

# ASPHALT GUIDELINE OBSERVATIONS

ASBA Executive Summary on Asphalt

November 2021

## Asphalt for Athletic Facilities

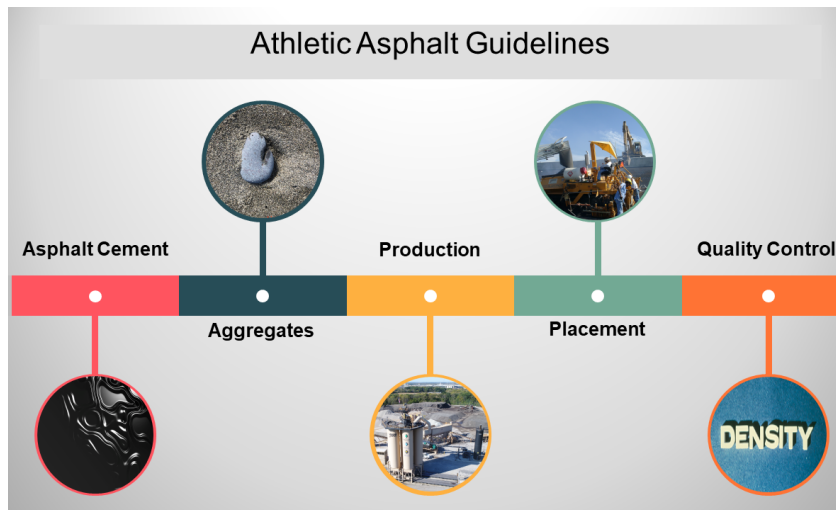
Coatings formulated for horizontal asphalt surfaces occasionally have imperfections. Imperfections such as cracks, blisters, aggregate pop-outs, or delamination are often caused by problems with the underlying asphalt or substrate. The purpose of the asphalt guidelines document is to assist ASBA membership with general and specific strategies that should be followed to help make the use of asphalt for athletic purposes (tennis and pickle courts, running tracks, basketball courts, and multiuse courts) successful. It is important to use the following bullet points as well as the detailed (technical) asphalt guidelines included within. Additionally, reference published guidelines by the ASBA in both the Tennis Courts and Running Tracks Construction and Maintenance Manuals, current edition, specific to athletic asphalt.

### Tips for Successful Installation of Asphalt Athletic Facilities

- Specify and Install asphalt for low volume use; base, leveling, and surface.
- Provide Virgin Asphalt Surface Course Mix Design with:
  1. Maximum particle size of ½” or less
  2. Crushed coarse and fine particles
  3. No aggregates that rust or disintegrate (iron pyrite, steel slag, or impurities)
  4. Minimum of 45% sand portion (minus No. 8 sieve) in surface course mixture
  5. Target laboratory air voids = 3.5%
- Install asphalt surface course to:
  1. Eliminate cold joints
  2. Specified minimum in-place density of mat and joints = 94.0%
  3. Planarity, level, and trueness per ASBA

*Utilizing and ensuring the use of the correct asphalt mix design, production practices, process control testing, and planarity will lead to high quality, compliant asphalt that will not cause athletic coatings or surfaces to fail prematurely.*

*- Timothy R. Murphy, P.E.  
Murphy Pavement Technology, Inc.*

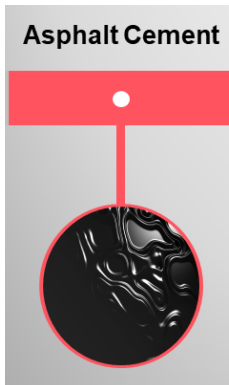


### In The ASBA Guideline

- Qualified Suppliers
- Definitions
- Materials
- Mix Design Requirements
- Testing
- Equipment
- Surface Preparation
- Asphalt Placement
- Compaction Standards
- Quality Control / Assurance

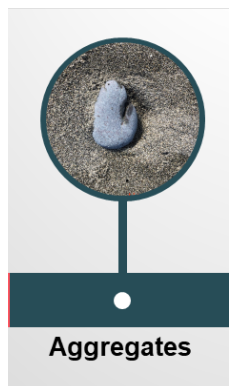
Critical path to successful coating and track surfacing performance.

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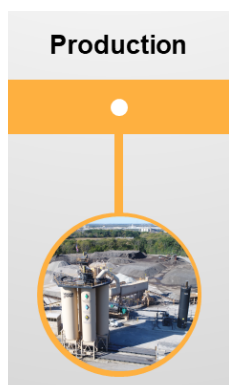
Asphalt cement (AC) has changed over the ages as well as the refining processes and objectives for the oil. Follow agency and Asphalt Institute recommendations for new construction. Performance Graded (PG) and Multi-Stress Creep Recovery (MSCR) are most common methods to ensure highest quality liquid AC. Polymers and anti-strip agents may be required in some instances and should be considered on a case-by-case basis.

Ensure that only state approved liquid asphalt sources and products are used in the asphalt mixture.



Use agency approved virgin aggregates and do not allow the use of iron pyrite, steel slag, or any known soft or unsound particle in surface course. Proper use of recycled asphalt pavement (RAP) should be allowed in base and / or binder course only. Eliminate the use of RAP in the surface course unless documentation can be provided in a notarized format that states all aggregates within the RAP are hard, free of contaminants, won't rust, and are uniform.

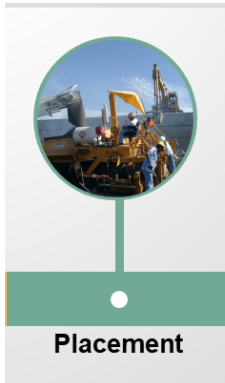
The ASBA guideline recommends no RAP in surface course, however, the architect / engineer has the final say on this matter.



Communicate asphalt needs and wait for appropriate asphalt, often called low volume asphalt mixture. Facility should be state approved and membership in local trade association is preferred. Asphalt shall be uniform, free of moisture and impurities, and easy to work in the field. Surface course is typically ½" top size and fine graded with higher AC than road mix for long term performance.

Make it clear to the supplier and paver that the proper liquid AC, aggregate gradation, volumetrics, and density should achieve the ASBA guidelines.

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Install asphalt level and true with no gouges, tears, or segregation. Paving seams shall be straight, true, and paved hot. Develop a paving plan prior to installation and share with the architect and engineer. Provide asphalt that is hot enough (typically between 280°F - 300°F) to install and compact without crushing aggregates. Ensure in-place density is above 94.0% of the maximum theoretical specific gravity ( $G_{mm}$ ) for mat and all joints. Use rollers that vibrate, oscillate, or knead the asphalt adequately.

Allow asphalt cure time per the coating manufacturer's recommendation.



Verify asphalt content, washed gradation, laboratory volumetrics, and in-place compaction (density) are compliant. Make QC part of the contract documents and review the asphalt producer and installer QC plans prior to paving. Perform sampling and testing with qualified technicians on base, binder, and surface course and follow ASTM or AASHTO test methods.

Density is one of the most crucial measures of the asphalt quality on athletic facilities as well as roadways, runways, and commercial or industrial projects. **For example, you may have an excellent mixture with poor density and a marginal mixture with great density; the marginal mixture will perform exponentially better than the excellent mixture with poor density because poor density equates into a high void asphalt that allows water and air penetration. Water and air penetration will lead to stripping, cracking, internal pressure changes, and rutting quickly.** Many times, a 1% density increase yields a 10% increase to the dynamic modulus,  $E^*$ , and higher tensile and shear strengths.

Every percentage increase to density the asphalt strength increases significantly. Lack of density is a primary reason why athletic coatings fail in service, because it enables moisture infiltration, stripping of AC, and internal pressure changes throughout the year.

*This Guideline is intended to assist owners, contractors, design professionals, and hot mix asphalt suppliers in the design and installation of hot mix asphalt concrete to meet exacting sports construction standards. Because of the wide variation in climate, construction methods, site conditions and materials availability, the services of a qualified and experienced design professional should be obtained before use to ensure suitability for a specific project. The American Sports Builders Association does not represent that this Guideline is suitable for any specific project, disclaims any and all warranties with respect to this Guideline, and assumes no responsibility for the use of this Guideline with respect to any project.*

