Asphalt Use for Sports Courts, Trails and Other Non-Traditional Applications

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Asphalt Pavement Alliance

Seek first assistance, support from your SAPA, then APA... Deploy effective resources directly to marketplace Strengthen fact focused relationships between decisionmakers, owners, agencies, and contractors 3 pillars = innovation, collaboration, and education Technical competence and trust with community Support and promote quality asphalt pavement!



Why?

Increasing popularity of sport courts and trails Asphalt is the preferred sport/trail surface in the US Orthopedic benefits from reduced stress on joints Excellent adhesion/longevity for many color coatings

Proven weather resilience (hot vs cold, dry vs wet) Durable, economical, easy for owners to maintain How to bid, build projects that meet expectations?



Credits

Deb Schwerman's past WAPA/APA webinar Tim Murphy's past NAPA sport courts webinar Mike Skinner's past APA bike path's webinar Randy West's past ASBA meeting presentation.

References

ASPHALT PAVEMENT MIX TYPE Selection Guide



Information Series 128

Gradation

Finer Gradations are

More Workable

Less Permeable

Less Texture

MAS 12.5

Permeability

Roadways *≠* Sports

https://sportsbuilders.org/

Sports Facilities Pavements

Surface tolerance and macrotexture are critical Heavy vehicle loading is not the design criteria Resistance to cracking is the primary consideration Materials/mix design must consider differences DOT-approved producer, SAPA member, QC plan Plant, paving crew with project specific experience.

ASBA Mix Design Requirements

Property	Superpave	Marshall	Hveem
Stability (lbs.)	n/a	1,200 min.	30 min.
Flow (0.01 in.)	n/a	8 to 16	n/a
Swell (in.)	n/a	n/a	0.030 mix.
Air Voids @ Opt. Pb		3.5%	
VMA based on NMAS			
#4 (4.75 mm)		16.0 min.	
³₄" (9.5 mm)		15.0 min.	
½" (12.5 mm)		14.0 min.	
¾″ (19.0 mm)		13.0 min	
Voids Filled w/ Asphalt		73 to 80	
Dust to Asphalt Ratio		0.7 to 1.3	
Tensile Strength Ratio		80% min.	

Aggregate Selection

Local sources on state DOT's approved list No deleterious materials (shale, pyrite, clay balls) No Slags (metallic, variable gravity, absorptive) ~50% of mix sand size stockpiles (mostly crushed) ≤20% natural sand content (moisture sensitivity) ≤15% RAP can work (-½", no deleterious or slag).

Other Materials

- **Recycled Asphalt Shingles NO**
- Polymer modified binder not needed
- Ground tire rubber optional
- Fibers not needed (cellulose or aramid)
- Warm Mix Additives recommended
- Antistrip Additives as needed based on TSR
 - Recycled plastics way too early to tell.

Typical Sport Design

Playing Surface – HMA Upper Layer – HMA Lower Layer – Aggregate Base – Subgrade – Subgrade –

Grade Control

Grade Control

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Preventing Cracks

PAVEMENT

Cracking

- Likely initiated by extreme temperature change
- Thermal differential under reflective stripe
- Aging/oxidation differential under surface coatings.

High Temperature PG Grades

Low Temperature PG Grades

Blisters

Moist

Therm

Low te Vapor erneath) rtime) peratures

asphalt

Stains

Bike Paths and Trails

AASHTO Design for pavements, shoulders (drainage) Minimum total asphalt thickness 3 inches (2 lifts) Minimum crushed agg base thickness 6 inches Weeds, shoulder/subgrade failure, roots.

Targeting Macrotexture

https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Takeaways

Planning, plant, paving team sold out on the mission Base preparation (design, construction, grade) Design/produce mixes that are soft, sized for use Select appropriate aggregates, RAP, binder grade Don't neglect quality (AC, gradation, voids, density) Hyper focus on grade control, prevent "bird baths" Sawcut, treat critical locations to prevent cracking Bid/build profitable, successful projects!

Questions?

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