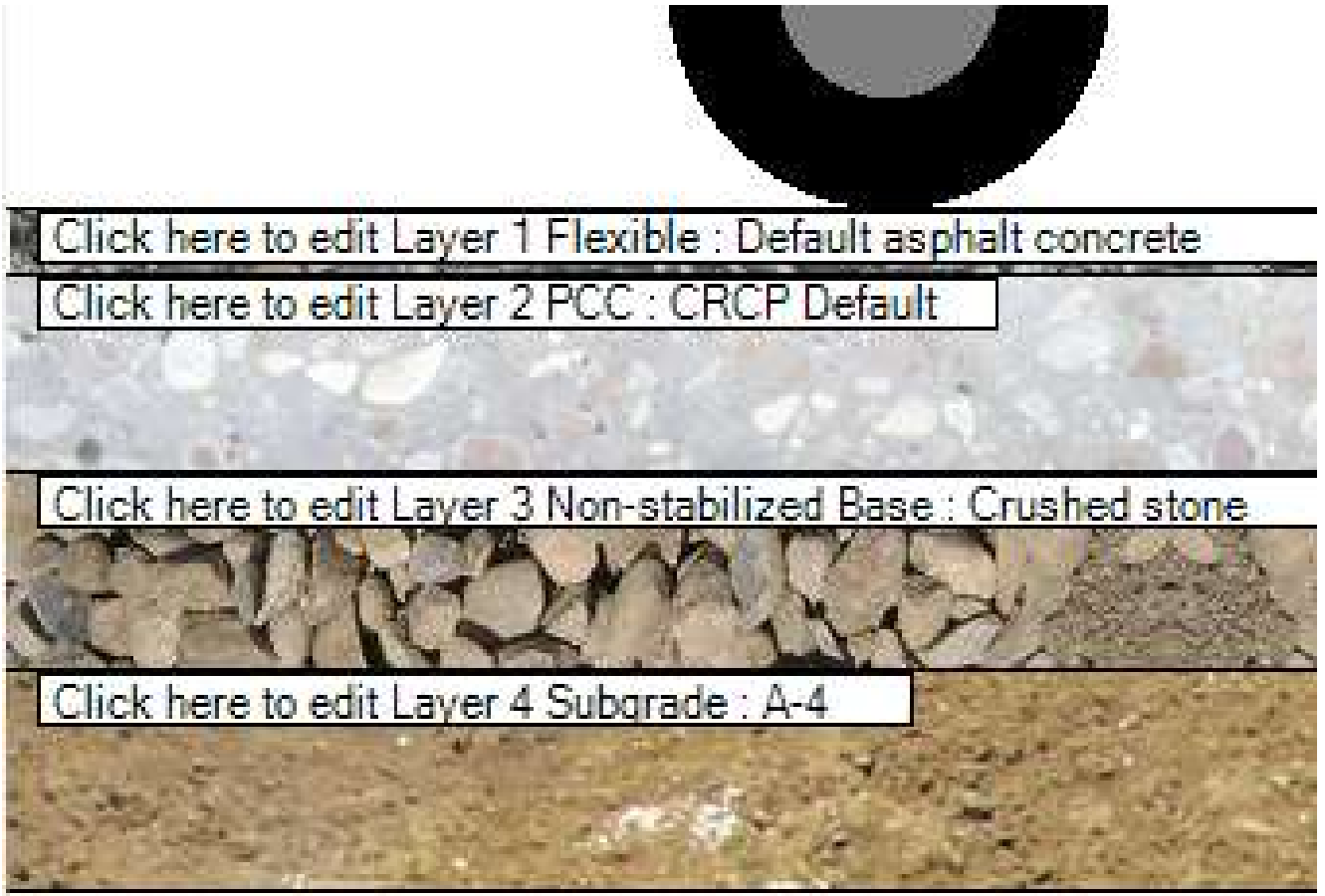
Designer makes a decision on the layer thicknesses.

Layer Identification	AC/JPC	New JPCP
Asphalt Layer	3.0	NA
JPC	8.0	8.5
Crushed Stone	9.0	9.0

Example Results/Outcomes

Composite Pavement, *AC over CRC*:

- Agency has placed some CRCP with an AC surface for noise control.
- Total trucks; 16,000,000.
- Climate is in the southwest.



3 inches asphalt wearing surface.
8 inches CRC base.
9 inches crushed stone base.

Example Results/Outcomes

Composite Pavement, *AC over CRC*:

Distress Prediction Summary

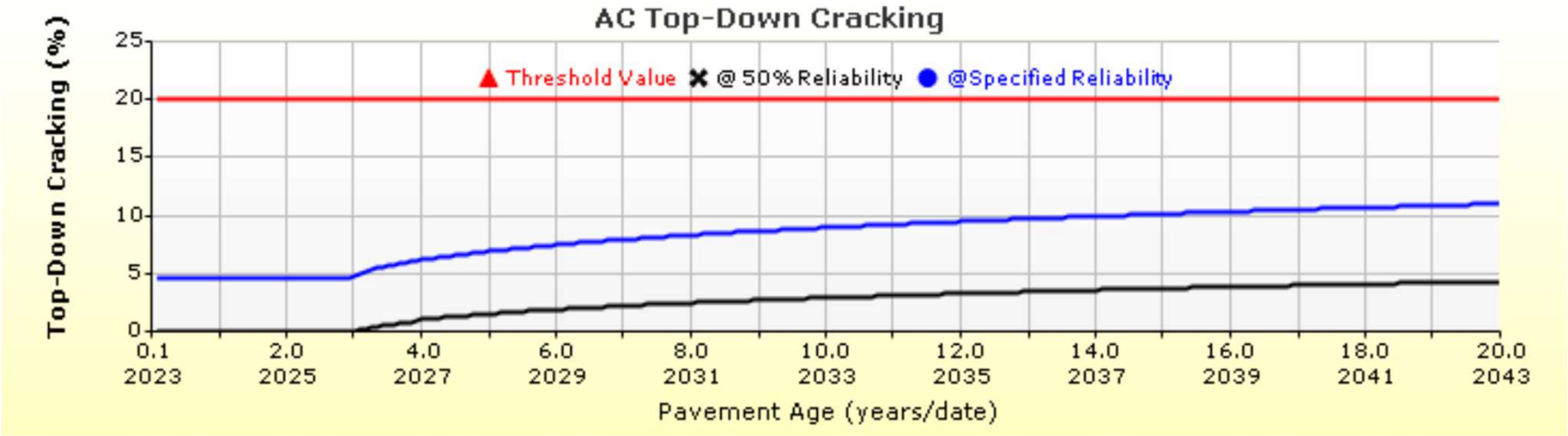
Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	115.11	90.00	99.83	Pass
Permanent deformation - AC only (in)	0.40	0.19	90.00	100.00	Pass
AC bottom-up fatigue cracking (% lane area)	15.00	1.45	90.00	100.00	Pass
AC top-down fatigue cracking (% lane area)	20.00	11.31	90.00	99.82	Pass
CRCP punchouts (1/mile)	30.00	18.50	90.00	99.80	Pass

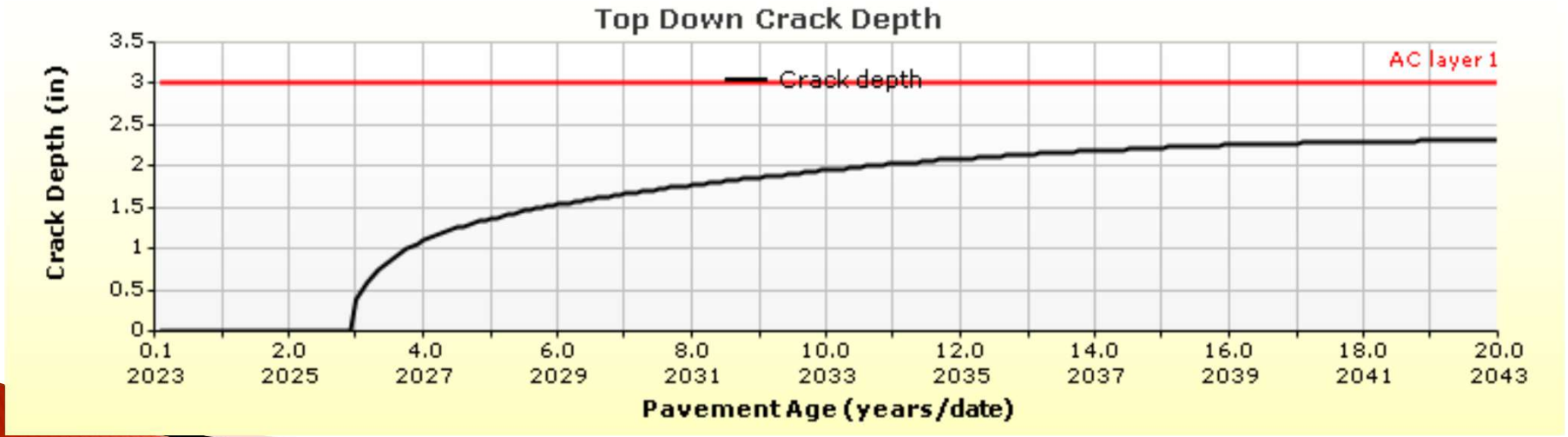
NOTE: Total transverse cracks (new and reflective) will exceed the typical threshold value typically used of 1,500 feet per mile.

NOTE: Insufficient number of asphalt overlay of CRCP sections to calibrate the total transverse cracking predictions.

Example Results/Outcomes

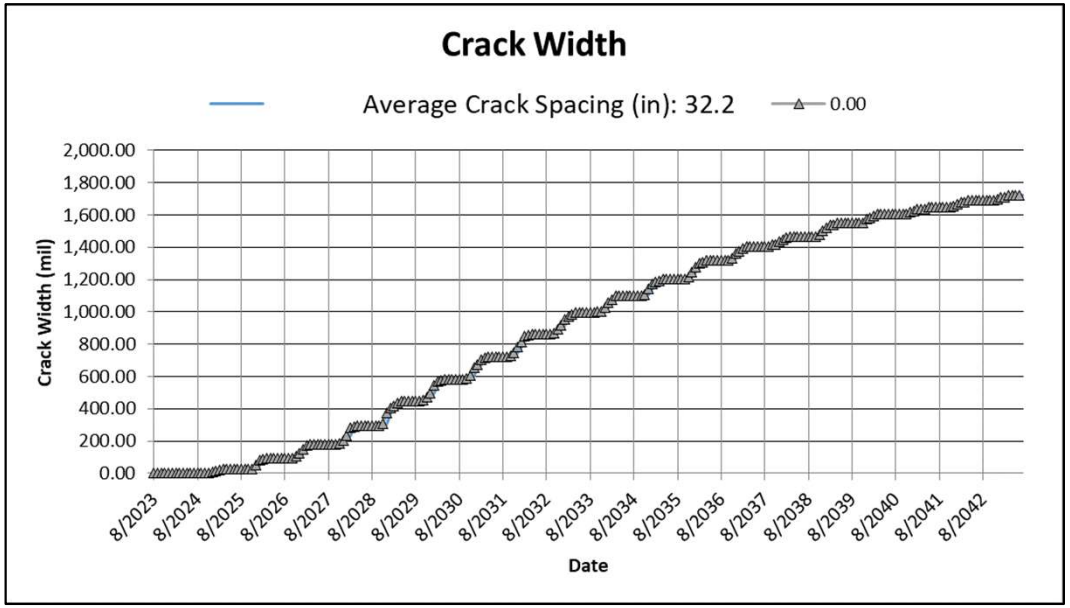
Composite Pavement, *AC over CRC*:

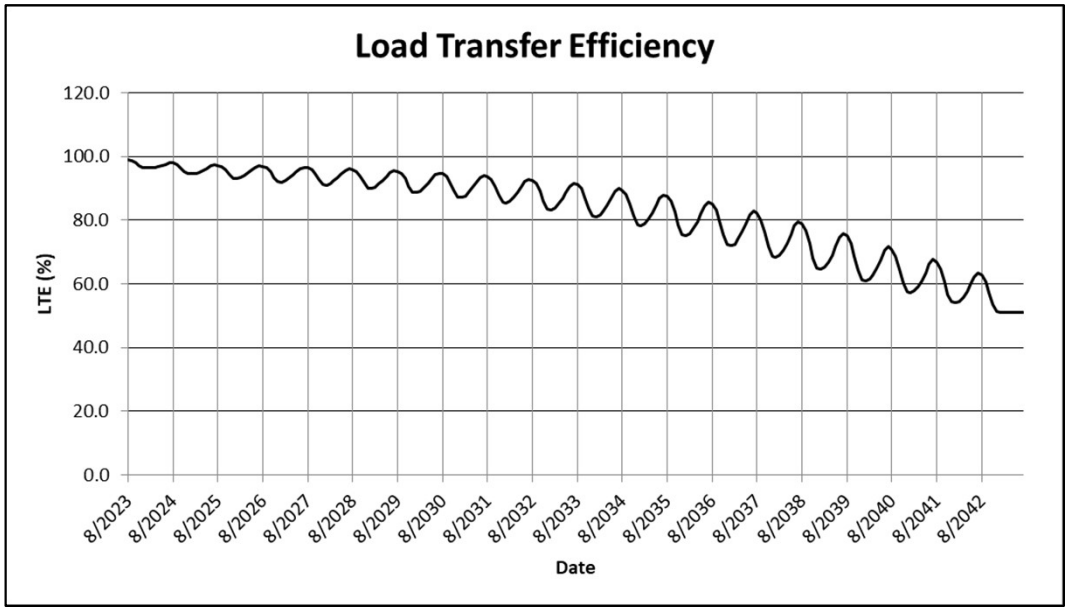




Example Results/Outcomes

Composite Pavement, *AC over CRC*:





Example Results/Outcomes

Composite Pavement, *AC over CRC* – a check:

Compare to new CRCP design strategy for all distresses to be lower than the threshold values.

Distress Prediction Summary

Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	93.54	90.00	100.00	Pass
CRCP punchouts (1/mile)	30.00	11.16	90.00	100.00	Pass

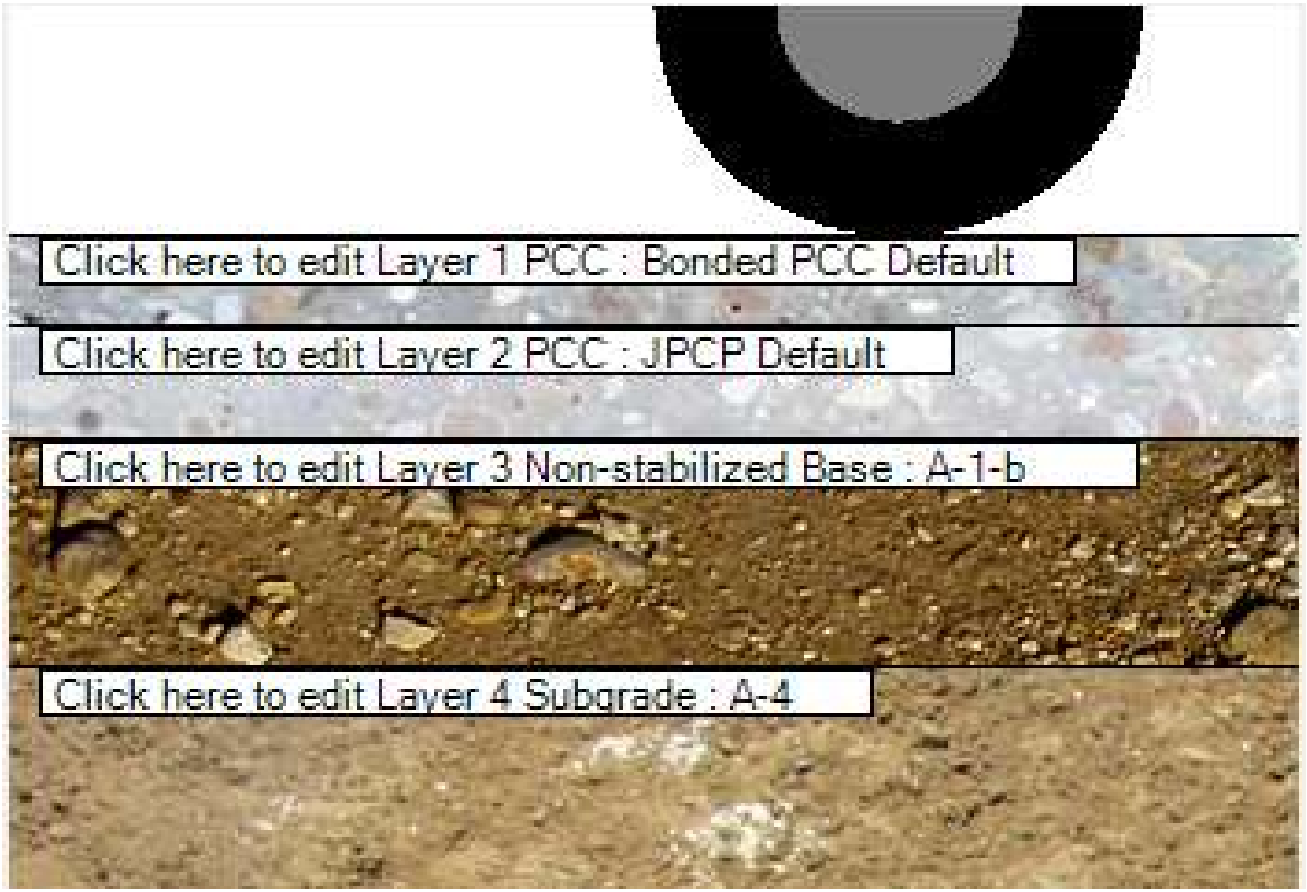
Designer makes a decision on the layer thicknesses.

Layer Identification	AC/CRC	New CRCP
Asphalt Layer	3.0	NA
CRC	8.0	9.0
Crushed Stone	9.0	9.0

Example Results/Outcomes

Composite Pavement, *Bonded PCC over JPC*:

- Agency has little experience with two lift PCC.
- Total trucks; 16,000,000.
- Climate is in the southwest.



4 inches high quality PCC mix.
5 inches JPC base, lower cost PCC.
9 inches crushed stone base.

Example Results/Outcomes

Composite Pavement, *Bonded PCC over JPC*:

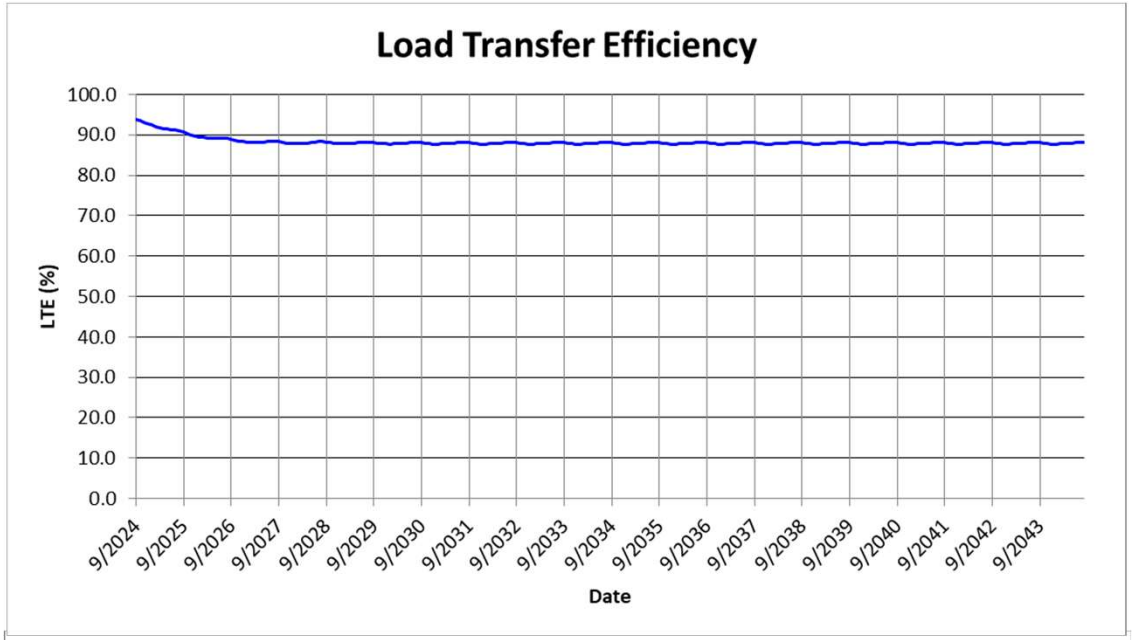
Distress Prediction Summary

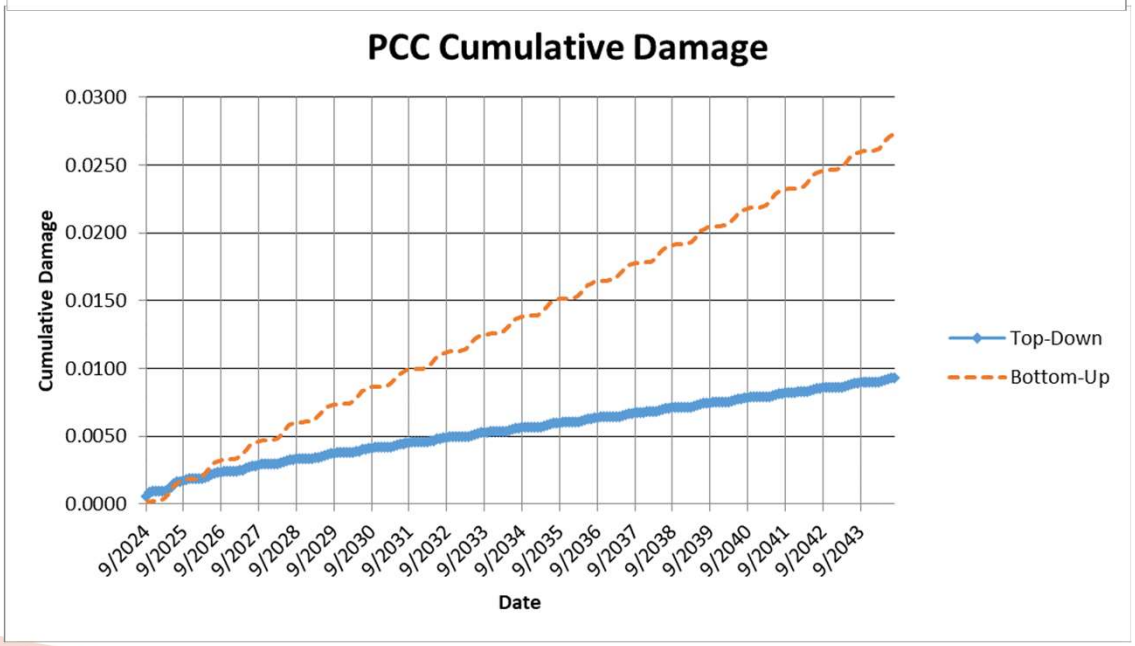
Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	107.16	90.00	99.92	Pass
Mean joint faulting (in)	0.12	0.06	90.00	99.99	Pass
JPCP transverse cracking (percent slabs)	15.00	7.31	90.00	99.83	Pass

NOTE: High quality PCC surface mix placed on a newly placed JPC conventional or lower cost PCC mix was not included in any of the global calibrations.

Example Results/Outcomes

Composite Pavement, *Bonded PCC over JPC*:





Example Results/Outcomes

Composite Pavement, *Bonded PCC over JPC* – a check.

Compare to new JPCP design strategy for all distresses to be lower than the threshold values.

Distress Prediction Summary

Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	105.47	90.00	99.93	Pass
Mean joint faulting (in)	0.12	0.06	90.00	99.96	Pass
JPCP transverse cracking (percent slabs)	15.00	9.52	90.00	98.84	Pass

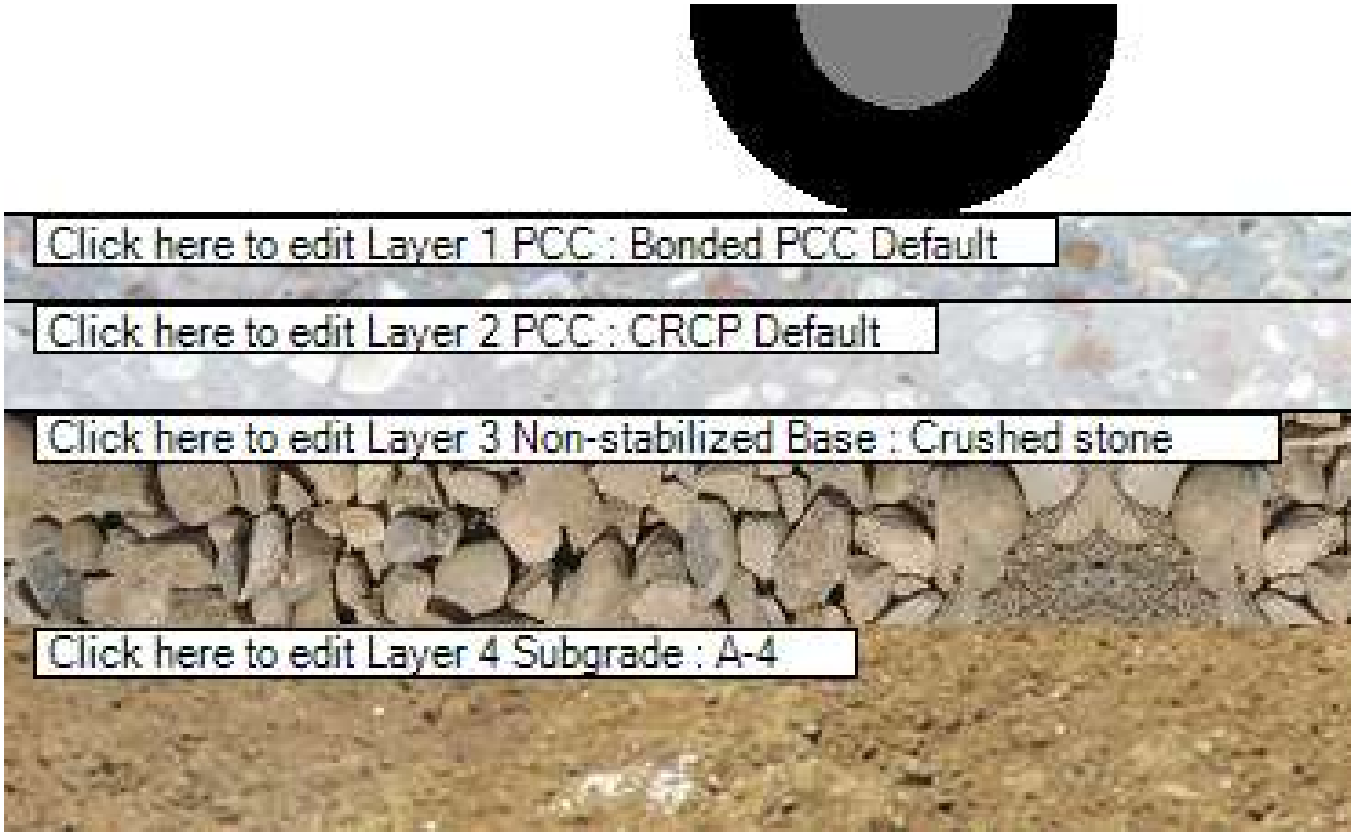
Designer makes a decision on the layer thicknesses.

Layer Identification	PCC/JPC	New JPCP
Higher Quality Surface	4.0	NA
JPC, Lower Quality PCC	4.5	9.0
Crushed Stone	9.0	9.0

Example Results/Outcomes

Composite Pavement, *Bonded PCC over CRC*:

- Agency has little experience with two lift PCC.
- Total trucks; 16,000,000.
- Climate is in the southwest.



4 inches high quality PCC mix.
5 inches CRC base, lower cost PCC.
9 inches crushed stone base.

AASHTOWare Pavement ME Design

Example Results/Outcomes

Composite Pavement, *Bonded PCC over CRC*:

Distress Prediction Summary

Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	92.08	90.00	100.00	Pass
CRCP punchouts (1/mile)	30.00	10.35	90.00	100.00	Pass

NOTE: Reinforcing steel is placed in the lower low-cost PCC layer and NOT in the thin higher quality PCC surface of the PCC/CRC composite pavement.

NOTE: High quality PCC surface mix placed on a newly placed CRC conventional or lower cost PCC mix was not included in any of the global calibrations.

Example Results/Outcomes

Composite Pavement, *Bonded PCC over CRC* – a check. Compare to new CRCP design strategy for all distresses to be lower than the threshold values.

Distress Prediction Summary

Distress Type	Distress @ Specified Reliability		Reliability (%)		Criterion Satisfied?
	Target	Predicted	Target	Achieved	
Terminal IRI (in/mile)	155.00	98.69	90.00	99.98	Pass
CRCP punchouts (1/mile)	30.00	13.94	90.00	100.00	Pass

Designer makes a decision on the layer thicknesses.

Layer Identification	PCC/CRC	New CRCP
Higher Quality Surface	4.0	NA
CRC, Lower Quality PCC	5.0	10.5
Crushed Stone	9.0	9.0

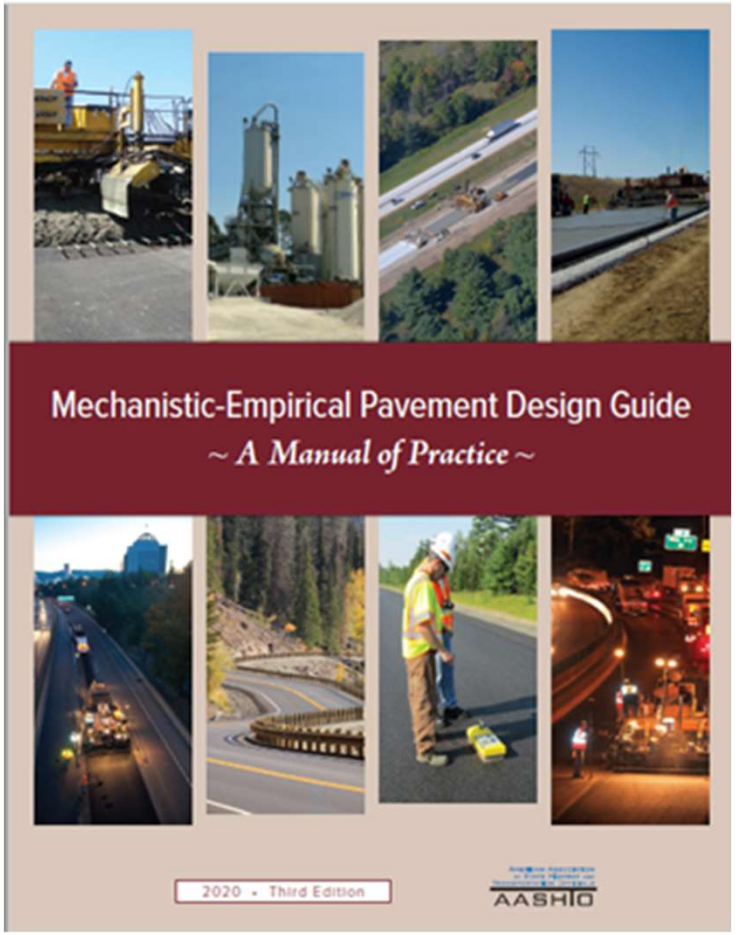
FY 2022 – Webinar #3: Composite Pavement Design

Webinar Outline:

1. New Composite Pavements Defined
2. Designing New Composite Pavements
3. Assumptions and Inputs
4. Summary and Takeaway Comments
5. Question and Answer Session

Summary and Takeaways

- Engineering judgment is needed, especially in separating new semi-rigid pavements from new composite pavements.
- Semi-rigid pavements are different from new composite pavements.



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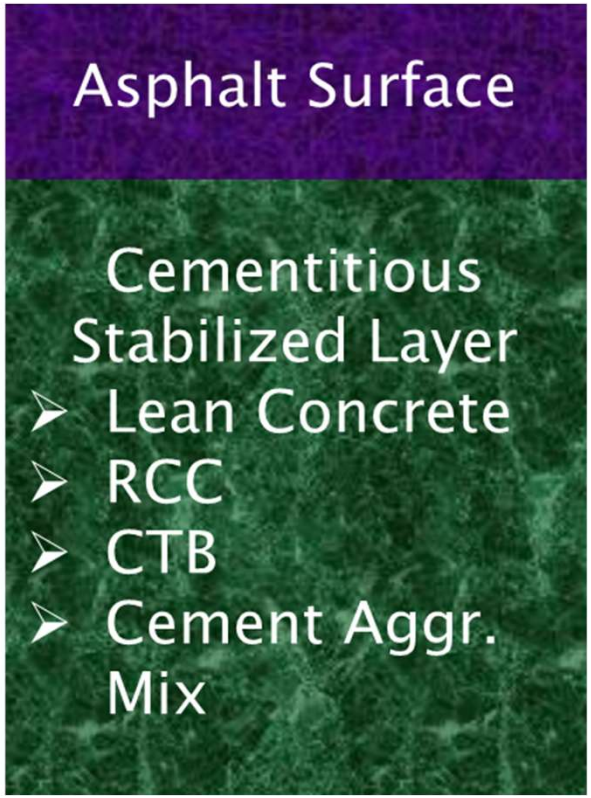
Designing New Composite Pavements

Suggested Decision Tree (table).

Surface Type	Base Strength	Type	Design Strategy	Check
Asphalt	Cementitious Stabilized; MOR < 400 psi, 28-days	Plain	New semi-rigid pavement in accordance with MEPDG MOP	
	Cementitious Stabilized; MOR > 400 psi, 28-days	JPC	Asphalt overlay of JPCP	New JPCP
		CRC	Asphalt overlay of CRCP	New CRCP
PCC	Cementitious Stabilized; MOR < 400 psi, 28-days	JPC, CRC	New JPCP or new CRCP	
	Cementitious Stabilized; MOR > 400 psi, 28-days	JPC	Bonded PCC overlay of JPCP	New JPCP
		CRC	~~*Bonded PCC overlay of CRCP*~~	New CRCP

Summary and Takeaways

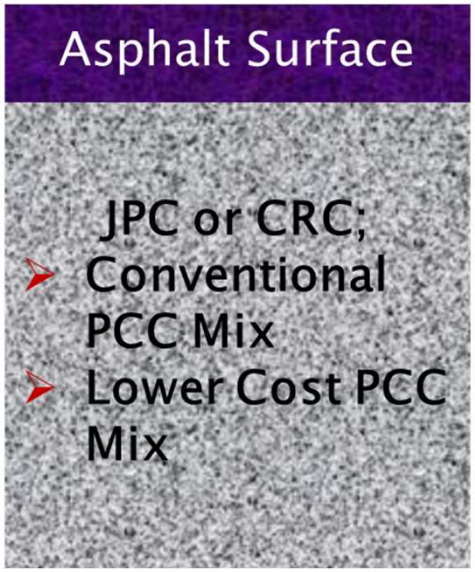
- Calibration coefficients for new semi-rigid pavement design.



V2.6 of the PMED software includes calibration for semi-rigid pavements.

Summary and Takeaways

- Calibration coefficients for new composite pavement design.



Use AC overlay of JPC or CRC calibration coefficients.

AC overlays of rigid pavements have been calibrated.

Use new JPCP or CRCP calibration coefficients.

Higher quality PCC surface mixes over lower cost PCC mixes has not been calibrated.

Summary and Takeaways

- Minimum layer thickness defined by the agency's design policy.

- Minimum thickness required by the software for the PCC wearing surface is 4 inches.

Summary and Takeaways

New AC/JPC Composite Pavement

1. Use AC overlay of JPCP design strategy.
2. AC overlay date is 1+ years from the JPC construction date.
3. Determine JPC layer thickness, excluding transverse reflection cracks.
4. Use the JPCP new design strategy to ensure faulting is less than the threshold value.

Note: Using the new JPCP design strategy, credit is not given to the AC wearing surface.

Summary and Takeaways

New AC/JPC Composite Pavement

5. Use saw and seal joints in AC wearing surface above the transverse joints in the JPC layer to control cracks.

Summary and Takeaways

New AC/CRC Composite Pavement

1. Use AC overlay of CRCP design strategy.
2. AC overlay date is 1+ years from the CRC construction date.
3. Determine CRC layer thickness.
4. Use the CRCP new design strategy to ensure all distresses are less than the threshold values.

Note: Using the new CRC design strategy, credit is not given to the AC wearing surface.

Summary and Takeaways

New PCC/JPC Composite Pavement

1. Use bonded PCC overlay of JPCP design strategy.
2. PCC overlay date is 1+ years from the JPC construction date.
3. Determine layer thickness of lower cost JPC layer.
4. Use the JPCP new design strategy to check and ensure faulting is less than the threshold value.

Note: Using the new JPCP design strategy, full credit is not given to the higher quality PCC surface layer.

Summary and Takeaways

New PCC/CRC Composite Pavement

1. ~~Use bonded PCC overlay of CRCP design strategy.~~
2. ~~PCC overlay date is 1+ years from the CRC construction date.~~
3. ~~Determine layer thickness of lower cost CRC layer.~~
4. Use the CRCP new design strategy to check and ensure all distresses are less than the threshold values.

Suggestions from SHRP2 Volume 2 Report, but there is no steel in the PCC wearing surface.

Note: Using the new CRCP design strategy, full credit is not given to the higher quality PCC surface layer.

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Summary and Takeaways

Remember:

For the PMED software overlay design strategies suggested for new composite pavement design, the Optimization Tool is only applicable to the overlay itself. Optimization of the new JPC and CRC layer is done manually.

FY 2022 – Webinar #3: Composite Pavement Design

Webinar Outline:

1. New Composite Pavements Defined
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3. Assumptions and Inputs
4. Summary and Takeaway Comments
5. Question and Answer Session

FY 2022 Webinar #3 New Composite Pavement Design

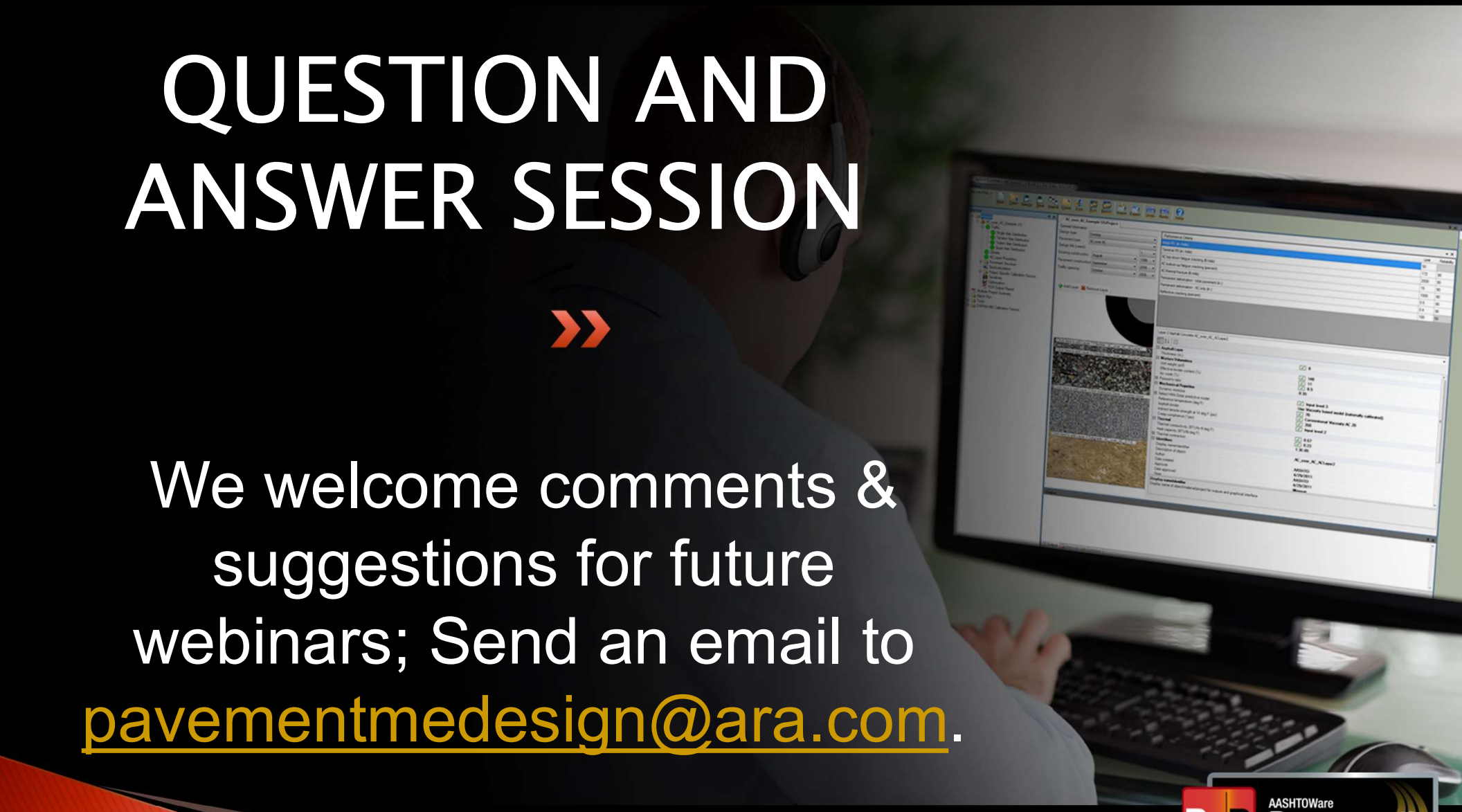
Poll 2: Questions 4, 5 and 6

4. Would you use the PMED software to design new composite pavements in the future?
   - ❑Yes
   - ❑No
   - ❑No opinion

5. Adding the new composite pavement design strategy to the PMED software?
   - ❑Highly important
   - ❑Would be beneficial
   - ❑Not important
   - ❑Neutral or no opinion

6. How valuable was this webinar to you?
   - ❑ Our agency/organization does not build this type of new pavement design strategy.
   - ❑ Highly valuable
   - ❑ Moderately valuable
   - ❑ Little value.
   - ❑ No value.

QUESTION AND ANSWER SESSION



We welcome comments & suggestions for future webinars; Send an email to pavementmedesign@ara.com.

Announcements

FY 2022 – Webinar Series, Remember:

- Webinar #4: Introduction to the Web-Application v3.0; June 22, 2022.

Thank you for Attending the Webinar!

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