Concrete Pavements

Parking lots, streets and local roads, bike paths

Amy Wedel, Director Concrete Pavements

ASCE Broward Chapter

November 6, 2018

Agenda

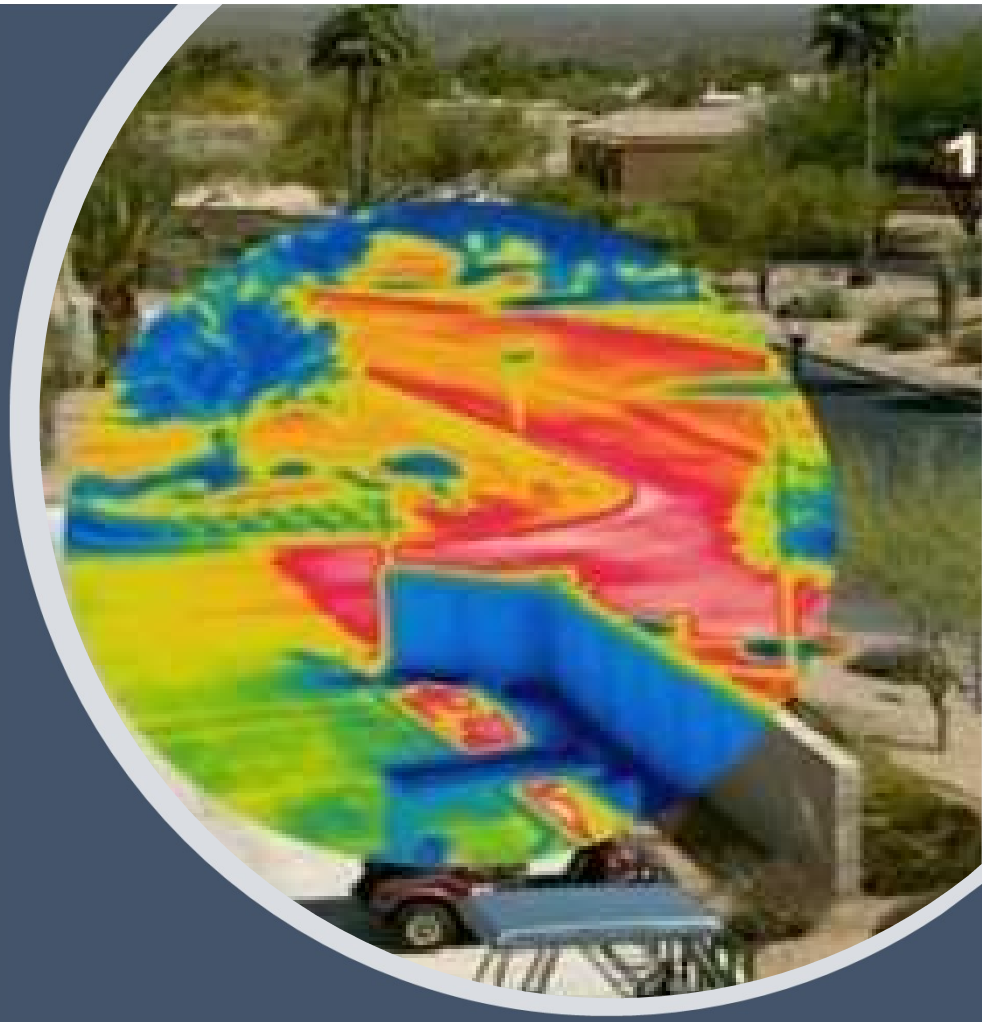
- Why Concrete?
- Tools and Resources
- Concrete Paving Applications

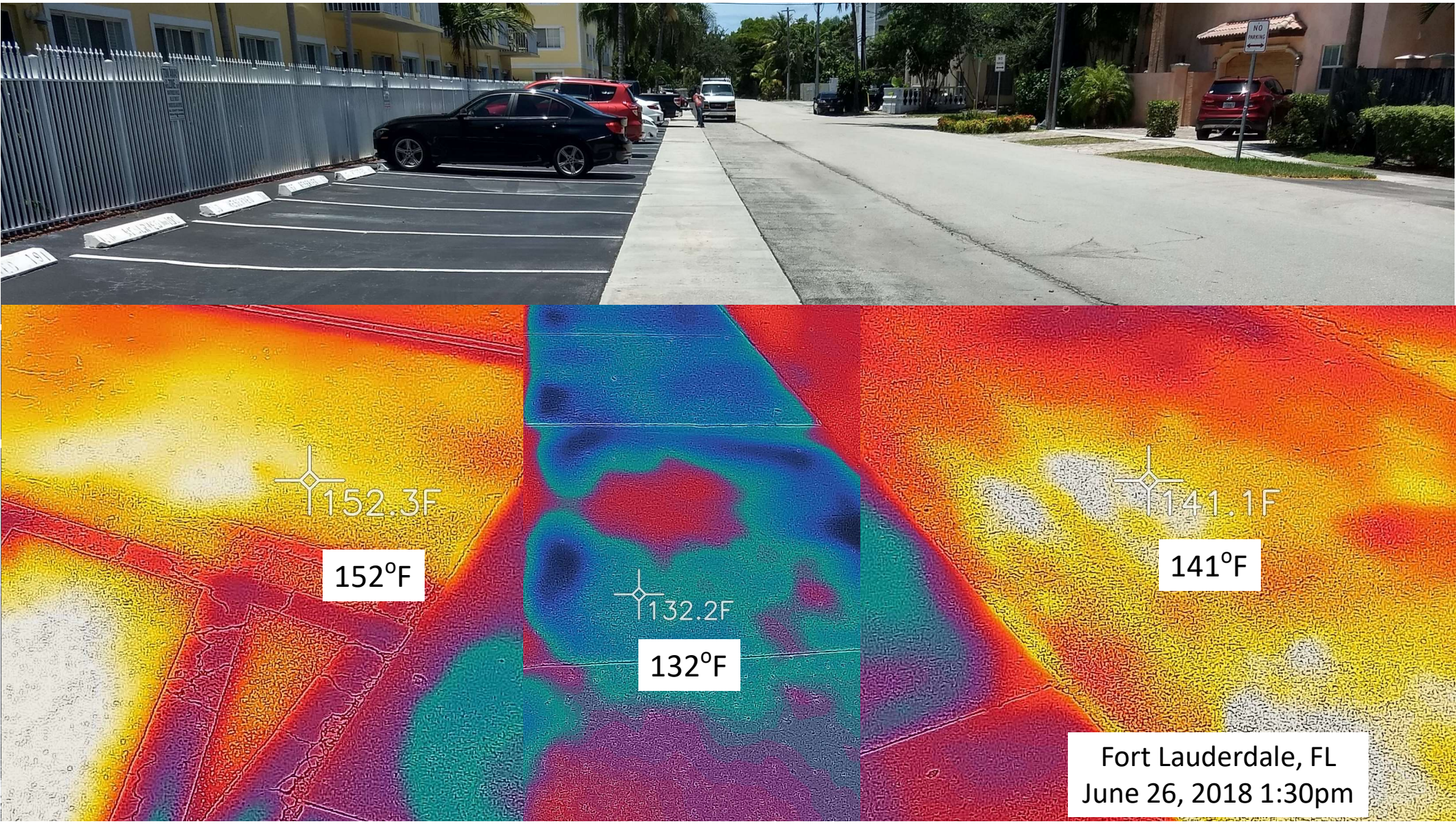
Why Concrete?

- Reflectivity
- Safety
- Low Life Cycle Cost
- Low Maintenance
- Resiliency
- Environmentally Friendly Material
- Beautiful

Reflectivity / Urban heat Islands

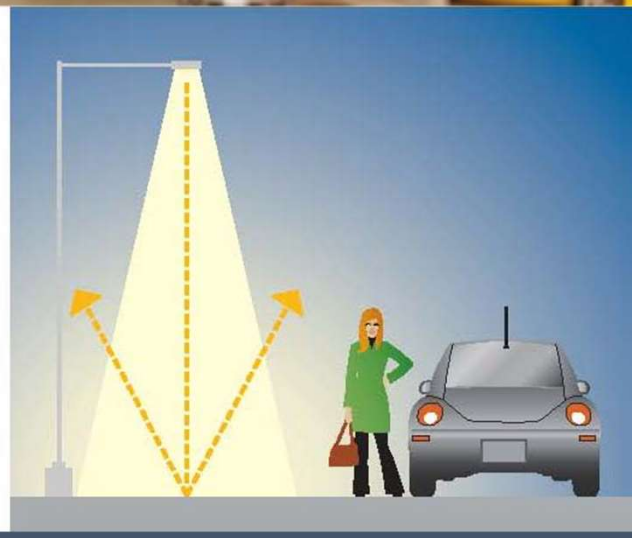
- Reduced urban heat islands
  - 10 to 20 degrees cooler
- Reduced AC needs
  - 1 degree equals 1.5% change in energy consumption
- Improve air quality




152.3F
152°F
132.2F
132°F
141.1F
141°F
Fort Lauderdale, FL
June 26, 2018 1:30pm

Reflectivity / Safety

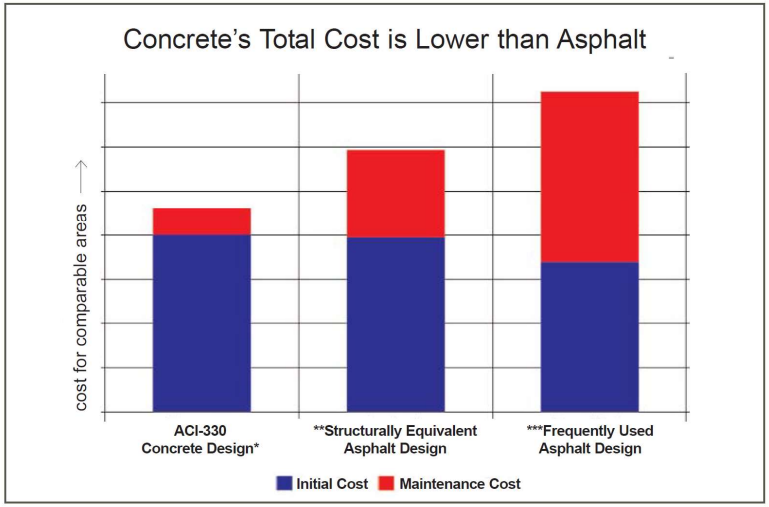
- Better visibility reduces crime
- Better visibility reduces accidents



Low Life Cycle Cost

- Competitive first costs
- Lowest costs in 5 to 10 years

Lowest cost of ownership!



Concrete parking delivers value: Factoring initial placement, maintenance and repair costs, compared to asphalt, concrete costs less over its useful life.

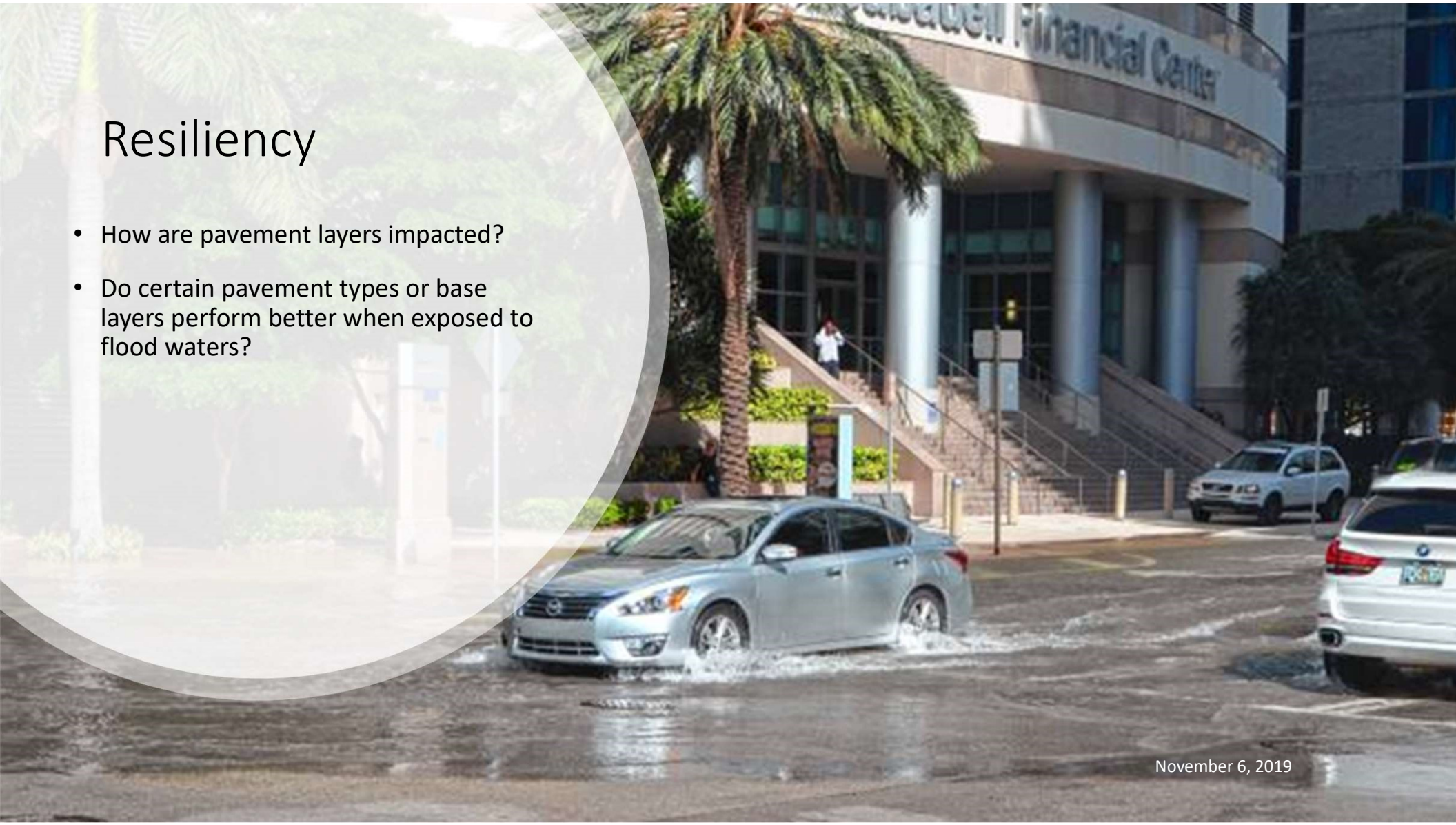
*ACI-330 is the American Concrete Institute's authoritative document on concrete parking area design.
** A structurally equivalent asphalt design is engineered to have the same load carrying capacity as the ACI-330 Concrete Design.
***While the frequently used asphalt design may be the the cheapest to buy, because it is often under-designed in load carrying capacity, it is the most expensive to own.

Minimal Maintenance

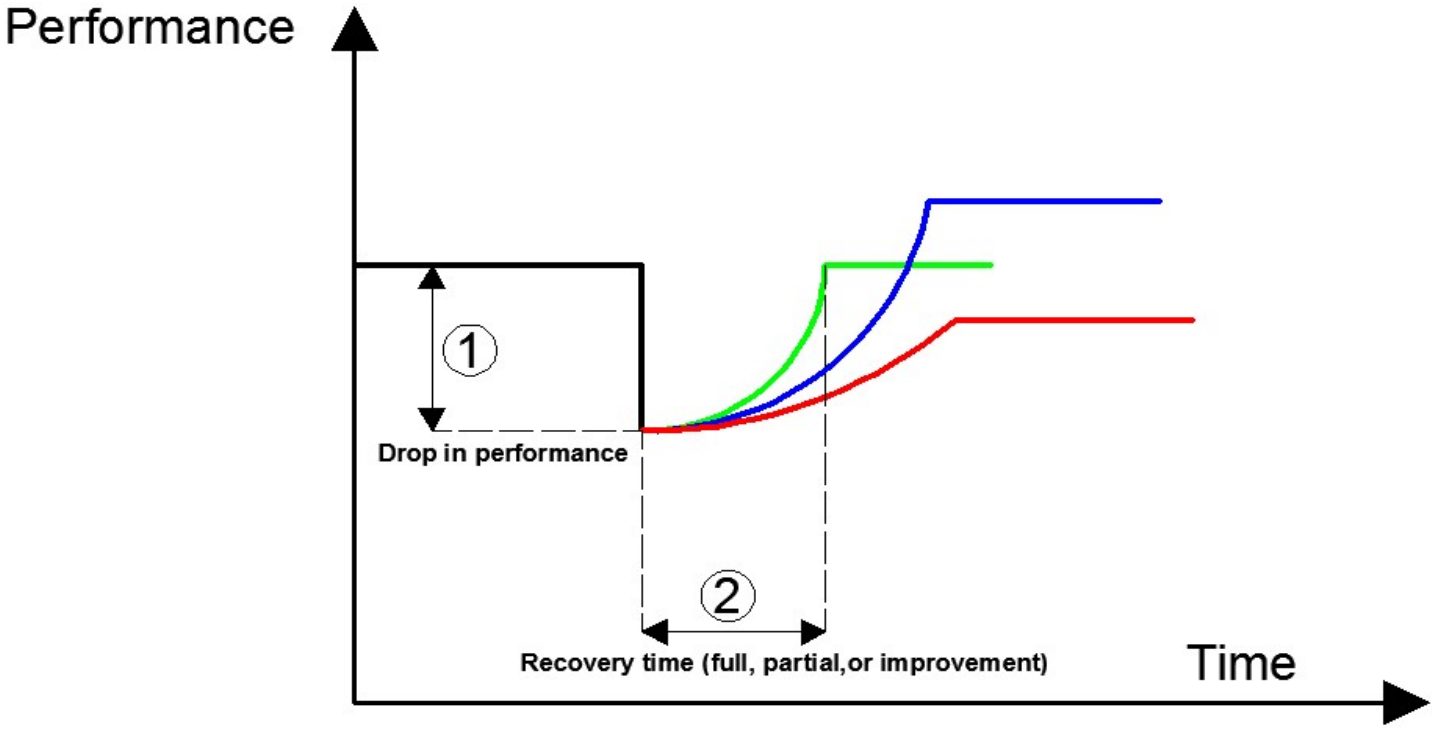
- No closing for repairs
- No resurfacing
- No potholes, bumps, wrinkles

Resiliency

- How are pavement layers impacted?
- Do certain pavement types or base layers perform better when exposed to flood waters?



PAVEMENT RESILIENCE



Green is more resilient than Red because it has a faster recovery time

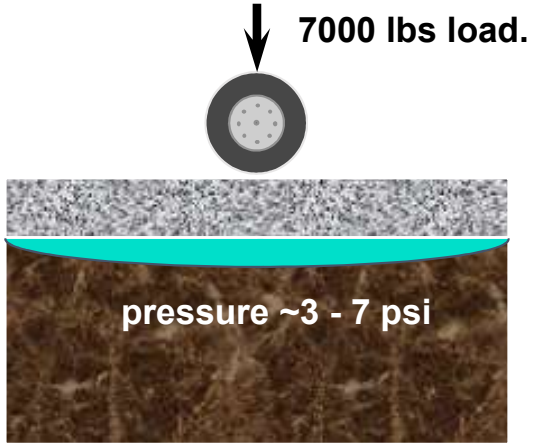
Pavement Resilience with respect to an event (eg. Flooding) is characterized by two parameters:

1. Drop in performance, induced by a the event (eg. reduced ability to carry load).
2. Recovery time to reinstate or improve performance (LCA, LCCA).

CONCRETE AND ASPHALT PAVEMENTS ARE DIFFERENT DUE TO HOW THEY DELIVER LOADS TO THE SUBGRADE

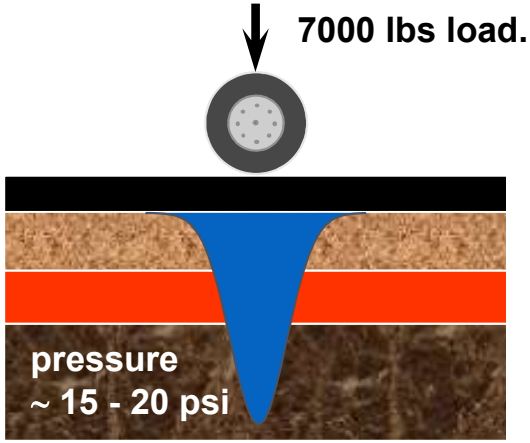
Concrete Pavements are Rigid

- Concrete carries the load and distributes it over a large area
- Minor deflection
- Low subgrade contact pressure
- Subgrade uniformity is more important than strength



Asphalt Pavements are Flexible

- The load is more concentrated and transferred to the underlying layers
- Higher deflection
- Subgrade, base/subbase strength are important
- Usually require more layers and greater thickness in order to protect the subgrade



Concrete's rigidity spreads the load over a large area & keeps pressures on the subgrade low
(therefore the flooded support system does not impact the load carrying capacity to the same degree as asphalt)

WHEN LOOKING AT FLOODING, NEED TO DISTINGUISH BETWEEN INUNDATION AND WASHOUT IMPACTS

Inundation

The rise of water and flooding that submerges the pavement, but has no rapid flow or current

Pavement type does have an impact

Washout

Rapid flow of flood water / high current that scours and washes out the pavement structure layers

Pavement type has little impact

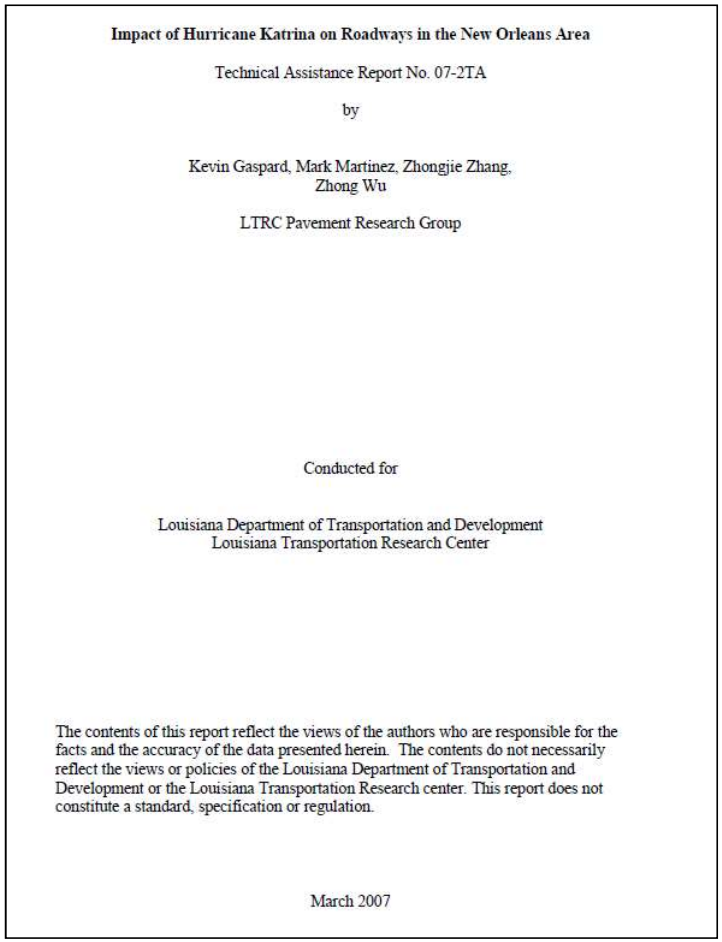
Relief and Rescue Efforts Must take place!
Pavements are loaded…Are their lives shortened?

CAROLINAS CONCRETE PAVING ASSOCIATION

RESEARCH LOOKING AT PAVEMENTS THAT WERE SUBMERGED BY HURRICANE KATRINA

Key Findings

- Pavements that were submerged were found to be weaker than non-submerged pavements
- Asphalt pavements
  - Overall strength loss was equivalent to two inches of new asphalt
  - Duration of submergence was not a factor – damage occurred regardless of the length of time the pavement was submerged
  - Estimated cost of rehabilitating the 200 miles of submerged state (asphalt) roads would be **$50 million**
- Concrete Pavements
  - **Little relative loss of strength** due to flooded versus non-flooded conditions
  - Mr (subgrade strength) for concrete pavements is similar for submerged and non-submerged pavements
  - No information given on repairs or repair costs



Impact of Hurricane Katrina on Roadways in the New Orleans Area

Technical Assistance Report No. 07-2TA

by

Kevin Gaspard, Mark Martinez, Zhongjie Zhang,
Zhong Wu

LTRC Pavement Research Group

Conducted for

Louisiana Department of Transportation and Development
Louisiana Transportation Research Center

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the views or policies of the Louisiana Department of Transportation and Development or the Louisiana Transportation Research center. This report does not constitute a standard, specification or regulation.

March 2007

Impact of Hurricane Katrina on Roadways in the New Orleans Area, Technical Assistance Report No. 07-2TA
Kevin Gaspard, Mark Martinez, Zhongjie Zhang, and Zhong Wu; LTRC Pavement Research Group, March 2007

ROADWAYS ARE ECONOMIC ENGINES THAT CAN NOT BE CLOSED

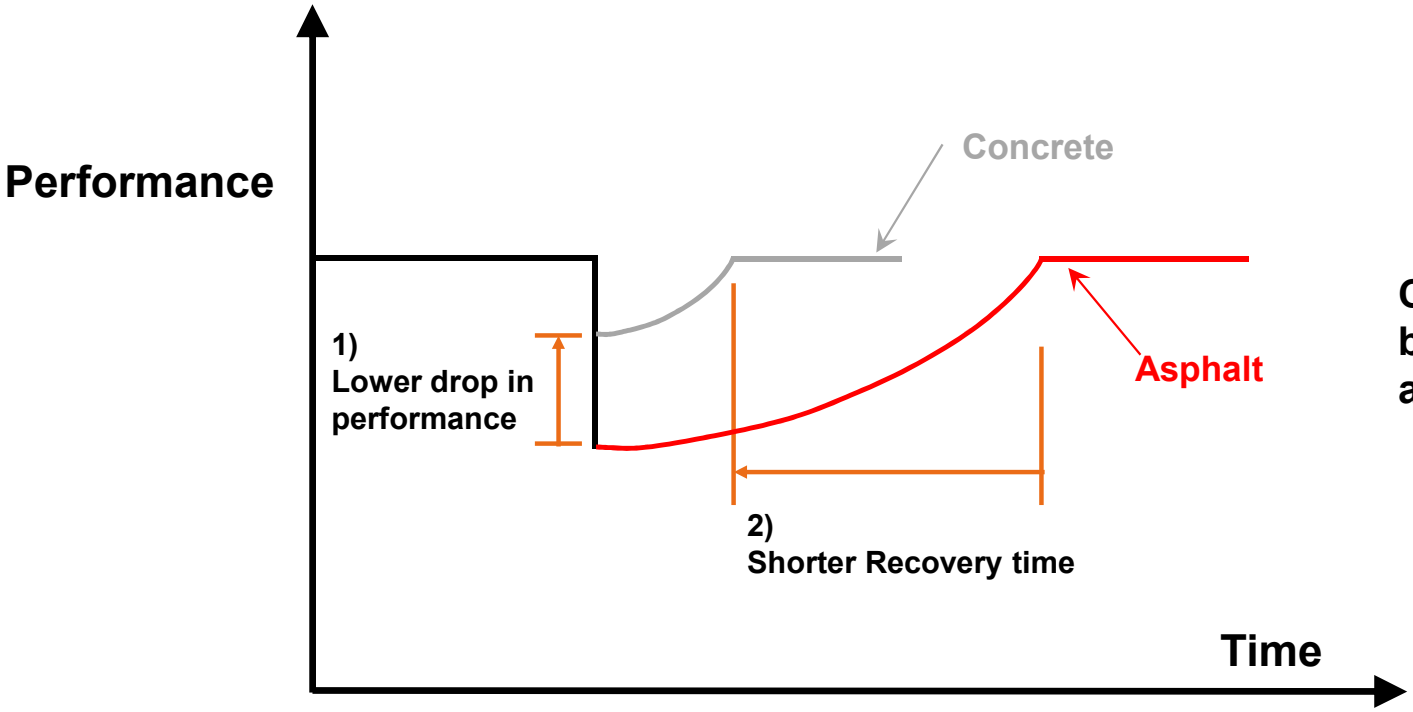
Pavement is a concrete roadway with thin Asphalt Overlay

I-45 in Houston TX after heavy rains flooded the interstate (May 2015)

May 26, 2015

Same road 3 days later

CONCRETE PAVEMENT'S STIFFNESS MEANS IT IS MORE RESILIENT TO INUNDATION FLOODING



Concrete is less impacted by subgrade strength loss and recovers faster

Pavement Resilience with respect to an event (eg. Flooding) is characterized by two parameters:

1. Drop in performance, induced by a the event (eg. reduced ability to carry load).
2. Recovery time to reinstate or improve performance (LCA, LCCA).

Environmentally Friendly Material

- Local materials
- Recycled materials
- No hazardous materials
- Stormwater management (pervious concrete)

Beautiful

- Flexible Design Options
  - Colored
  - Texture / Stamped
  - Combined with pavers

Benefits Recap

Owner

- Resilient
- Comfort
- Energy savings
- Safety
- Low Life Cycle costs
- Low maintenance
- Beautiful

Contractor

- Faster construction

Community

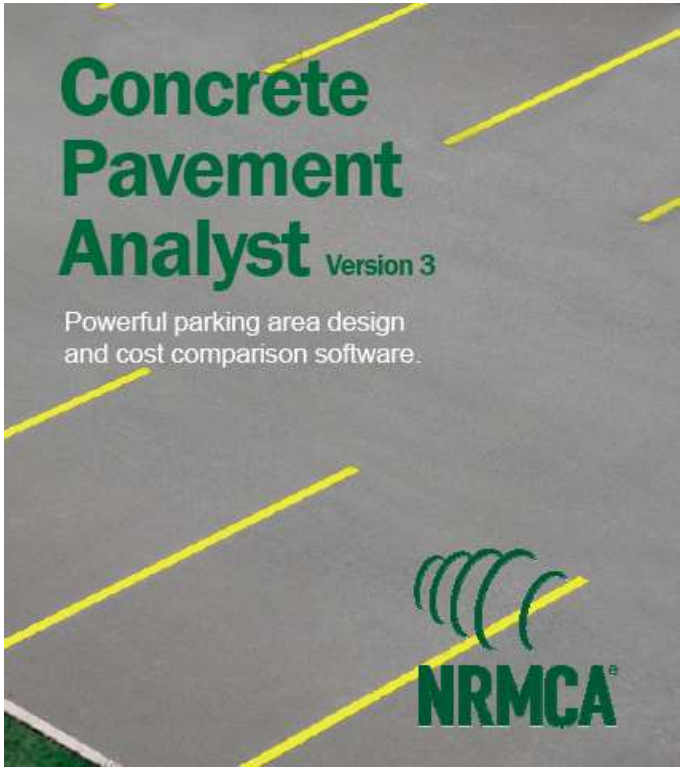
- Resilient
- Cool
- Clean
- Safe
- Beautiful
- Environmentally responsible material

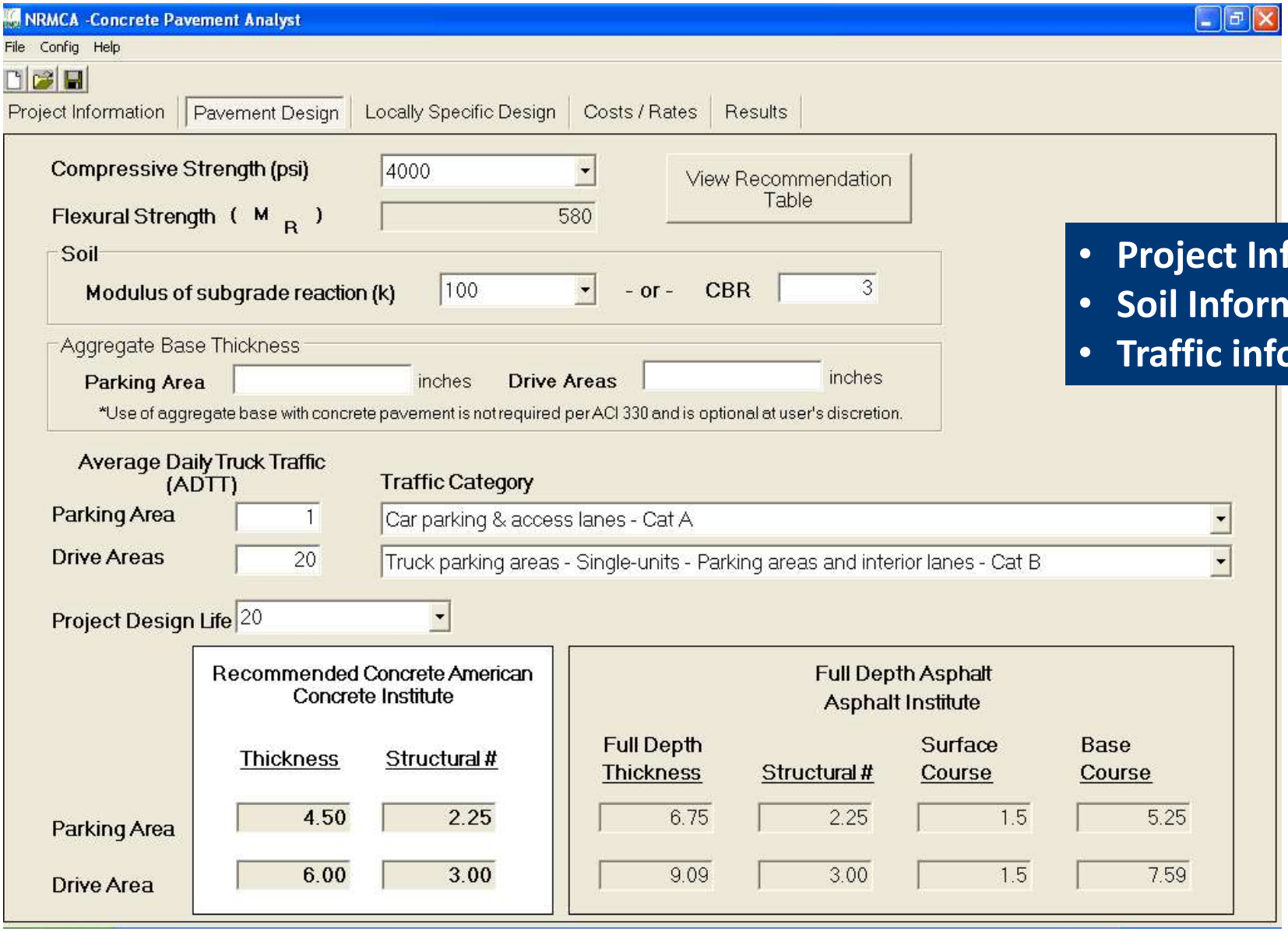
Tools & Resources

- Concrete Pavement Analysis
- PavementDesigner.org
- Design Elements
- Certified Contractors
- References and Resources

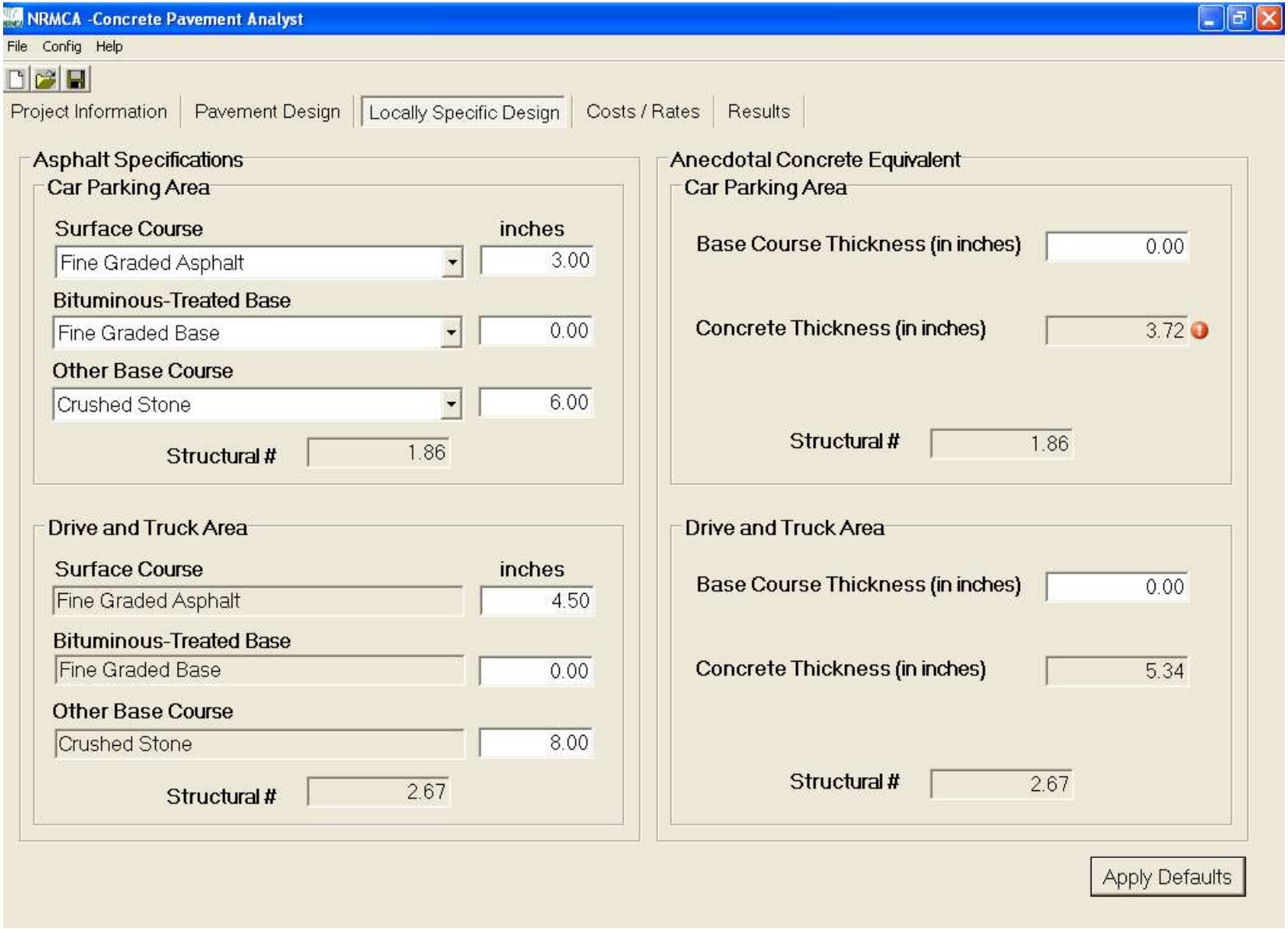
Concrete Pavement Analyst

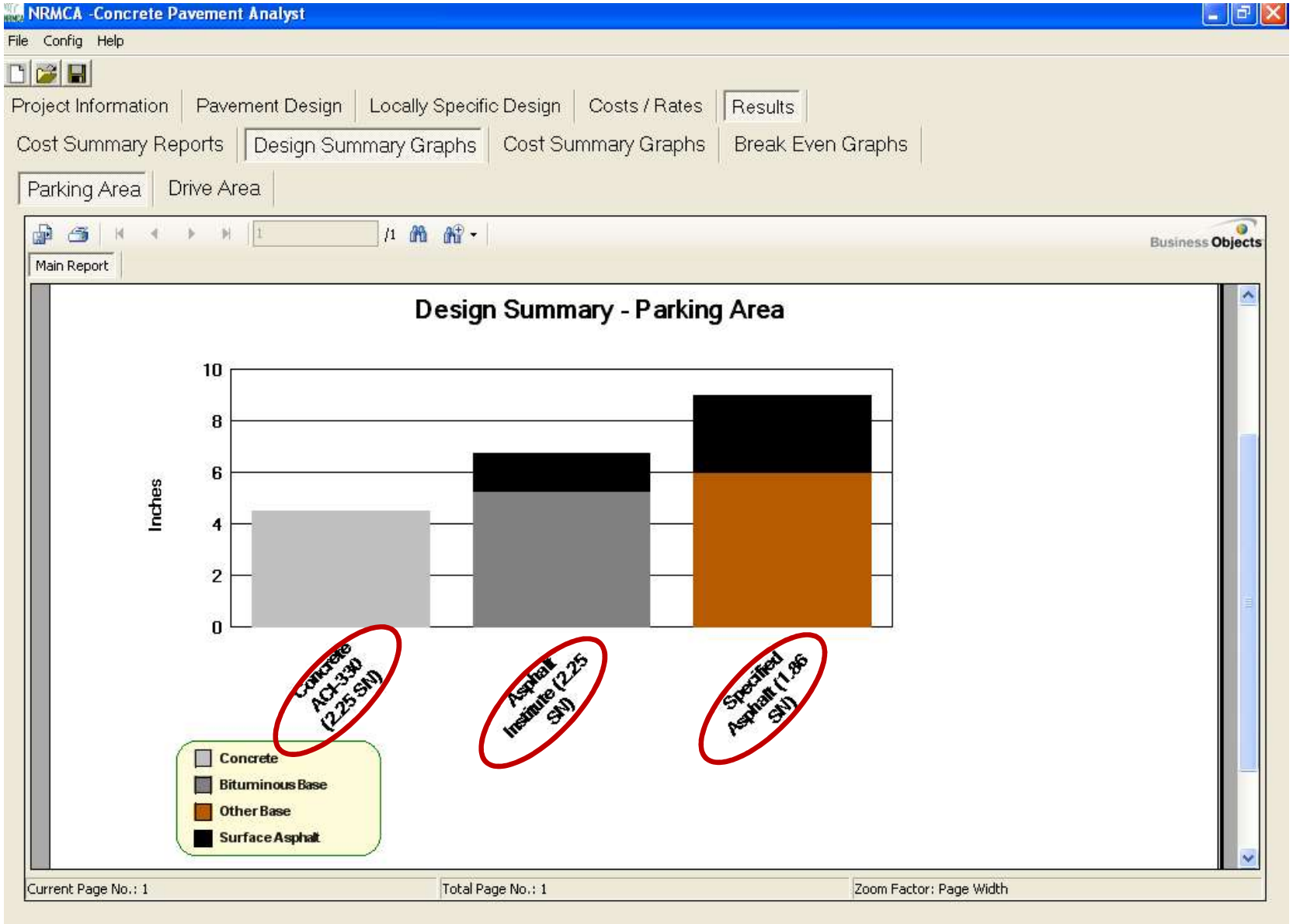
- Uses Customer Inputs
- Compares Asphalt and Concrete designs per industry standard specifications
- Also compares Local Design Criteria
- Provides design and life-cycle cost comparisons
- Allows user to make a more educated decision

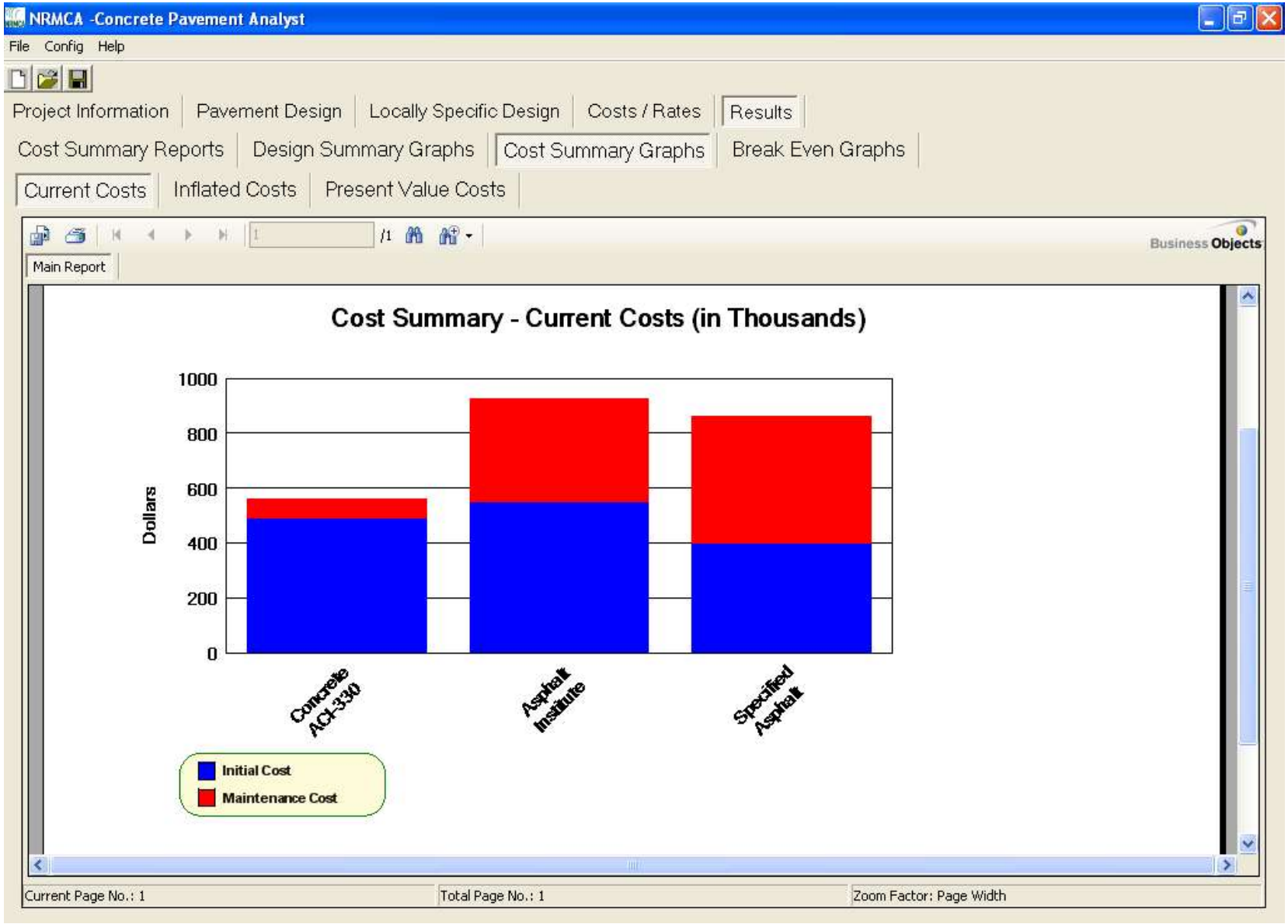




- **Project Information**
- **Soil Information**
- **Traffic information**


NRMCA -Concrete Pavement Analyst
File Config Help
Project Information
Pavement Design
Locally Specific Design
Costs / Rates
Results
Asphalt Specifications
Car Parking Area
Surface Course
inches
Fine Graded Asphalt
3.00
Bituminous-Treated Base
Fine Graded Base
0.00
Other Base Course
Crushed Stone
6.00
Structural #
1.86
Drive and Truck Area
Surface Course
inches
Fine Graded Asphalt
4.50
Bituminous-Treated Base
Fine Graded Base
0.00
Other Base Course
Crushed Stone
8.00
Structural #
2.67
Anecdotal Concrete Equivalent
Car Parking Area
Base Course Thickness (in inches)
0.00
Concrete Thickness (in inches)
3.72
Structural #
1.86
Drive and Truck Area
Base Course Thickness (in inches)
0.00
Concrete Thickness (in inches)
5.34
Structural #
2.67
Apply Defaults


NRMCA -Concrete Pavement Analyst
File Config Help
Project Information
Pavement Design
Locally Specific Design
Costs / Rates
Results
Cost Summary Reports
Design Summary Graphs
Cost Summary Graphs
Break Even Graphs
Parking Area
Drive Area
Business Objects
Main Report
Design Summary - Parking Area
Inches
10
8
6
4
2
0
Concrete ACI-330 (2.25 SN)
Asphalt Institute (2.25 SN)
Specified Asphalt (1.86 SN)
Concrete
Bituminous Base
Other Base
Surface Asphalt
Current Page No.: 1
Total Page No.: 1
Zoom Factor: Page Width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Project Information
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Costs / Rates
Results
Cost Summary Reports
Design Summary Graphs
Cost Summary Graphs
Break Even Graphs
Current Costs
Inflated Costs
Present Value Costs
Business Objects
Main Report
Cost Summary - Current Costs (in Thousands)
Dollars
1000
800
600
400
200
0
Concrete ACI-330
Asphalt Institute
Specified Asphalt
Initial Cost
Maintenance Cost
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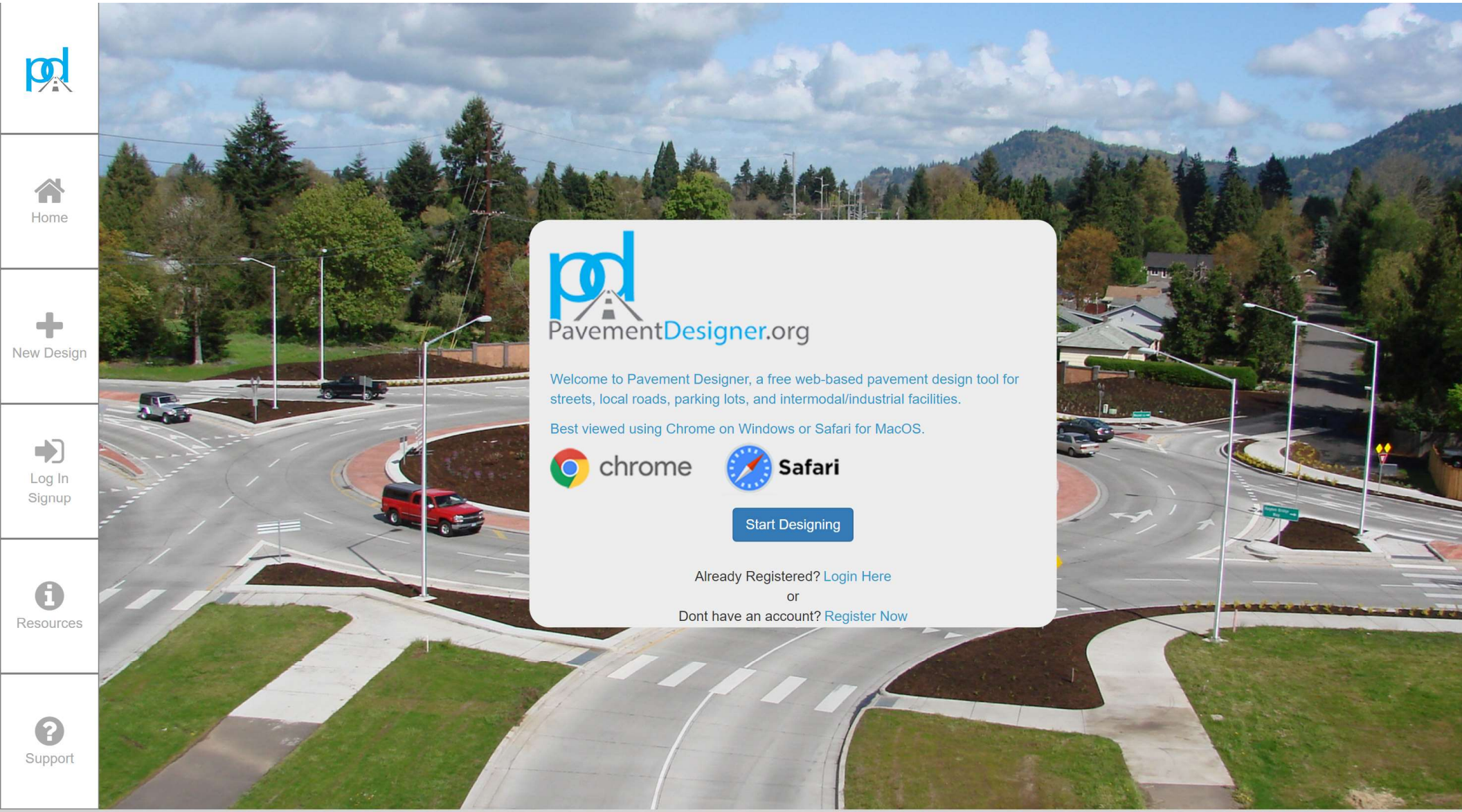
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PavementDesigner.org
Welcome to Pavement Designer, a free web-based pavement design tool for streets, local roads, parking lots, and intermodal/industrial facilities.
Best viewed using Chrome on Windows or Safari for MacOS.
chrome
Safari
Start Designing
Already Registered? Login Here
or
Dont have an account? Register Now


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Select Project Type
PARKING
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November 6, 2019
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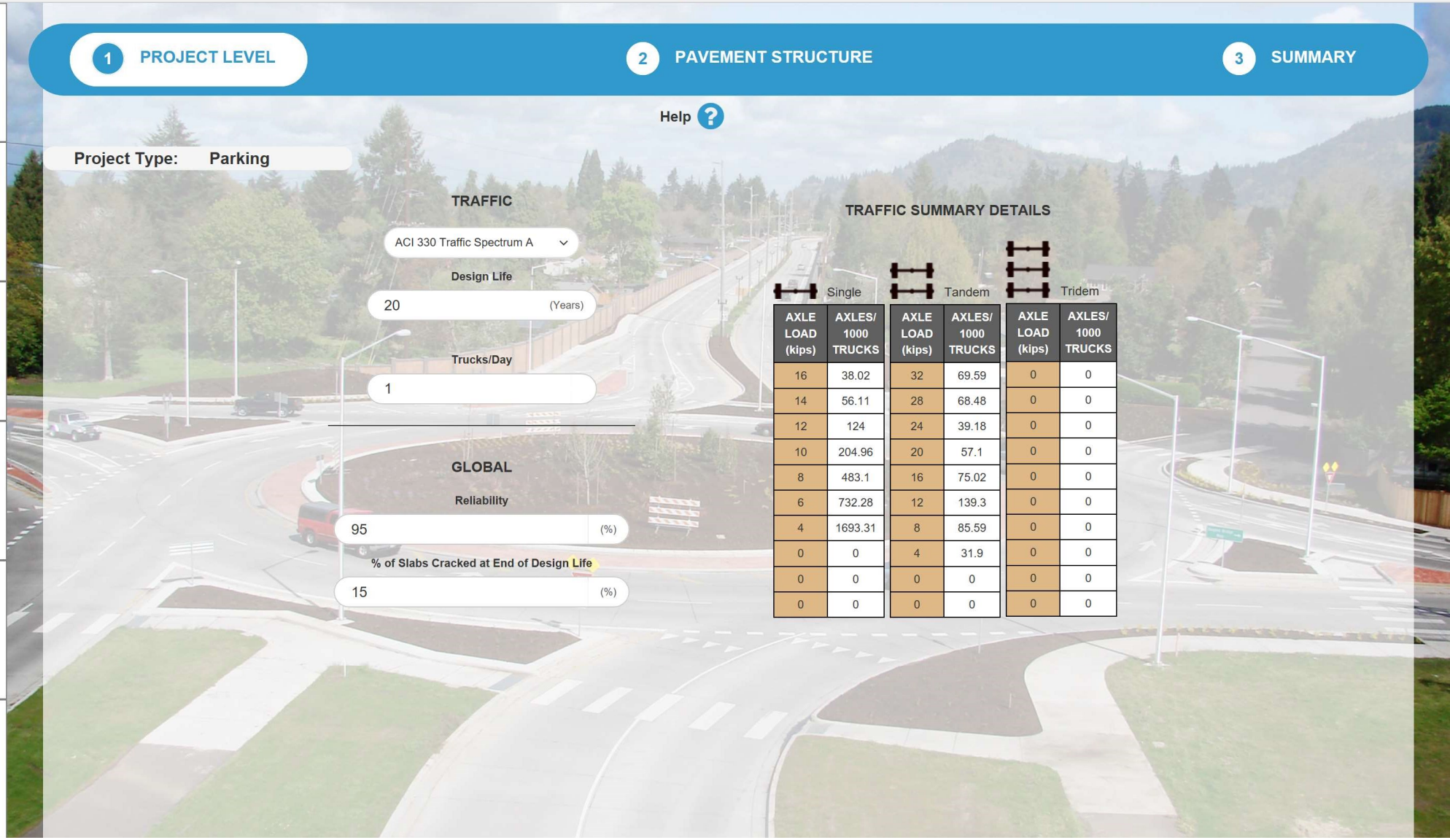


Help

Project Type: Parking

TRAFFIC

ACI 330 Traffic Spectrum A

Design Life

20 (Years)

Trucks/Day

1

GLOBAL

Reliability

95 (%)

% of Slabs Cracked at End of Design Life

15 (%)

TRAFFIC SUMMARY DETAILS

Single		Tandem		Tridem	
AXLE LOAD (kips)	AXLES/ 1000 TRUCKS	AXLE LOAD (kips)	AXLES/ 1000 TRUCKS	AXLE LOAD (kips)	AXLES/ 1000 TRUCKS
16	38.02	32	69.59	0	0
14	56.11	28	68.48	0	0
12	124	24	39.18	0	0
10	204.96	20	57.1	0	0
8	483.1	16	75.02	0	0
6	732.28	12	139.3	0	0
4	1693.31	8	85.59	0	0
0	0	4	31.9	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Project Type: Parking

SUBGRADE SOIL TYPES & APPROXIMATE SUPPORT VALUES

SELECT SOIL TYPE	SUPPORT	k, psi/in	CBR	R-Value	SSV
Fine-Grained Soils in which silt and clay-size particles predominate	LOW	75 - 120	2.5 - 3.5	10 - 22	2.3 - 3.1
Sands and sand-gravel mixtures with moderate amounts of silt and clay	MEDIUM	130 - 170	4.5 - 7.5	20 - 41	3.5 - 4.9
Sand and sand-gravel mixtures relatively free of plastic fines	HIGH	180 - 220	8.5 - 12	45 - 52	5.3 - 6.1

Help

SUBGRADE

Subgrade CBR Value: 6

Calculated MRSG Value: 6,618 psi

CONCRETE

Compressive Strength

Compressive Strength: 4,000 psi

Modulus of Elasticity: 4,000,000 psi

Calculated Flexural Strength: 580 psi

STRUCTURE

Subbase Layers: 0

Layer Type	Resilient Modulus	Layer Thickness
PARKING CONCRETE SURFACE		
SUBGRADE		

Calculated Composite K-Value of Substructure: 154 psi/in

Override ☐

Project Type: Parking

Calculated Minimum Thickness

4.55 in

Recommended Design Thickness

4.75 in

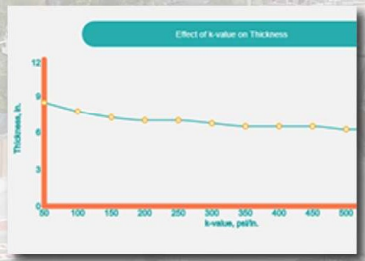
Maximum Joint Spacing

10 ft

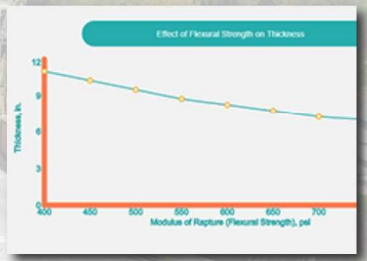
PavementDesigner.org

Analysis and Guidance

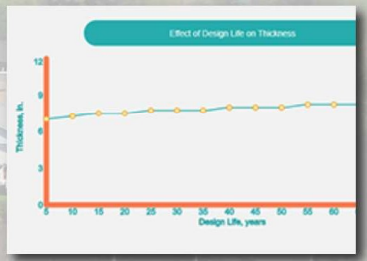
SENSITIVITY | CRACKING | EROSION | JOINT SPACING



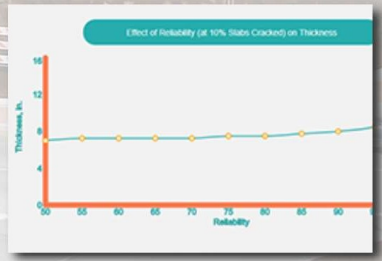
K-Value



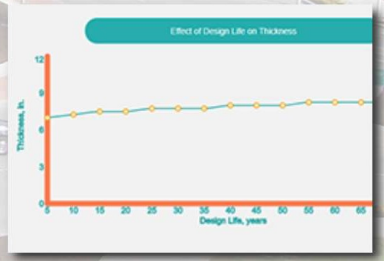
Flexural Strength



Design Life



Reliability



% Slabs Cracked

To see favorites here, select ☆≡ then ☆, and drag to the Favorites Bar folder. Or import from another browser. Import favorites

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1 PROJECT LEVEL

2 PAVEMENT STRUCTURE

3 SUMMARY

Project Type: Parking

Calculated Minimum Thickness

4.55 in

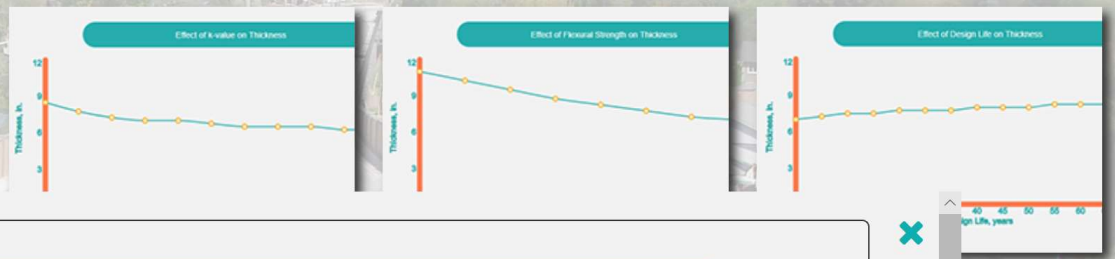
Recommended Design Thickness

4.75 in

Maxi

Analysis and Guidance

SENSITIVITY | CRACKING | EROSION | JOINT SPACING



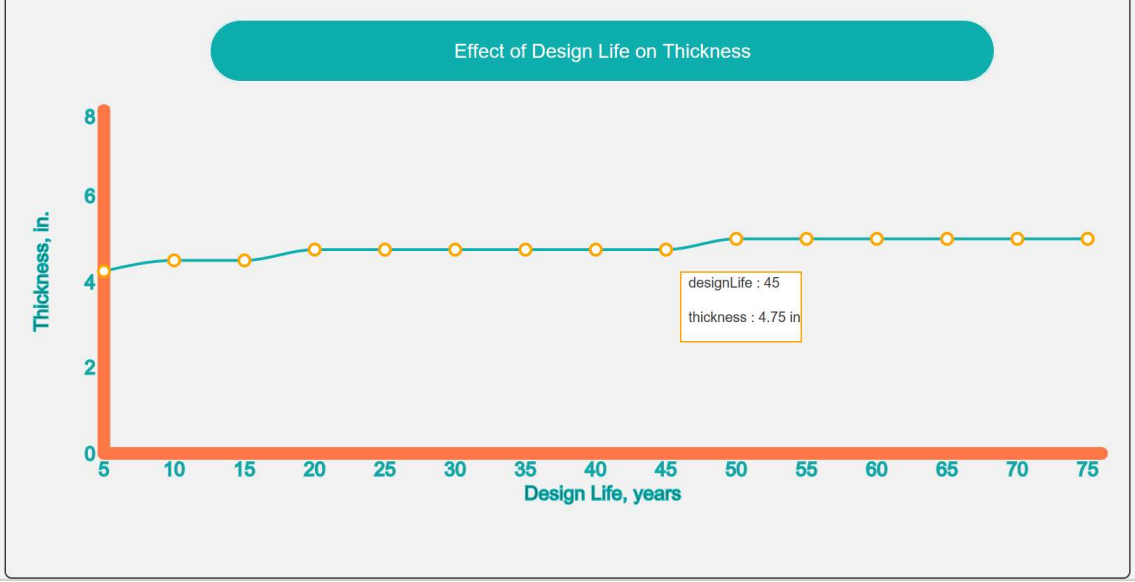
K-value

CONCRETE STRENGTH

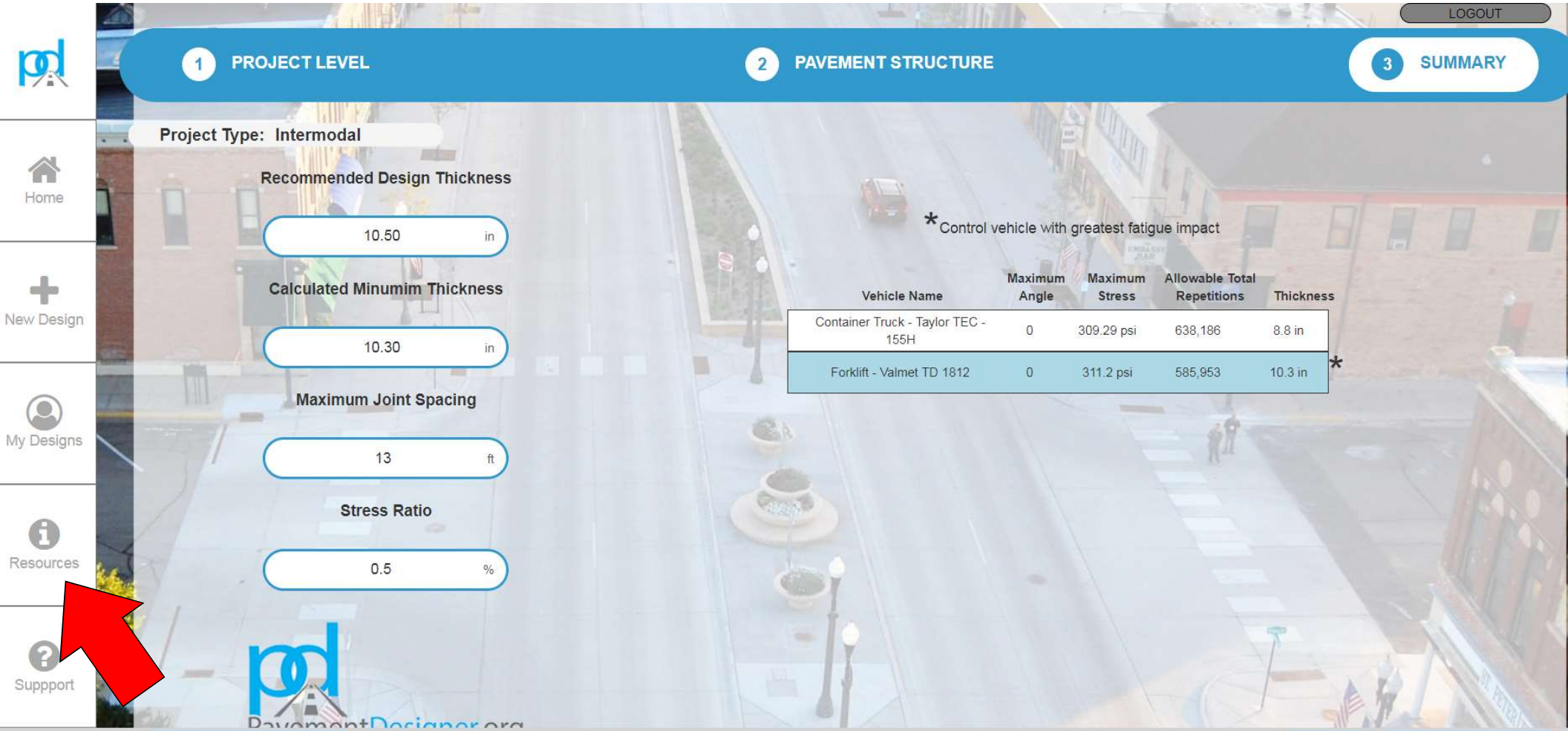
DESIGN LIFE

RELIABILITY

SLABS CRACKED

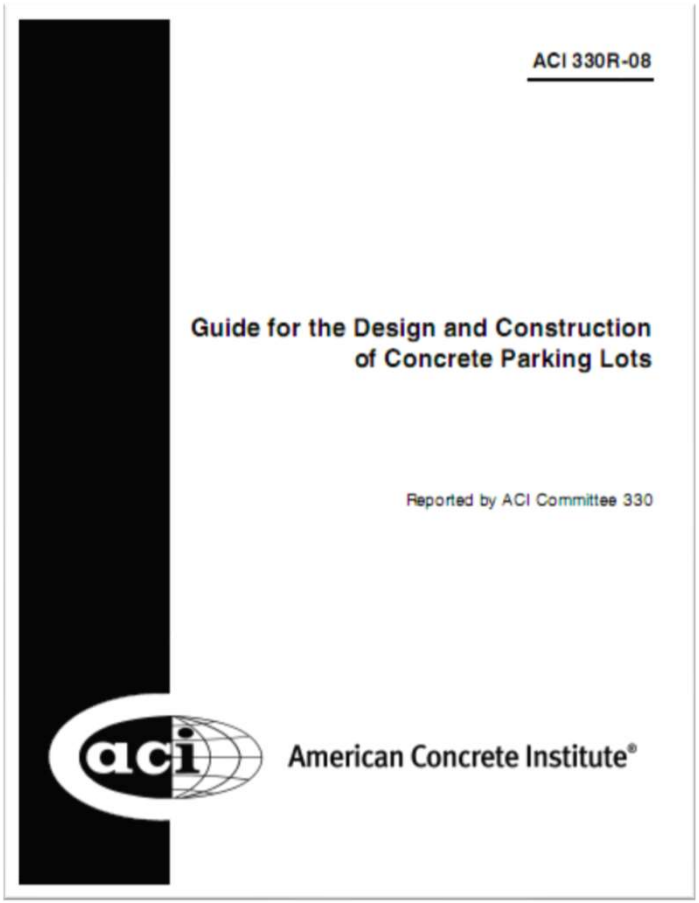


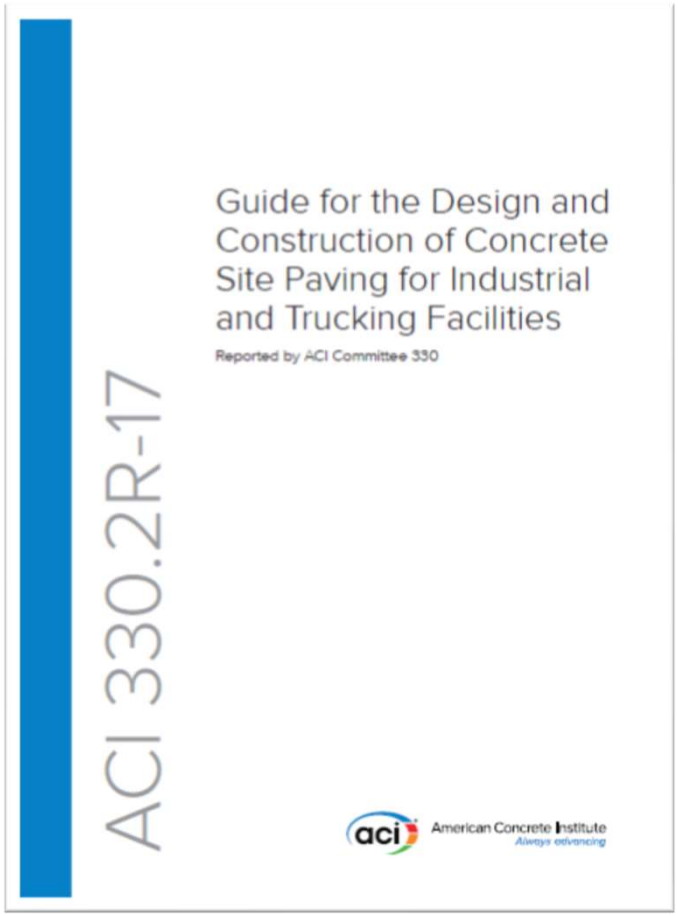
November 6, 2019



Pavementdesigner.org

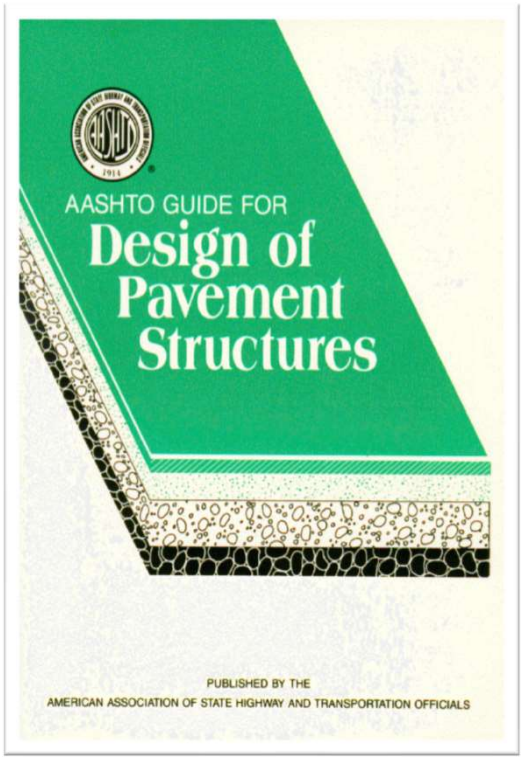
ACI 330 -Concrete parking lots

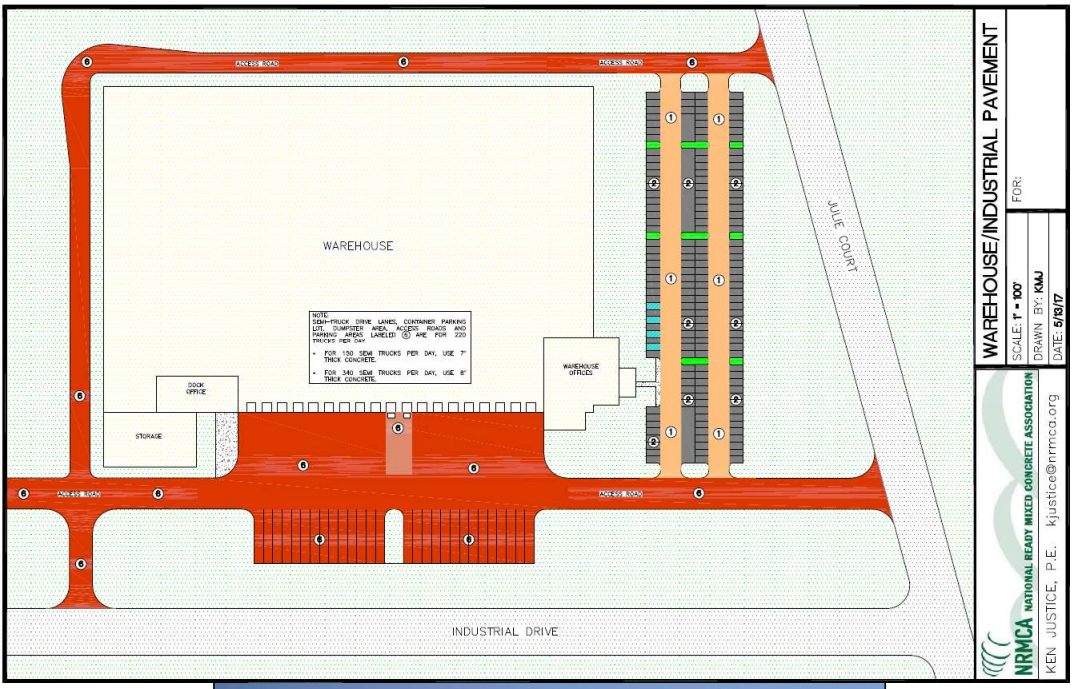




AASHTO 93

AASHTO Pavement ME





Distribution Center Project

1,200,000 s.f. exterior pavement

Old Concrete Design:

- AASHTO 93 - 9 ¼” with 15’ joint spacing

Proposed Design for Cost Saving:

- Asphalt throughout

New Concrete Design:

- Heavy Duty – 7” with 12’ joint spacing
- Medium Duty – 5.5” with 6’ joint spacing
- Light Duty – 4” with 6’ joint spacing

Design Elements – Contraction joints

- **Timing:** As soon as you can get a clean cut, max 8 - 12 hours
- **Spacing:** Recommendation of 2.5 times the depth in feet (24”-36”)
  - 4” thick: 10’ max (4 x 2.5)
  - Panel shall be kept as square as possible 1.5:1 (Length to width ratio)
- **Depth:** Minimum of ¼ of the depth: 8” thick = 2” deep (Recommended t/3)

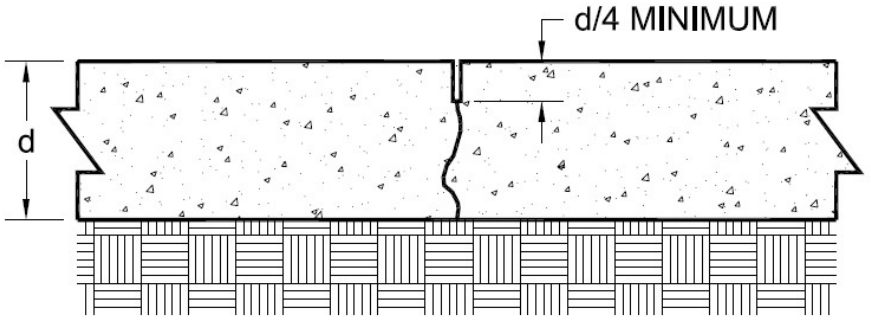


Table 3.5—Spacing between joints

Pavement thickness, in. (mm)	Maximum spacing, ft (m)
4, 4.5 (100, 113)	10 (3.0)
5, 5.5 (125, 140)	12.5 (3.8)
6 or greater (150 or greater)	15 (4.5)

Jointing Layouts: Corners, acute angles, edges with extreme curvature

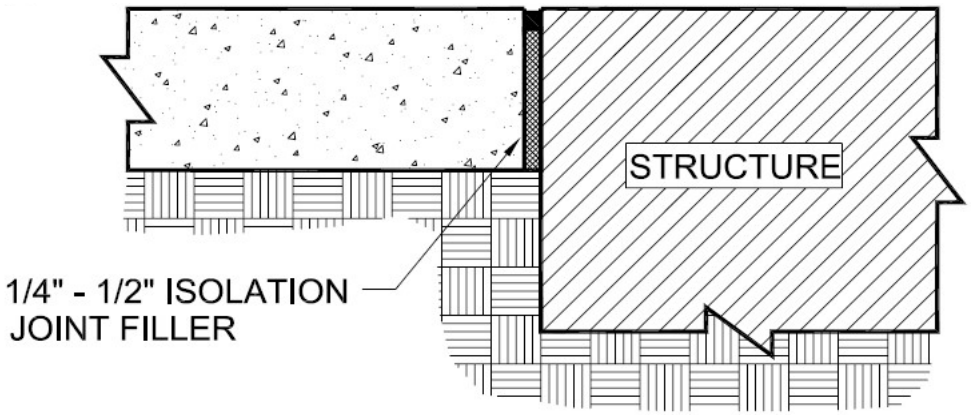
Carry joint through curb
(integral curb shown)

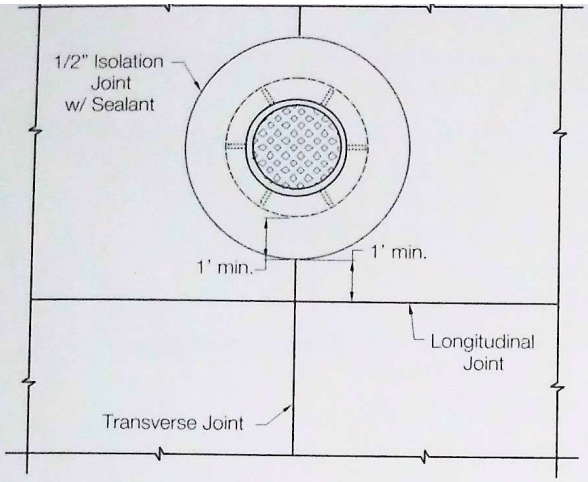
Intersect joints
(Avoids acute angles)

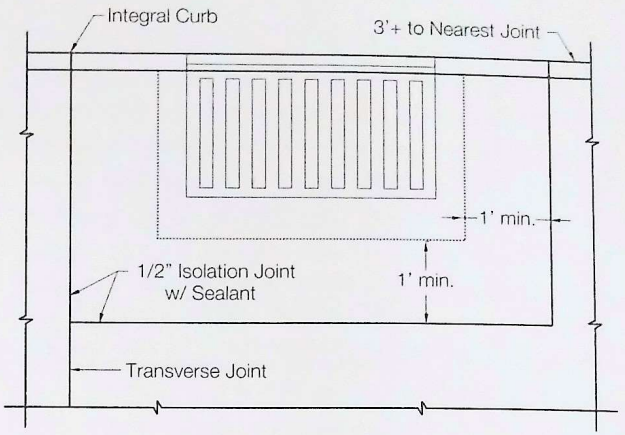
Intersect at corners

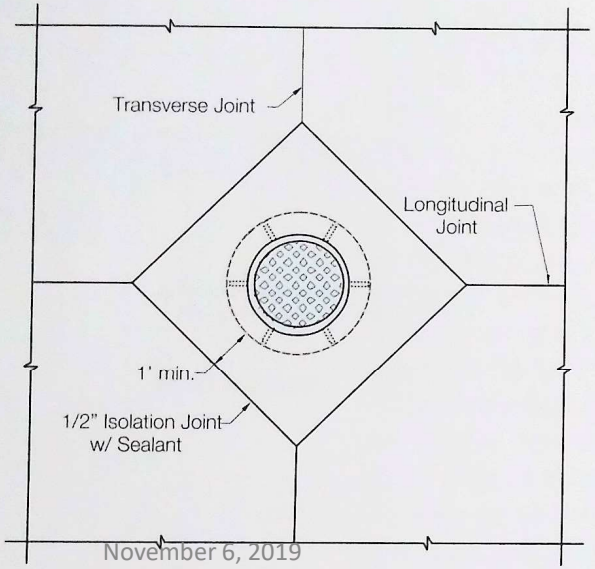
Design Elements – Isolation joints

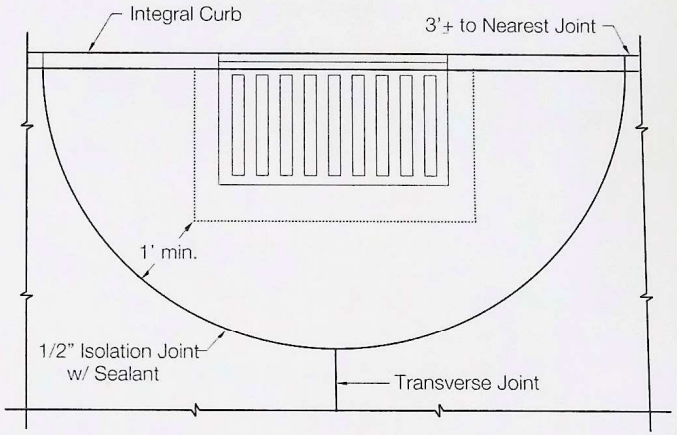
- …are sometimes called expansion joints but should generally not be used to provide for expansion. They provide no load transfer and should not be used as regularly spaced joints in a joint layout. Their proper use is to isolate fixed objects, providing for slight differential




1/2" Isolation Joint w/ Sealant
1' min.
1' min.
Longitudinal Joint
Transverse Joint

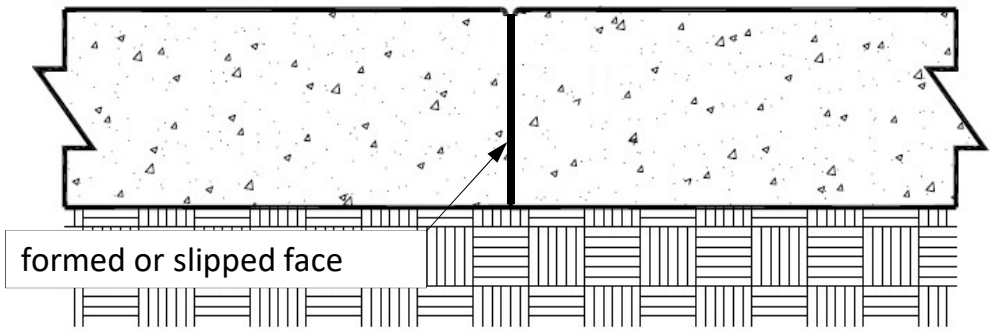

Integral Curb
3'+ to Nearest Joint
1' min.
1/2" Isolation Joint w/ Sealant
1' min.
Transverse Joint


Transverse Joint
Longitudinal Joint
1' min.
1/2" Isolation Joint w/ Sealant

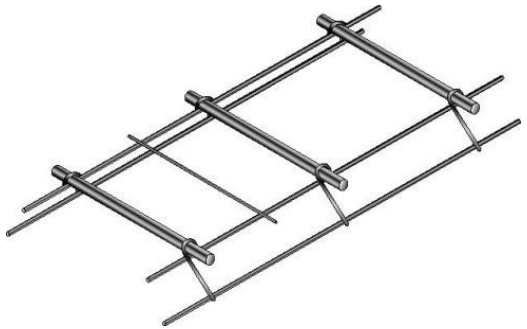

Integral Curb
3'+ to Nearest Joint
1' min.
1/2" Isolation Joint w/ Sealant
Transverse Joint

Design Elements – Construction joints

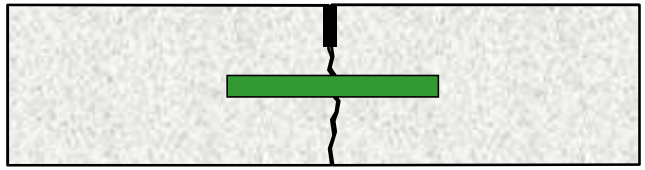
- Construction joints are used between separate concrete placements, typically along placement lane edges.
- Butt joints are recommended for most parking lots where load transfer needs are minimal.



Design Elements – Dowels



Dowels provide load transfer and allow the joints to move



ACI 330 Section 3.8.2

Generally not used in low volume situations. May be needed when there is poor subgrade and/or many trucks.

From American Concrete Institute Committee 330R-08

Step 1: Determine concrete compressive strength requirement. 4000 is recommended.

Step 2: Determine Modulus of Subgrade Reactivity, *k*. Use guidelines below.

Step 3: Determine Traffic Categories (Car parking area, entrances, etc.).

Step 4: Determine *Average Daily Truck Traffic* (ADTT) on the pavement. It is safe to always assume at least one ADTT.

Step 5: Read across row that corresponds to your Traffic Category and ADTT to the column that represents your concrete strength and *k* value.

Minimum Thickness Recommendation:
- Light weight vehicular parking area = 4.5 inches
- Heavy/ industrial parking area = 6.0 inches

Example:
- Car parking area truck access lane.
- Traffic Category A, ADTT = 1.
- Concrete strength of 4000 psi.
- Soil is sands & sand-gravel mixtures relatively free of plastic fines; *k* value is 180–220; therefore use *k* = 200.
- Under area with *k* = 200, read across row with "Traffic Category A (ADTT = 1)" to column under *f'c* = 4000.
- Thickness necessary is 4.0; Minimum is 4.5.

Modulus of Subgrade Reaction

Type of Subgrade Soil	k Value	LBR
Fine-grained soils in which silt and clay-sized particles predominate	75 - 120	3 - 3.5
Sands and sand-gravel mixtures with moderate amounts of silt and clay	130 - 170	5.5 - 9.5
Sands and sand-gravel mixtures relatively free of plastic fines	180 - 220	10 - 15
Cement treated subbase	250 - 500	22 - 62

Traffic Categories

Select Category A, B, C or D.

Car Parking Areas & Access Lanes *(Autos, pick-ups, and panel trucks only)*	Category **A**
Shopping Center Entrance and Service Lanes	Category **B**
City & School Bus Parking Areas:	
◇ Parking area and interior lanes.	Category **B**
◇ Entrance and exterior lanes.	Category **C**
Truck Parking Areas:	
Parking Areas & Interior Lanes — Single-Unit Trucks*	Category **B**
Parking Areas & Interior Lanes — Multiple-Unit Trucks**	Category **C**
Entrance & Exterior Lanes — Single-Unit Trucks*	Category **C**
Entrance & Exterior Lanes — Multiple-Unit Trucks**	Category **D**

* *Single-Unit Trucks = Bobtailed Trucks*
** *Multiple-Unit Trucks = Tractor-trailer units with 1 or more trailers*

Twenty-Year Design Thickness Recommendations in Inches (No Dowels)

		k = 500 psi/in. (LBR = 62; *R* =86)				*k* = 400 psi/in. (LBR = 48; *R* =80)				*k* = 300 psi/in. (LBR = 31; *R* =67)			
	f'c	4500	4000	3500	3000	4500	4000	3500	3000	4500	4000	3500	3000
	MOR, psi	650	600	550	500	650	600	550	500	650	600	550	500
Traffic Category*	A (ADTT=1)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5
	A (ADTT=10)	4.0	4.0	4.0	4.5	4.0	4.0	4.5	4.5	4.0	4.5	4.5	4.5
	B (ADTT=25)	4.0	4.5	4.5	5.0	4.5	4.5	5.0	5.5	4.5	4.5	5.0	5.5
	B (ADTT=300)	5.0	5.0	5.5	5.5	5.0	5.0	5.5	5.5	5.0	5.5	5.5	6.0
	C (ADTT=100)	5.0	5.0	5.5	5.5	5.0	5.5	5.5	6.0	5.5	5.5	6.0	6.0
	C (ADTT=300)	5.0	5.5	5.5	6.0	5.5	5.5	6.0	6.0	5.5	6.0	6.0	6.5
	C (ADTT=700)	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.5	5.5	6.0	6.5	6.5
	D (ADTT=700)†	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5

		k = 200 psi/in. (LBR = 12.5; *R* =48)				*k* = 100 psi/in. (LBR = 3.7; *R* =18)				*k* = 50 psi/in. (LBR = 2.5; *R* =5)			
	f'c	4500	4000	3500	3000	4500	4000	3500	3000	4500	4000	3500	3000
	MOR, psi	650	600	550	500	650	600	550	500	650	600	550	500
Traffic Category*	A (ADTT=1)	4.0	4.0	4.0	4.5	4.0	4.5	4.5	5.0	4.5	5.0	5.0	5.5
	A (ADTT=10)	4.5	4.5	5.0	5.0	4.5	5.0	5.0	5.5	5.0	5.5	5.5	6.0
	B (ADTT=25)	5.0	5.0	5.5	6.0	5.5	5.5	6.0	6.0	6.0	6.0	6.5	7.0
	B (ADTT=300)	5.5	5.5	6.0	6.5	6.0	6.0	6.5	7.0	6.5	7.0	7.0	7.5
	C (ADTT=100)	5.5	6.0	6.0	6.5	6.0	6.5	6.5	7.0	6.5	7.0	7.5	7.5
	C (ADTT=300)	6.0	6.0	6.5	6.5	6.5	6.5	7.0	7.5	7.0	7.5	7.5	8.0
	C (ADTT=700)	6.0	6.5	6.5	7.0	6.5	7.0	7.0	7.5	7.0	7.5	8.0	8.5
	D (ADTT=700)†	7.0	7.0	7.0	7.0	8.0	8.0	8.0	8.0	9.0	9.0	9.0	9.0

* ADTT = Average Daily Truck Traffic. Trucks are defined as vehicles with at least 6 wheels; excludes panel trucks, pickup trucks, and other 4-wheeled vehicles. Refer to Appendix A.
k = Modulus of subgrade reaction; CBR = California Bearing Ratio; *R* = Resistance value; and MOR = Modulus Of Rupture.

† Thickness of Category D (only) can be reduced by 1.0 in. (25 mm) if dowels are used at all transverse joints (that is, joints located perpendicular to direction of traffic). Note: 1 in. = 25.4 mm; 1 psi = 0.0069 MPa; and 1 psi/in. = 0.27 MPa/m.

FLORIDA CONCRETE & PRODUCTS ASSOCIATION, INC.

FAQ

Concrete Parking Lot Design & Construction Specifications

The intent of this document is to address, through references to industry publications and expertise, common design questions and issues that arise during the course of designing and constructing concrete parking lots.

Reinforcement

We've always used Welded Wire Mesh (WWM) and you are telling us not to. What gives? Welded wire mesh provides no increase in pavement structural capacity as some mistakenly believe. The job of WWM is to keep cracks tight that may form from environmental or traffic loading stresses. To keep cracks tight, the mesh has to be put in the correct place, which is rarely done. Below are references citing more explanations:

1. **ACI 330R-08** "When pavement is jointed to form short panel lengths that will minimize intermediate cracking, distributed steel reinforcing is not necessary. The practice of adding distributed steel to increase panel lengths has largely been discredited, and generally leads to excessive joint movements and interior panel cracks that deteriorate over time."
2. **ACPA (RT3.01)** (http://www.concreteparking.org/downloads/RT3.01.pdf) "If the pavement is jointed to form relatively short panels that will control cracking, distribute steel is not necessary. This design is called plain or non-reinforced concrete. For light traffic situations, load transfer is provided by aggregate interlock – the roughness of the cracked faces beneath the joint."

Welded Wire Mesh Is no longer recommended!

FLORIDA CONCRETE & PRODUCTS ASSOCIATION, INC.

Use Certified Finishers

- ACI Flatwork Finisher
- Certified Pervious Concrete Installer
- Quality Team (Experienced)
- Proper Equipment
- Trained Through FC&PA, NRMCA, ACI

Free Design Assistance

PavementDesigner.org

DESIGN SUMMARY REPORT FOR

CONCRETE PARKING LOT

DATE CREATED:

Wed Sep 25 2019 16:59:37 GMT-0400 (Eastern Daylight Time)

Project Description

Project Name: Concrete Paving- TP 4 **Owner:** **Zip Code:**

Designer's Name: **Route:**

Project Description:

Design Summary

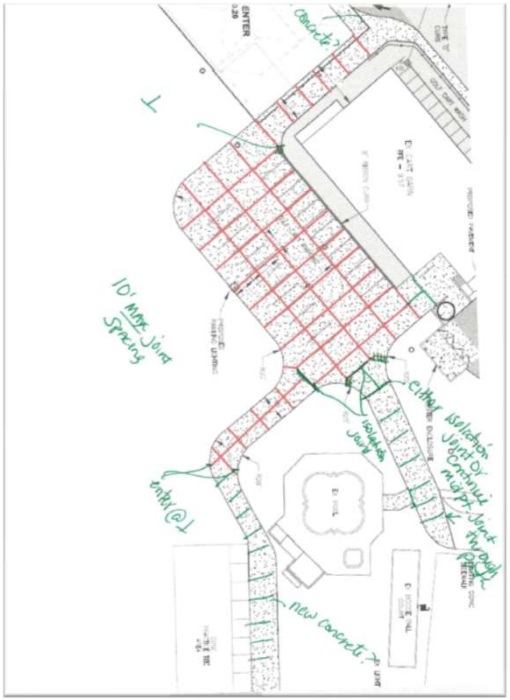
	Undoweled		Undoweled
Recommended Design Thickness:	6.00 in.	Maximum Joint Spacing:	13 ft.
Calculated Minimum Thickness:	5.91 in.		

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 100 psi/in

Layer Type	Resilient Modulus	Layer Thickness
PARKING CONCRETE SURFACE		
SUBGRADE		



Concrete Paving Applications

Pervious Concrete

Roller Compacted Concrete RCC

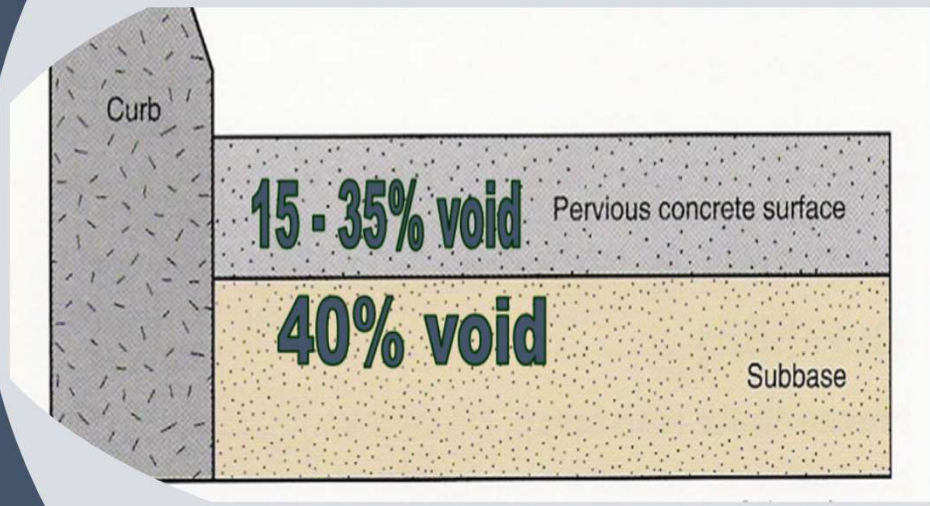
Concrete Overlays

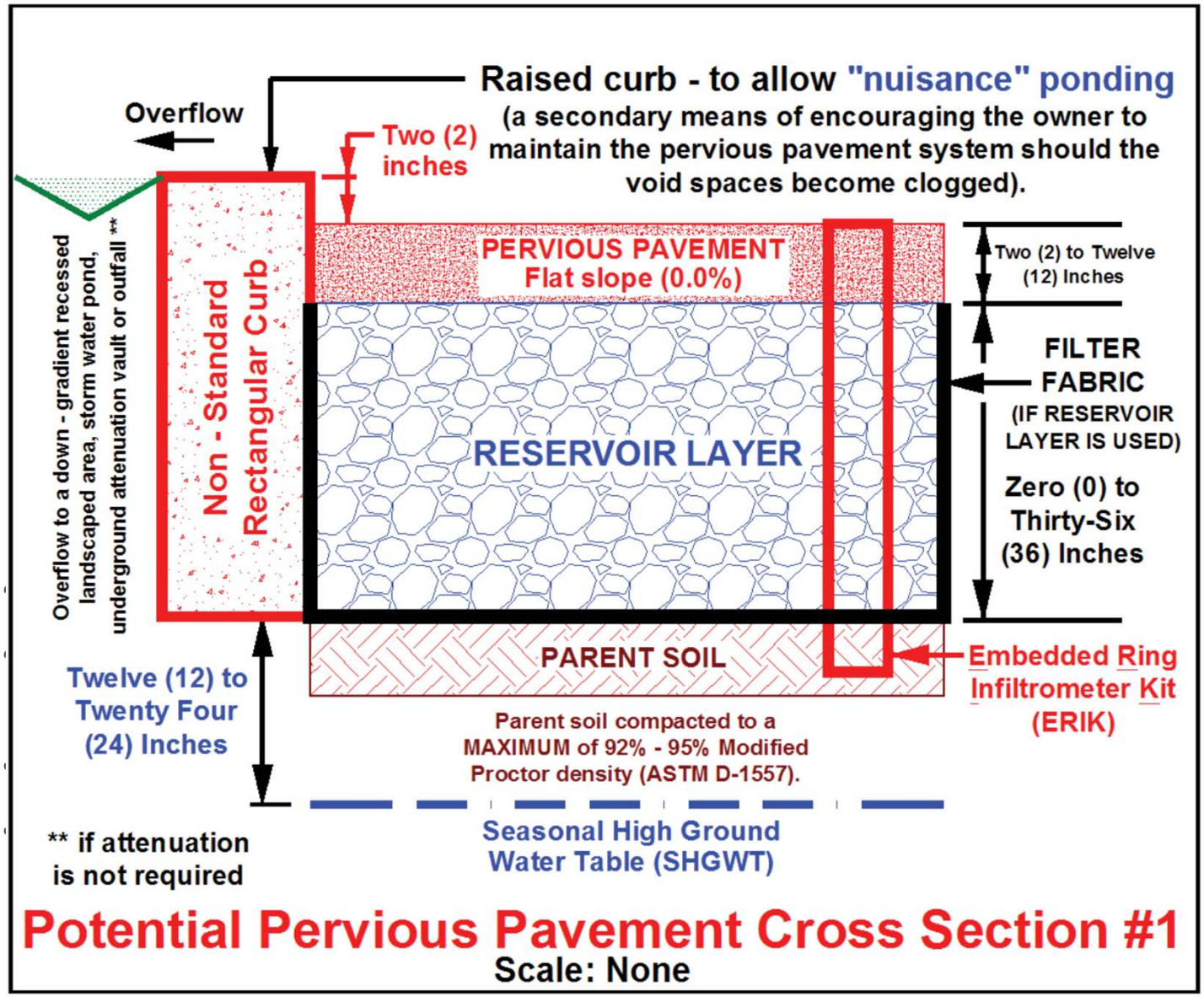
Pervious Concrete

- Stormwater management
  - Quality & Quantity control
- Certified contractors
- Drainage rate = 3-5 gal/min/ft2
- Equivalent of 275” to 450” of rain per hour!

Pervious concrete properties

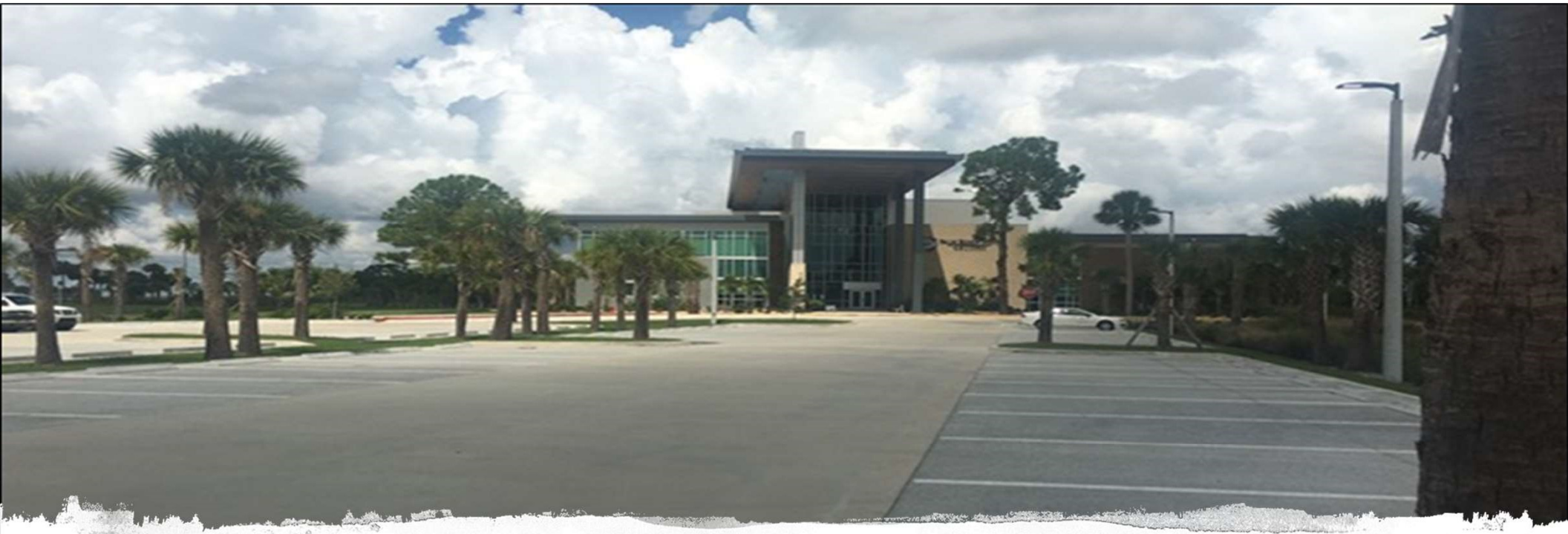
- Pervious concrete: 6 inches typical
- Open-graded stone subbase: determined by local hydrologic conditions
- Geotex prevents movement of fines into stone bed





Potential Pervious Pavement Cross Section #1

Scale: None



Palm Beach State College
Loxahatchee Groves Campus

November 6, 2019

PAVE AHEAD

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Paving Projects | Meet the Experts | Resources | Videos | Design Center

RESOURCES

Concrete Overlays

- CP Tech Center Guide to Concrete Overlays for Streets and Roads
- CP Tech Center Guide to Concrete Overlays for Asphalt Parking Lots
- Concrete Overlays: A new lease on life for old, damaged pavement
- Concrete Overlays: Pinehurst Country Club
- verlays: Glenlake Middle School
- verlays: Armar Plaza
- Concrete Overlays: Brookshire Park

Concrete Parking

ps://paveahead.com/resources/

ete Parking Areas: Best Practices for Engineered Quality a

Paveahead.com

RCC roller compacted concrete

- Speed of Construction
- Durability
- Low Maintenance
- Cost effective solution for heavy duty traffic areas

- Lowe's Distribution Center – 7" RCC was selected in lieu of asphalt by the owner based on pricing and performance expectations. The RCC was placed in 30-foot pavement lanes with control joints cut longitudinally and transversely at 15 feet.
- Project Description: Distribution Facility
- Project Size: Over 3 Million SF
- Project Duration: 2.5 Months

Richland Ave (US 78)
Aiken, SC - 2009

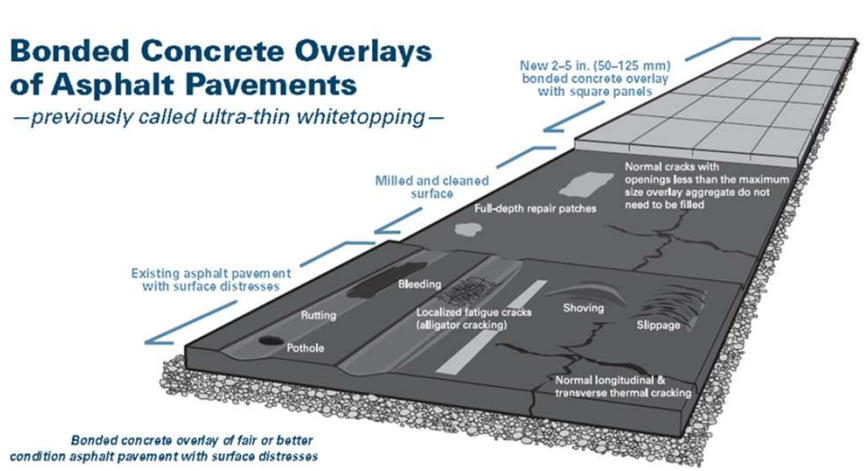
Pavement Design Information	• Owner: South Carolina DOT • Use Type: US Highway • Year Built: 2009 • Thickness: Milled 10” asphalt Placed 10” RCC • Traffic: 6000 ADT, 4 lanes • Speed: 45 mph
Additional Details	• Replaced 27,500 SY in 15 days • Placed 10” RCC in 1 lift • All milled areas were paved within same day • Maintained 1 lane open in each direction • Transverse Joints : 20 ft, early entry saw cut within 3 hours • Traffic re-opened within 24 hours

Concrete Overlays

- Concrete overlay (3” - 7”) on existing asphalt surface
- Existing asphalt serves as compacted base for concrete pavement
- Cost effective
- Durable (30 years 2018 FDOT)

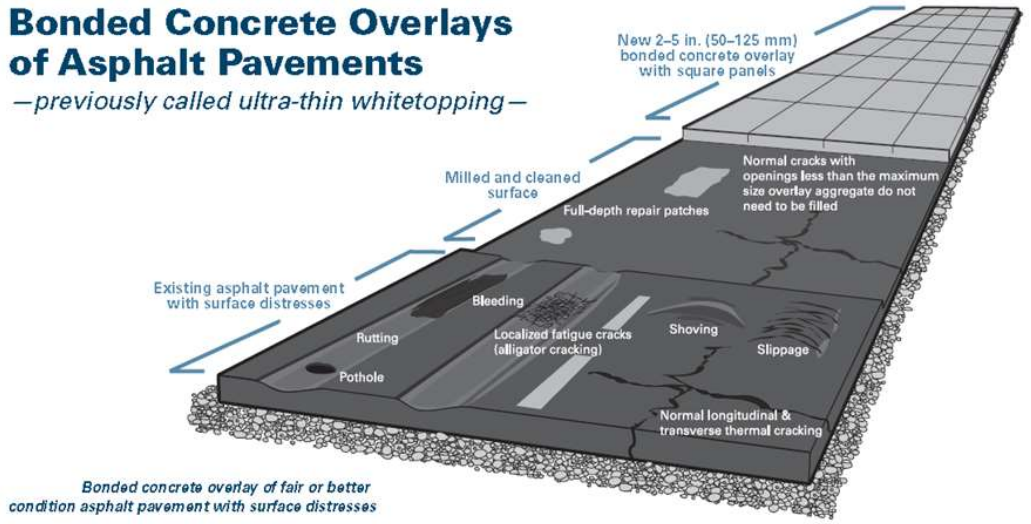
Why Concrete Overlays?

- Concrete overlays are a method to *resurface* existing asphalt paving-and then some:
  - Renew the wear surface-black to white
  - Increase the load carrying capacity of the pavement
  - Improve lighting-reduce heat island
  - Eliminate perpetual asphalt maintenance
  - To give owners a *choice*



Concrete Overlays:

New life for existing *parking lots* without reconstruction



Project Profile

Scope of Work:

•28 year old asphalt parking lot with one overlay and numerous patch and sealcoat
•3” concrete overlay

Design Factors:

•Asphalt alligator cracks with spot repair during it’s life
•Car and light truck traffic

Concrete:

•4000 PSI
•No fibers

Placement:

•Truss screed
•4’x4’ joint spacing–early entry saw with narrow blade
•Full coverage white curing compound

Grimm Chevrolet
Morton, IL
Constructed: 2008

Always Specify Concrete
Spurs Competition

Providing designs for at least 2 pavement types introduces competition.


ECONO LAUNDRY
Imperial Cuts
BARBER SHOP
Don’t let this happen to you!

Questions?

Amy Wedel, Director of Concrete Pavements
awedel@fcpa.org
954.540.4605
www.fcpa.org

Thank you!