

Purdue Road School 2012

Reducing Your Cost for Asphalt Pavements

Asphalt Pavements at Less Cost

Reduce your Asphalt Pavement costs by:

- Specifications
- Pay Item Selection
- Placement Savings Opportunities
- Pavement Savings Opportunities

Asphalt Pavement Specifications

- Specifications
 - INDOT Specification Sections 401 vs. 402
 - Reused Asphalt Pavement
 - Recycled Asphalt Shingles
 - Tear-offs
 - Manufacturer Seconds/Tabs
 - Warm Mix Asphalt

INDOT 401 vs. 402

- Same
 - Mix Designs for same traffic levels
 - Quality of Mix
 - Mix Production Quality Control
 - Desired Pavement Quality
- Difference
 - Acceptance of mix procedures
 - Compaction process and acceptance of density
 - Smoothness of Road acceptance
- 401 Creates much more work and cost for Agency

Same Mix Designs

- Gerry covered the Mix Design process.
- Surface, Intermediate or Base mix for a traffic category is the same for 401 or 402
- An aggregate size mix does not change in mix design for usage as a Surface, Intermediate or Base course for Class A or B mixes.
- Example - A 12.5 mm mix is the same used in any course.

Same Quality of Mix

- 401 and 402 require the same
 - Liquid Binder
 - Aggregate
 - Quality Control at plant
- 402 - Contractor certifies with a Type D certification the mix meets quality specs.
- 401 - Agency must do acceptance testing to accept the mix as meeting quality specs.

Pavement Acceptance

- 401 Specification
 - Density – contractor determines method and equipment, acceptance per compaction tests
 - Smoothness – acceptance per profilograph results
- 402 Specification
 - Density – contractor accomplishes per specified rolling equipment and pattern
 - Smoothness – acceptance per 16' straight edge

Mix Acceptance

- 402 no additional cost to the Agency
- 401 Agency responsibilities:
 - On site to view collection of sample, contractor collects from pavement.
 - Proper transport of sample to not compromise
 - Complete gyratory compaction and ignition oven tests
 - Pay incentive/disincentive payment per test results
 - Additional testing if contractor requests appeal

Pavement Acceptance

- 402 no additional cost to Agency
- 401 Agency responsibilities for Density
 - Witness and take possession of density cores accomplished by contractor
 - Transport cores to protect
 - Density tests
 - Additional tests if contractor appeals results.
 - Pay incentive/disincentive on results

Pavement Acceptance

- 401 - Agency responsible for Pavement Smoothness acceptance testing
 - Less than 45 MPH, straight edge acceptance.
 - Greater than 45 MPH, Profilograph acceptance
 - Agency present for running of profilograph
 - Agency takes profilograph results
 - Agency determines the results per specs
 - Agency pays incentive/disincentive per specs

401 or 402

- Agency receives the same quality of mix with no additional acceptance cost with 402.
- Agency receives specified quality pavement with no additional acceptance cost with 402.
- Agency does not have to budget for incentive/disincentive for 402.

Specification allow RAP/RAS

- Reduce Cost – Reuse/Recycle
 - Reused Asphalt Pavement
 - Recycled Asphalt Shingles
 - Allowed per INDOT specification up to 40% of binder replacement in mix.
 - Quality of mix is not compromised and may be enhanced.
 - Substantially reduces mix cost.

Reused Asphalt Pavement

- Source is milled roads, chunked out pavements and plant run mix
- Crushed to 1/2" minus or 3/4" minus passing
- Quality control is similar to virgin aggregate
- Find std deviation less than virgin aggregate
- Computer metered conveyed into plant
- Valuable as is 5% +/- asphalt @ \$600 = \$30/T, aggregate is about \$12 for \$42 value

Recycled Asphalt Shingles

- Source is Manufactured tabs or seconds or tear-off from residential houses.
- Must be tested for asbestos, but no residential shingles have been made with since early 80s
- Ground to 3/8" minus sieve for proper mixing
- IDEM letter of legitimate usage
- Computer metered conveyed into plant
- Valuable 19% asphalt Manuf; 23% TO

Virgin 9.5 Surface Mix Cost

- 9.5 Aggregate 58% @ \$ 15/T = \$ 8.70
- Sand 20% @ \$ 12/T = \$ 2.40
- Manuf. Sand 15% @ \$ 20/T = \$ 3.00
- RAP 0.0% @ \$ 20/T = \$ 0
- PG 64-22 6.0% @ \$600/T = \$36.00
- TOTAL = \$50.10

RAP 9.5 Surface Mix Cost

- 9.5 Aggregate 38.5% @ \$ 15/T = \$ 5.78
- Sand 20% @ \$ 12/T = \$ 2.40
- Manuf. Sand 0 % @ \$ 20/T = \$ 0.00
- RAP (5%) 30 % @ \$ 20/T = \$ 6.00
- PG 64-22 4.5% @ \$600/T = \$27.00
- TOTAL = \$41.18
- Virgin = \$50.10 Savings = \$ 8.92

RAS 9.5 Surface Mix Cost

- 9.5 Aggregate 58% @ \$ 15/T = \$ 8.70
- Sand 28.5% @ \$ 12/T = \$ 3.42
- Manuf. Sand 0.0% @ \$ 20/T = \$ 0.00
- RAS(fac, 19%) 8.0% @ \$ 38/T = \$ 3.04
- PG 64-22 4.5% @ \$600/T = \$27.00
- TOTAL = \$42.16
- Virgin = \$50.10 Savings = \$ 7.94

RAS 9.5 Surface Mix Cost

- 9.5 Aggregate 58% @ \$ 15/T = \$ 8.70
- Sand 31% @ \$ 12/T = \$ 3.72
- Manuf. Sand 0.0% @ \$ 20/T = \$ 0.00
- RAS(TO, 23%) 6.5% @ \$ 28/T = \$ 1.82
- PG 64-22 4.5% @ \$600/T = \$27.00
- TOTAL = \$41.24
- Virgin = \$50.10 Savings = \$ 8.86

RAP/RAS 9.5 Surface Mix Cost

- 9.5 Aggregate 40% @ \$ 15/T = \$ 6.00
- Sand 36.5% @ \$ 12/T = \$ 4.38
- Manuf. Sand 0.0% @ \$ 20/T = \$ 0.00
- RAP (5%) 15.0% @ \$ 20/T = \$ 3.00
- RAS (fac, 19%) 4.0% @ \$ 38/T = \$ 1.52
- PG 64-22 4.5% @ \$600/T = \$27.00
- TOTAL = \$41.90
- Virgin = \$50.10 Savings = \$ 8.20

RAP 9.5 Surface Mix Cost

- 9.5 Aggregate 30.0% @ \$ 15/T = \$ 4.50
- Sand 18.4% @ \$ 12/T = \$ 2.21
- Manuf. Sand 0.0% @ \$ 20/T = \$ 0.00
- RAP (5%) 48.0% @ \$ 20/T = \$ 9.60
- PG 58-28 3.6% @ \$650/T = \$23.40
- TOTAL = \$39.70
- Virgin = \$50.10 Savings = \$10.39

9.5 Surface Mix Cost Summary

- Virgin material cost \$50.10
- 25 % Binder Replacement
 - RAP - \$ 8.92
 - RAS, Factory - \$ 7.94
 - RAS, Tear-Offs - \$ 8.86
 - RAP/RAS (Factory) - \$ 8.20
- 40 % Binder Replacement
 - RAP - \$10.39

19.0mm Open Graded Mix Cost

- 19.0 Aggregate 86.0% @ \$ 15/T = \$12.90
- Sand 10.9% @ \$ 12/T = \$ 1.31
- RAS(TO, 23%) 0.0% @ \$ 28/T = \$ 0.00
- PG 76-22 3.1% @ \$740/T = \$22.94
- TOTAL = \$37.15

19.0mm RAS Open Graded Mix Cost

- 19.0 Aggregate 84.0% @ \$ 15/T = \$12.60
- Sand 10.2% @ \$ 12/T = \$ 1.22
- RAS(TO, 23%) 3.5% @ \$ 28/T = \$ 0.98
- PG 70-22 2.3% @ \$640/T = \$14.72
- TOTAL = \$29.52
- Virgin = \$37.15 Savings = \$ 7.63

Warm Mix Asphalt

- INDOT no longer has WMA as a special mix.
- INDOT maximum mix temperature is 320 F
- INDOT has no lower temperature requirement
- INDOT allows water foaming of asphalt binder by water injection method for all mixes.
- Realizes a savings of about 15% to 25% of fuel usage, about \$0.75 per ton

Pay Item Selection

- HMA vs. QC/QA
 - HMA is 402 Specification
 - QC/QA is 401 Specification
 - HMA items are less cost to Agency at same quality
- Tack - Have as a separate item
 - Tack decreases surface problems and increases life
 - Tack improves longitudinal joint properly applied
 - Well worth the cost and quantity used

Placing Savings Opportunities

- Full-Width Paving
 - Improved production, reduces costs
 - Eliminate centerline joint, future maintenance
 - Haul trucks stay in center of road, edge issues
- Safety Edge
 - Safe edge for traffic, creates a 30 degree edge
 - Shoulder material placement stays or not placed

Pavement Savings Opportunities

- What are you trying to accomplish?
 - Protect existing good pavement, improve surface
 - 4.75mm Surface Overlay w/wo profile milling
 - Improve ride, rid surface cracks seal
 - Milling – profile or 1.5” depth
 - Overlay with 1.5” or 2” 9.5 or 12.5 Overlay
 - Improve strength
 - Profile mill or wedge and level to level existing
 - Place leveling or intermediate course and surface