



Latest Developments in Skid Resistance, PSV and Synthetic Aggregate

IOQ/AQA Conference – Waitangi

July 2005


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Introduction


- Skid Resistance
- PSV Research
- Natural vs. Synthetic Aggregates
- Ultra High Pressure Watercutter


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Skid Resistance

- Transit New Zealand T/10 Specification
- Equal accident risk throughout the network

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|  <h2 style="text-align: center;">Skid Resistance Targets</h2> | | | |
|--|---|---------------------------|----------------------|
| Site Category | Site Definition | Investigatory Level (SFC) | Threshold Level (TL) |
| 1 | Approaches to railway level crossings, traffic lights, pedestrian crossings, roundabouts, Stop and Give Way controlled intersections (SH only), One Lane Bridges (including bridge deck). | 0.55 | 0.45 |
| 2 | Curve < 250m radius Down gradients > 10% | 0.50 | 0.40 |
| 3 | Approaches to road junctions Down gradients 5-10% Motorway junction including On/Off Ramps | 0.45 | 0.35 |
| 4 | Undivided carriageways (event-free) * | 0.40 | 0.30 |
| 5 | Divided carriageways (event-free) | 0.35 | 0.25 |

* Event-Free = Where no other geometrical constraint or situations requiring sudden braking, influences frictional demand





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Recent Studies

- High accident rate at intersections
- Have to equalise the accident risk
- PSV > 70 required
- Highest PSV in NZ has PSV 65.
- Natural Aggregates not performing
- Have to use synthetic aggregates (Imported?).






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PSV Test Research


- Test synthetic aggregate
- Test small aggregate
- Test blends of aggregates

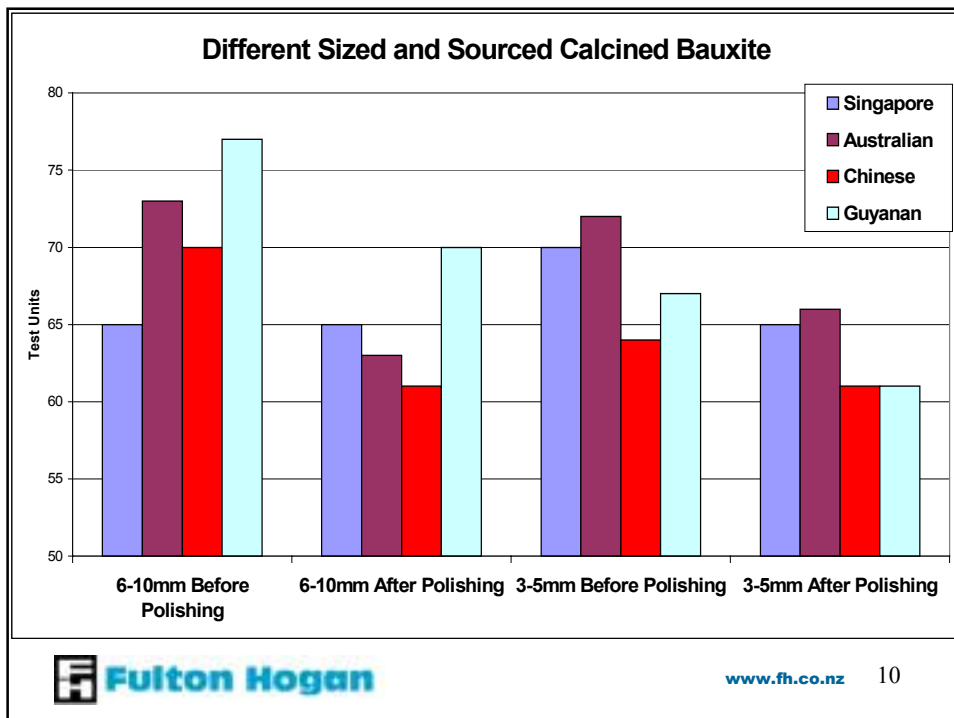
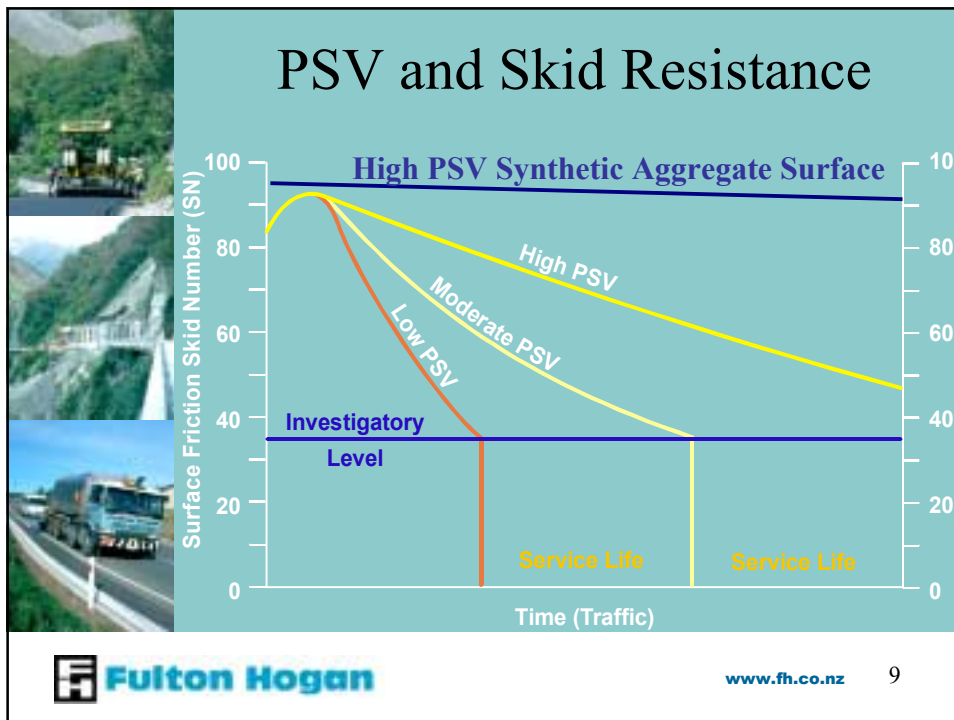




Synthetic Aggregate “PSV”

- PSV test developed to rank natural aggregates.
- NZ use it as a property test
- The test method requires the use of 6-10mm aggregate
- Synthetic Aggregate used in NZ mostly 1-3 and 3-5mm.

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Natural vs. Synthetic Aggregate

- High Friction Surfacing
- Small aggregate “PSV”
- “PSV” of different sized aggregates
- PSV of blends of aggregates




High Friction Surfacing

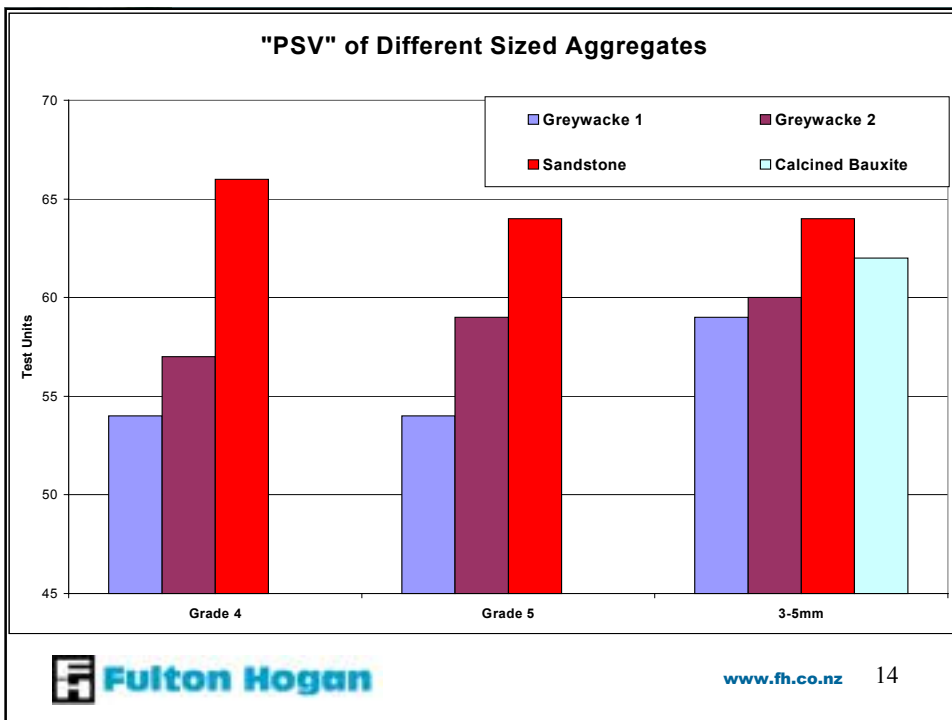
- High Surface Friction for life of surfacing
- Good texture
- Many edges – high hysteretic friction
- Hard durable aggregate – maintains sharp edges
- PSV result not always relevant

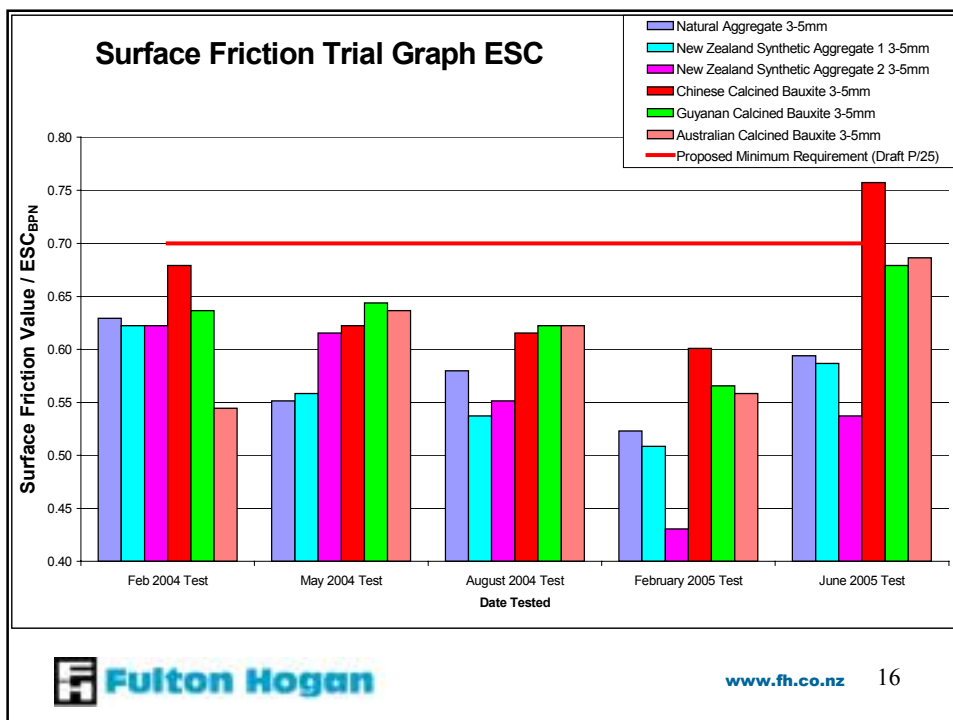
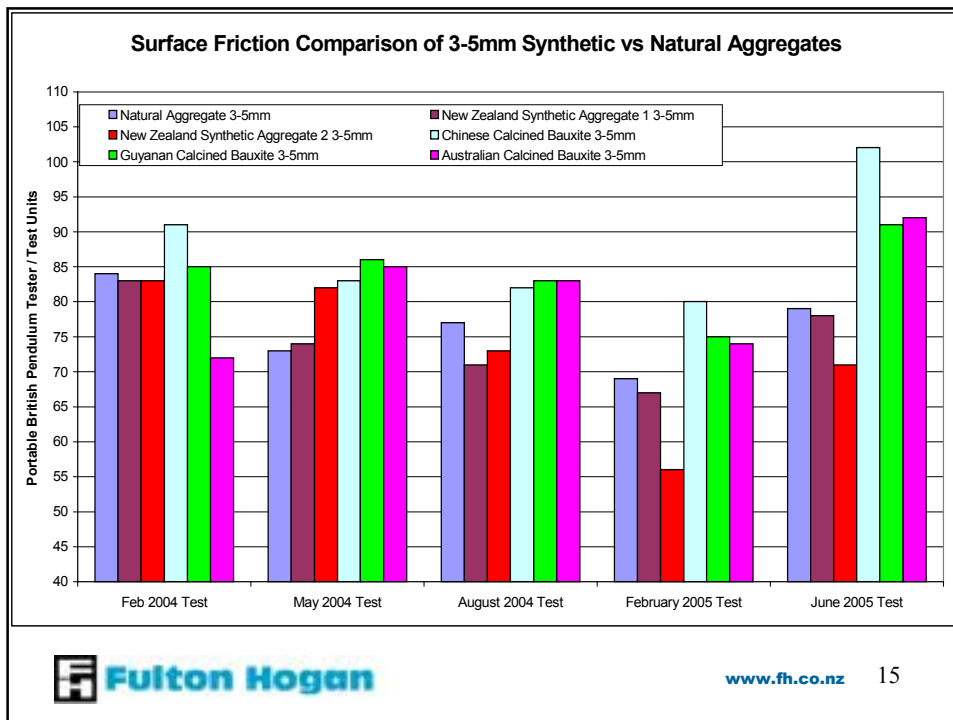


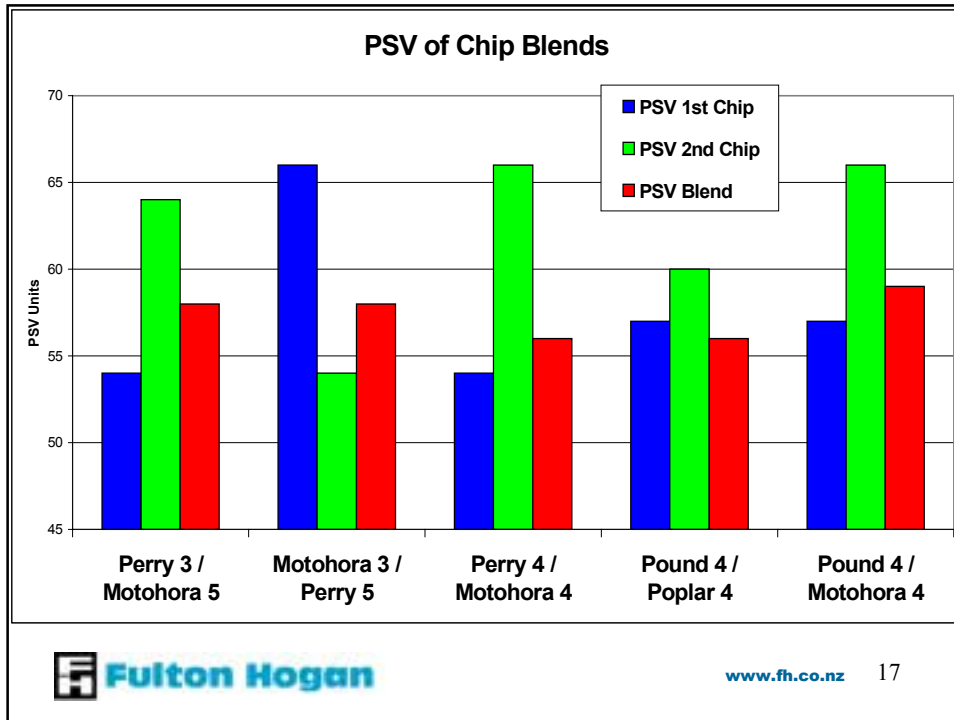
Small Aggregate “PSV”

- Hardwearing durable aggregate
- 3-5mm clean
- Use “PSV” test method as a starting point



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Blends of chip with Different PSV




- The results of one blend were less than for either of the components
- The blend was usually close to the average.
- How do you guarantee an even distribution of both components?



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Ultra High-Pressure Watercutting a Sustainable Surfacing Treatment?


- Flushed Surfaces
- Polished Surfaces
 - Advantages
 - Limitations


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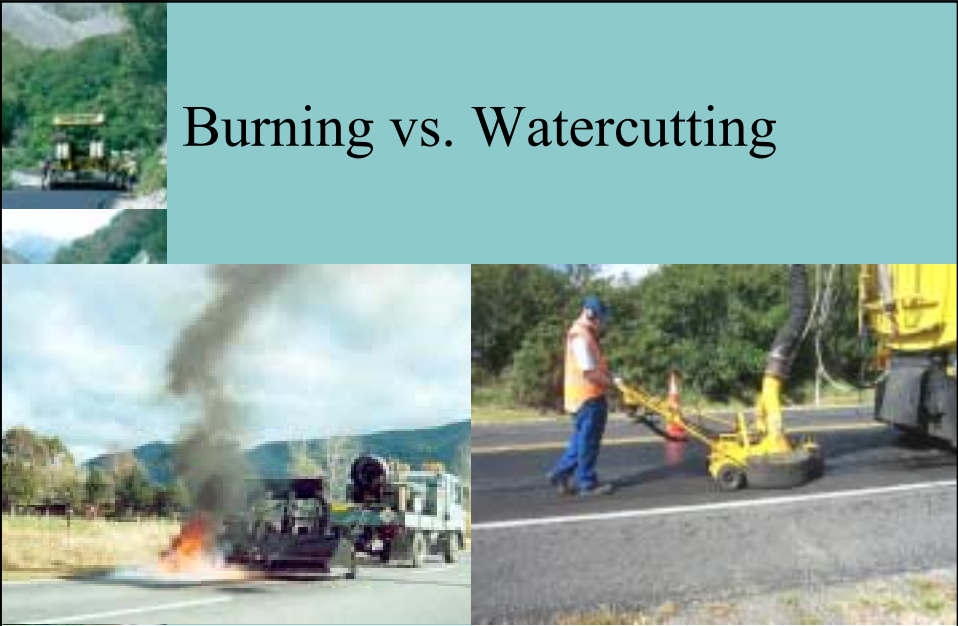



Watercutting Flushed Surfaces

- Burning excess bitumen off the road is banned
- Watercutting is now used to remove the excess
- Excess bitumen is removed from site
- Long Term Treatment – no need for resurfacing.
- No waste of non renewable bitumen and chip.


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Burning vs. Watercutting

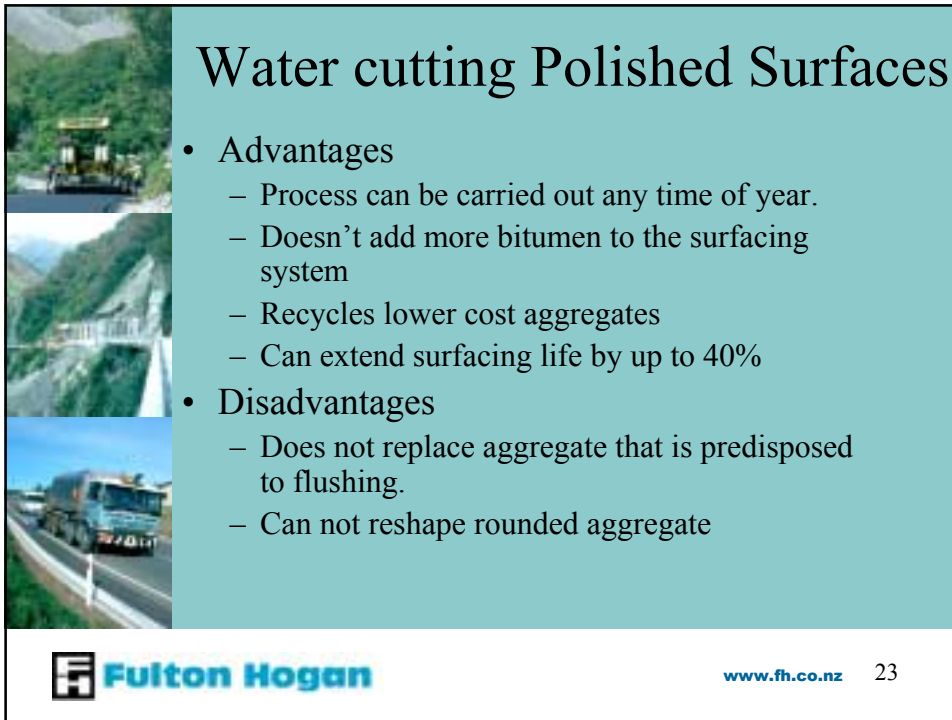


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Visible improvement in Texture




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Water cutting Polished Surfaces

- Advantages
 - Process can be carried out any time of year.
 - Doesn't add more bitumen to the surfacing system
 - Recycles lower cost aggregates
 - Can extend surfacing life by up to 40%
- Disadvantages
 - Does not replace aggregate that is predisposed to flushing.
 - Can not reshape rounded aggregate


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Visible improvement to surface


 

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Acknowledge

- Fulton Hogan
- Land Transport New Zealand
- Transit New Zealand

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Thank you for driving carefully through the village

CINQUE JACETS

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