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| Safe Work Instruction        | Issue date: 28/04/09  |
| <b>Deval Machine Testing</b> | Review date: 27/04/12 |

|   |  |   |  |                                     |
|---|--|---|--|-------------------------------------|
| <b>Document no.</b>   | <b>Work description</b>  |   |  |                                     |
| SMS-06-SW-1349  | Using Deval machine to conduct resistance to wear by attrition test  |   |  |                                     |
|   | <b>Scope</b><br>This instruction outlines the hazards and controls in the operation of Deval Machine to test samples in resistance to wear by attrition in Shed A with prior preparation in Geotechnical Laboratory.   |   |  |                                     |
| <b>Review date</b>  | References   |   |  |                                     |
| 27/04/12  | AS 1141.27-1999 Methods for sampling and testing aggregates – Method 27 Resistance to wear by attrition.<br>NSW OHS Regulation 2001, Part 5.4 Working with Plant<br>AS 4024.1 Safeguarding of Machinery<br>SMS-06-GD-0225 Plant<br>SMS-16-SR-0057 Inspection and Testing |   |  |                                     |
| <b>Responsible supervisor</b>   |  | <b>PPE and precautions</b>  | <b>Competencies or qualifications</b>  | <b>Licences or permits required</b> |
| Robert Coventry<br>Geotechnical Technician  |  | Safety Boots<br>Oven Gloves<br>Hearing protection 85 dbA<br>Safety glasses<br>P2 Dust Mask<br>Operate according to the manufacturer's instruction | Engineering Certificate on soil / aggregate testing<br>Trained in the use of Deval Machine<br>Competent in the use of this SWI | nil                                 |
| <b>Tools and equipment required</b>   |  |   |  |                                     |
| Deval Machine   |  |   | Sieves   |                                     |
| Balance   |  |   | Oven   |                                     |
| Test Cylinders  |  |   | Socket spanner   |                                     |
| Transport trolley   |  |   |  |                                     |
| IF CONTROL MEASURES ARE NOT SUITABLE AND MAJOR CHANGES ARE NEEDED, CONDUCT A RISK ASSESSMENT AND DEVELOP NEW CONTROLS ACCORDING TO <a href="#">SMS-06-PR-0104 WORKPLACE RISK MANAGEMENT</a> . |  |   |  |                                     |



### Warning

Operator must use correct manual handling technique to place samples into machine

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| <b>Site / job planning</b> | Ensure immediate environment is safe for work e.g. adequate lighting, no loose materials, no chemical spills.<br>Ensure good housekeeping. |
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| <b>Pre-operational checks</b> | Ensure Deval machine or Shed A have installed safety circuits<br>Ensure Deval machine is maintained, serviced and cleaned according to manufacturer's manual<br>Ensure Deval machine has been inspected and tested according to inspection and testing requirement |
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|  |  |                                 |  |
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| <b>Preparation of test cylinders in Laboratory</b> | Place steel test cylinder onto balance and tare  | <b>Hazards:</b> Manual handling | <b>Control:</b> ensure operator is trained in manual handling techniques, and use correct tools and posture<br>Use other personnel to "share the load" |
|  | Insert a mass of clean water equivalent to the mass of the test portion into test cylinder | Low risk                        |  |
|  | Remove test cylinder from balance  | Manual handling                 | Ensure operator is trained in manual handling techniques, and use correct tools and posture<br>Use other personnel to "share the load"                 |

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| <b>Preparation of test ctd.</b>     | Place plastic washer and steel lid onto test cylinder and lock down with nuts via socket spanner | Repetitive strain to hands and wrist  | Instruction to operator not to over-tighten nuts and use correct tools   |
|                                     | Repeat with other test cylinders for test  | As above  | As above   |
|                                     | Use hand trolley to transport prepared test cylinders from Laboratory to Shed A Deval Machine    | Manual handling in mobilising cylinders and trolley   | Ensure operator is trained in manual handling techniques, and use correct tools and posture<br>Use other personnel to "share the load" |
| <b>Using Deval machine</b>          | Ensure cable of Deval Machine is tagged for maintenance, serviced and safe to operate            | <b>Hazards:</b><br>Contact with electricity<br>Not tagged                                   | <b>Control:</b><br>Stop work and organise maintenance and service  |
|                                     | Place test cylinders into Deval machine and seat in revolving frame                              | Manual handling in lifting cylinder   | Ensure operator is trained in manual handling techniques, and use correct tools and posture<br>Use other personnel to "share the load" |
|                                     | Lock down test cylinder  | Repetitive strain to hands and wrist  | Instruction to operator not to over-tighten nuts and use correct tools   |
|                                     | Based on revolution counter, once set up number is achieved, machine turns off automatically     | Set up wrongly or read wrongly  | Check with others before switch on<br>Read with enough lights  |
|                                     | Close lid and Let Deval machine run  | Industrial noise below 85 dBa from Deval Machine<br>Dust inhalation<br>Foreign body to eyes | Wear ear muff during revolution<br>Dust mask<br>Safety glasses   |
|                                     | Removal of test cylinder from revolving frame to trolley, remove power cable from power point    | Contact with electricity  | Ensure Deval machine has been inspected and tested according to requirement<br>Ensure Safety Switch is installed                       |
| <b>Test cylinders in Laboratory</b> | Wheel test cylinders   | Manual handling in lifting cylinder   | Ensure operator is trained in manual handling techniques, and use correct tools and posture<br>Use other personnel to "share the load" |
|                                     | For post attrition test, remove all materials from cylinders                                     | Dust inhalation<br>Foreign body to eyes   | Dust mask<br>Safety glasses  |
|                                     | Thoroughly wash the portion retained   | Allergy to dust and dirt<br>And As above  | Oven gloves with cotton linings<br>As above  |
|                                     | Place the retained portion into oven   | As above  | As above   |
|                                     | Perform calculation and report results   | Low risk  |  |
|                                     | Repeat test for duplicate test cylinder  | As above  | As above   |
| <b>Additional controls</b>          |  |   |  |
|                                     |  |   |  |