



**ACI WEB SESSIONS**



**Christopher Tull.** Christopher R. Tull, P.E., LEED AP After obtaining his Bachelor of Science in Civil Engineering from Cornell University in 1987, Chris began working in the construction industry. Early in his career Chris worked for a large concrete contractor, a construction manager and the Indiana Ready Mix Concrete Association. Chris spent eleven years working for a ready mix producer as Vice President of Production and Quality. Chris started CRT Concrete Consulting in February of 2007 and specializes in a relationship approach to technical issues. Chris has been married to Denise since 1990. They have two children: thirteen year old son, Griffin, and eleven year old daughter Gretchen.



### USE OF ROLLER COMPACTED CONCRETE ON LOW VOLUME ROADS.



March 19, 2012




## Agenda

- What's Changed?
- How Are These Projects Being Developed?
- Issues.
- Project Review.



## What's Changed?

- Ready mix producers are largely interested.
  - Business elsewhere is terrible
  - Asphalt is about \$40/ton (\$80/cy) without trucking is not bad.
  - Local agencies are now requesting RCC



## What's Changed?

- Maximum size of the coarse aggregate has dropped from 1" to about 5/8"
  - Less openness of the surface
  - More aesthetically pleasing





### What's Changed?

- Twin shaft mixers are being used.



### What's Changed?

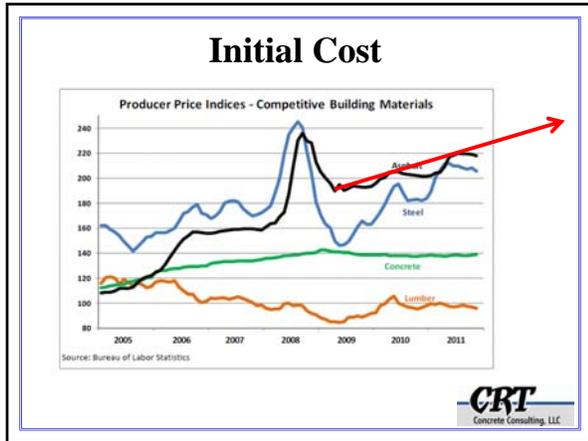
- High density pavers are more prevalent.
  - Better aesthetics
  - Less roller marks



### How Are Projects Being Developed?

- Very few (none?) are designed in RCC.
- Most are designed in asphalt.
- Projects are being flipped over to RCC.





March 22, 2011

Mr. [Name]  
[Address]  
[City, State, Zip]  
[Phone]  
[Email]

Re: [Project Name]

Dear Sir:

Thank you for the opportunity to participate in your ongoing research (RCC) for the above mentioned project. We appreciate your interest in our company and the opportunity to provide our services to your project. We are pleased to provide the information requested and we look forward to working with you on your project. We are confident that our services will meet your needs and we are committed to providing the highest quality of service to our clients.

In your report, various groups have outlined the long term benefits of concrete and related RCC for your project. We are pleased to provide our services to your project. We are confident that our services will meet your needs and we are committed to providing the highest quality of service to our clients.

It is our understanding that the owner is interested in wider roller compacted concrete or roller compacted concrete with aggregate surface. In order to develop such a concrete system, we need the appropriate test and approval concrete system.

Approximating the weight of concrete, we need to know the weight of concrete. Approximate weight (pounds) is given in Table 1. Table 1 shows the weight of concrete. Approximate weight (pounds) is given in Table 1. Table 1 shows the weight of concrete. Approximate weight (pounds) is given in Table 1. Table 1 shows the weight of concrete.

Christopher R. Thal, P.E.  
Owner  
7511 Parkway Drive  
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	Layer	Light	Heavy
Surface	0.50	0.75	1.2
Subbase	0.50	0.75	1.2
Base	0.50	0.75	1.2
Subgrade	0.50	0.75	1.2
Total Weight	1.50	2.25	3.60
Structure Number	0.01	0.01	0.01
Equivalent Concrete	0.50	0.50	0.50

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### Thickness Design of a Roller-Compacted Concrete Composite Pavement System

Table 1. Material Properties and RAL Characteristics

Property	Value	Units
Concrete Strength	4000	psi
Concrete Modulus	4.0	10 <sup>6</sup> psi
Concrete Shrinkage	0.0005	in/in
Concrete Expansion	0.0005	in/in
Concrete Temperature	70	F
Concrete Moisture	100	%
Concrete Density	145	pcf
Concrete Unit Weight	145	pcf
Concrete Slump	10	in
Concrete Air Content	4	%
Concrete Water-Cement Ratio	0.45	-
Concrete Cement Content	10	pcf
Concrete Aggregate Content	135	pcf
Concrete Total Content	145	pcf

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### ISSUES

Table 1. Traffic Statistics

Direction	ADT	ADTT	ADTT	ADTT
North	1000	1000	1000	1000
South	1000	1000	1000	1000
East	1000	1000	1000	1000
West	1000	1000	1000	1000

Table 2. Material Properties and RAL Characteristics

Property	Value	Units
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### Fresh Joints



### Quality Control

- Changing mixture (aggregates) and not getting a new mixture.
- Verifying compaction in the field.
- Verifying strength in the field.



## DAVIESS COUNTY



### 350N from 450E to 575E



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### Twin Shaft Mixer on Dry Batch Plant



### High Density Paver



### Curing



### Surface Texture



## SHEPPARD COMMUNITY CENTER PARKING



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### Beginning



### Mixture



High Density Paver



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Rolling



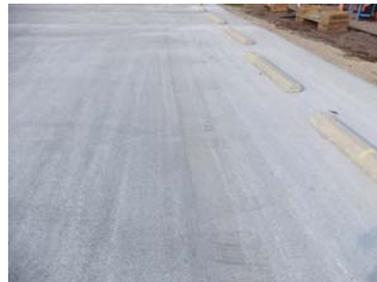
**CRT**  
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Roll Down



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Open



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QUESTIONS?

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