

Paving a NASCAR Speedway

Good for a Racetrack, Good for a Highway?

2007 Southeastern Asphalt User/Producer Group



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Design Concerns

- Racetracks are about entertainment. What might be a small problem on a highway would be a disaster if it delayed a race
- Smoothness
- Durability
 - Resistance to raveling
 - Resistance to shoving
 - Resistance to cracking
- Uniformity (texture etc.)
- Drainage



Fan Excitement

- A performance specification for a NASCAR racetrack would provide for “fan excitement”
- Side-by-side racing, a function of:
 - Geometry
 - Surface friction



What Does it Take to Pave a Track?

- A Team
 - Owner
 - Contractor(s)
 - Engineer(s)
 - Consultant(s)
- A Plan
 - Design build
 - Conventional specifications



What's a typical track life span?



History – Talladega Superspeedway

- Construction of Alabama International Motor Speedway began in May 1968 by Moss-Thornton Construction of Birmingham, AL
- First race September 1969
- Resurfaced immediately after first race
- Overlaid in 1979 by Ashland-Warren Company, Alabama Division
- Reconstructed in 2006 by Sunmount Corporation of Justin, TX

A perpetual racetrack?



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Talladega Superspeedway



- 2.66 mile tri-oval
- 33 degree maximum banking
- 48-foot wide lanes plus 12-foot wide truck lane
- Bill Elliot set record speed of 212.8 mph in 1987

Courtesy of International Motorsports Hall of Fame



Construction 1968



Courtesy of International Motorsports Hall of Fame



Repaving 1979



11th Annual Winston 500 Program – Courtesy of Vicki Adams



Demolition

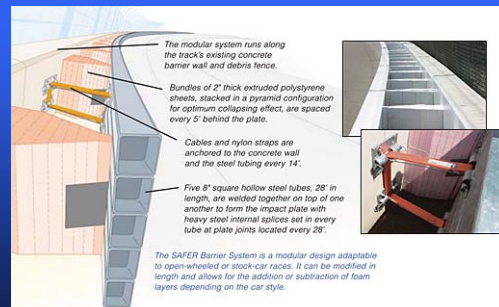


Typical Demolition

- Take down all SAFER™ wall
- Take down catch fence if banking exceeds 24 degrees
- Remove asphalt and base if reconstructing
- Mill
- Inspect for scabs or weak spots
- Clean surface!



What is SAFER™ Wall?



Courtesy of Elrod Corporation – Developed by University of Nebraska - Lincoln

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Demolition



Courtesy of Talladega Superspeedway

Begin Reconstruction

- What happens to the RAP?
 - We have not used RAP in track mix to date
 - Often used to strengthen roads around track for construction
 - Also used to build new roads for RV's and parking on grounds
- Survey
- Grade
- Survey
- Install cement treated base
- Survey
- Grade as necessary



GPS grade control

Grading



Courtesy of Talladega Superspeedway



Place CTB



Courtesy of Talladega Superspeedway

Scabs



Weak Spots



Drainage, Drainage, Drainage

- Drainage is important to the long-term performance of a track
- Some tracks are built in natural bowls, most tracks have paving behind the crash wall
- Edge drains used to intercept water from behind the wall and at the toe of the slope
- Drainage layer can be used to keep water from percolating through the surface of the track



Poor Drainage?



Materials



Surface Mix Design

- Stiff Binder
 - PG 82-XX – XX depends on climate
 - 180 °F Softening Point
 - Elastic Recovery – ensure polymer modification
 - Warm mix additive has been used (mix placed hot)
- 9.5 mm NMAS Surface
 - Polish resistant aggregate
 - 75 Blow Marshall
 - Gradation close to maximum density line
 - Good in-place density!



Test Sections Required



Begin Paving

- Place base course, if used, generally placed from the bottom of the track up – string line
- Place leveling course from top (crash wall) down – string line
- Place surface from top down – use ski
- Number of passes depends on geometry
 - Want to minimize longitudinal joints
 - More passes may be needed to minimize grade change at hinge points
- Check smoothness after each lift
- Grind or precision mill as necessary



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Plant on Site or Close By



Mix Generally Has to be Hauled Through Tunnel as Paving Progresses



Getting Mix to the Paver



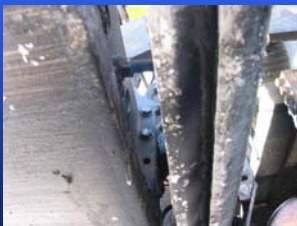
Slat
Conveyor

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Tamping Bar Screed Paver



- Can obtain up to 90% G_{mm} directly behind screed
- Minimizes roll down – 1/8 inch per inch instead of typical 1/4 inch per inch

Smoothness

- Grade Control – 3 dimensions in curves
- CTB, Base and Leveling placed with string lines
- Surface placed with paver on automatic
 - Ski with bridge to new mat
 - Tamping bar screed – minimizes roll down
 - Stable mix

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Longitudinal Joints

- A weak point in a racetrack pavement as well as a highway pavement
- Options
 - Paving in echelon - generally not possible on ovals
 - Stager joints between lifts
 - Cut back joints
 - Saw
 - Cutting wheel
 - Joint sealant



Paving in Echelon – A lot of Equipment



Paving in Echelon



Cut Back Joint



Rolling 6 in. off the joint – Maybe not such a good idea



Compaction



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18 – 24 degrees – Support from below



> 24 degrees, suspend from above



Compaction Against Wall



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Like on a highway, you need a roller operator who can take direction, and do the same pattern all day long!



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If it wasn't right, it was removed



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Density Measurement

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QC



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Density on Base And Leveling Determined with cores



QA Density

Talladega Nuclear Gauge
Avg. Mat = 94.2%
Avg. Joint = 92.1%



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Attention to Detail



The End Result



NCAT Team ('06)



What Do You Need to Pave a Racetrack?

- A good team
- Dedication
- Communication



Thanks!

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