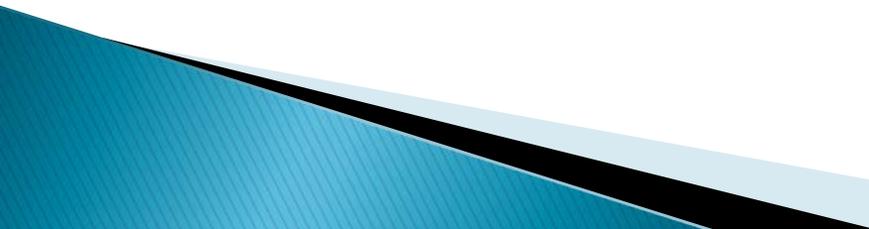


Use of Macadam in Sports and Play Surfaces

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Context

- ▶ Historically most outdoor sports in UK played on natural grass: – football, rugby, cricket, athletics, tennis, netball.
 - ▶ Whilst excellent in many respects, grass needs frequent maintenance, is adversely affected by the weather and is highly variable in terms of performance between dry and wet conditions
 - ▶ Grass also wears relatively quickly, so large number of pitches required, taking up lots of land area
- 

Development of artificial playing surfaces



For increased durability

Allowing extended hours of usage

Less land area required as sports area can be used throughout the day and, with floodlighting, during the evening too

More consistent play characteristics, sometimes allowing higher standard of performance by players.

Has become the only option for some sports

Reduced maintenance costs

Artificial sports surfaces

- ▶ All require a stable form of base construction:
 - ▶ EITHER –Dynamic– compacted graded stone
 - ▶ OR –Engineered –compacted graded stone with macadam top layer(s)
 - ▶ Engineered is usually recommended in UK to suit climate, ground conditions and available materials– with porous macadam for near all weather availability of the playing surface
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Engineered– porous base

Surfaces typically using a porous macadam and stone base :

- ▶ Artificial grass / clay
- ▶ Polymeric– in situ resin bound rubber crumb
- ▶ Preformed porous rubber
- ▶ Other specialised types



And a few other examples of porous surfaces on an engineered base



Artificial sports surfaces– dense base



Indoor cushioned acrylic



Outdoor un-cushioned acrylic

Macadam as the playing surface



With play lines only



Coloured with sports paint

Installation methods

- ▶ Hand laid for smaller areas, particularly where access is limited, higher porosity is required or bay joint layout is critical
 - ▶ Machine laid for larger areas for speed and economy and occasionally where durability is more critical than porosity
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Hand laying



Space to tip– or use
chuted lorry



Spreading and screeding

Hand laying

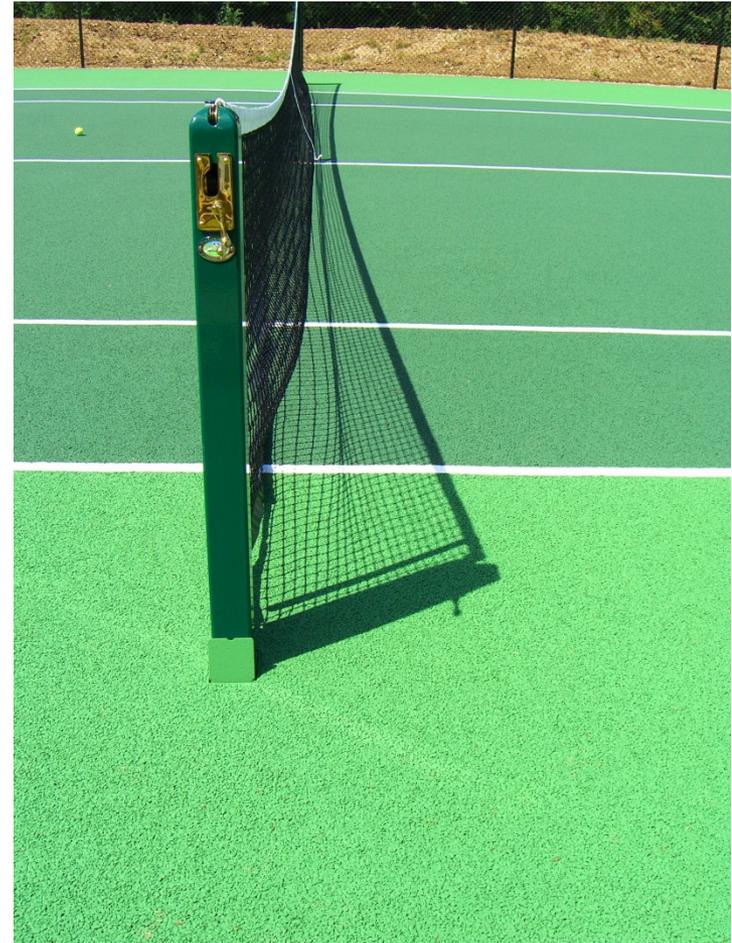


Spreading, screeding
and rolling



Completed surface

Colour spray and play lines once macadam has had time to cure



Performance requirements

Sports surfaces are usually specified on a performance basis rather than to BS or BS EN standards.

Each sport's NGB (National Governing Body) will set minimum standards for its own sport, sometimes with reference to International Governing Body's requirements

But European standards are likely to force changes for some sports

Key properties

Friction:
Slip resistance and / or traction

Energy restitution:
Ball bounce
Force reduction
Surface pace

Topography and dimensions:
Gradient / slope
Planarity
Surface evenness
Play lines & total play area
dimensions

Consistency of performance over
the whole playing area

And where specified porosity



Macadam – occasional problems



Iron pyrites and soft stone in the macadam



Undulations, loss of porosity and cracking– not usual macadam's fault

Stronger mixes for higher loadings– but still needing to be porous



Skate park with roller wheels and impact following jumps



Sports surface with occasional use for overspill car parking

Multi use



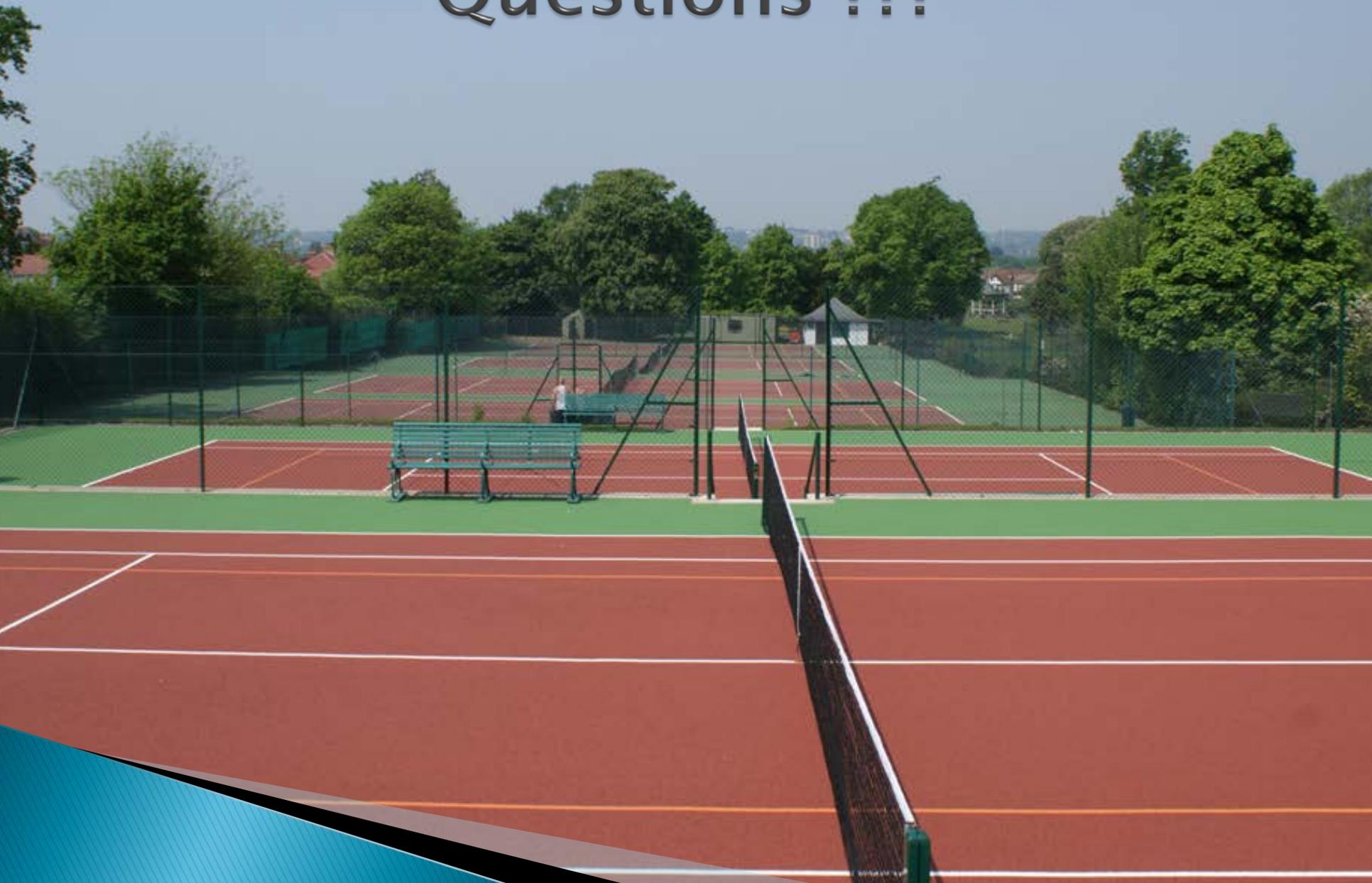
Common at schools where lots of different sports need to be played in a limited amount of space

But need to decide which sport is main usage to select performance requirements

The future

- ▶ Modified or alternative binders allowing self coloured surfaces at more economic costs?
 - ▶ Stronger porous surfaces that are more workable when being laid?
 - ▶ More stable dynamic solutions that may eliminate the need for macadam?
 - ▶ More durable surfaces requiring less frequent resurfacing?
- 

Questions ???



Links:

http://www.sportengland.org/facilities__planning.aspx

<http://www.itftennis.com/technical/facilities/overview.aspx>

<http://www.lta.org.uk/clubs-schools/Resources---facility-guidance/>

http://www.englandnetball.co.uk/make-the-game/Facilities_and_Courts

http://www.sapca.org.uk/page.asp?node=37&sec=Technical_Guidance

<http://www.trevormay.co.uk/>

