UPDATING OF THE NRA MCDRW AND SRW:
600 Series Earthworks

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Talk outline

1. Background to the Specification
2. Scope of current Arup work
3. Additions to current Specification
• Volume 1 – Specification for Road Works

• Volume 2 – Notes for Guidance on the Specification for Road Works

• Volume 3 – Method of Measurement for Road Works and Notes for Guidance on the Method of Measurement for Road Works

• Volume 4 – Road Construction Details
Background to the Specification

What’s it for?
• Construction Specification

• Classifying material based on acceptability criteria

• Base Specification and Contract specific Appendices
NRA SRW

• **Specification** for Road Works and **Road Construction Details** (Volume 1 and Volume 4)

• **Appendices** (based on guidance in Volume 2) and **Method of Measurement** (based on items rules in Volume 3)
Arup scope of work
Review of common details in Employers Requirements
Review of international Codes and Specifications
Updates to NRA SHW
Rock Slopes and Blasting

- Construction controls
- Pre-split
- Monitoring
- Notification periods / requirements
Rock Slopes and Blasting
Rock Slopes and Blasting

NOTES:
1. THE MAXIMUM PERMITTED ROCK SLOPE ANGLE SHALL BE AS SPECIFIED IN APPENDIX 6/3

[Diagram showing rock slope and blasting details]
New materials and testing

6N Select Granular Fill – Fill to Structures

6N1 Select Granular Fill – Fill to Structures

6N2 Select Granular Fill – Fill below Structures
New materials and testing

**2C** - Stony cohesive material – General Fill

**2C1** - Stony cohesive material (High Fines Content)

**2C2** - Stony cohesive material (Low Fines Content)
### Materials and Testing

<table>
<thead>
<tr>
<th>Class</th>
<th>Works, Goods or Material</th>
<th>Test</th>
<th>Frequency of Testing**</th>
<th>Test Certificate</th>
<th>Comments</th>
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<tr>
<td>601, 631 to 633, 635 to 637, 640</td>
<td>Class 1 Granular Material</td>
<td>Grading</td>
<td>1 test per 1,000m³ for each source*</td>
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<td></td>
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<td>MCV</td>
<td>As Required*</td>
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<td></td>
<td></td>
<td>LA Coefficient (IL)</td>
<td>1 test per 1,000m³ for each source (min of 2 total per source)*</td>
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<td>(Class 1C Only)</td>
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<td>Plastic Limit</td>
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<td>Class 2 Coh.</td>
<td>MCV</td>
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<td>Effective Angle of Internal Friction and Effective Cohesion</td>
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<td>MC (IL)</td>
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<td>MCV (IL)</td>
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<td>Class 5 Topsoil</td>
<td>Grading</td>
<td>1 test per 500m³ (min of 1 per day during topsoiling works)*</td>
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<td>Class 6 Selected Granular Material (Class 6A, 6B &amp; 6C)</td>
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<td>1 test per 1,000m³ for each source*</td>
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<td>Uniformity Coefficient</td>
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<td>Plastic Limit (IL)</td>
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<td>LA Coefficient (IL)</td>
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<td>Class 6A &amp; 6C Only</td>
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<td>1 test per 1,000m³ for each source (min of 2 total per source)*</td>
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<td>MC</td>
<td>1 test per 500m³ for each source*</td>
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<td>LA Coefficient (IL)</td>
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<td>Stake Durability (IL)</td>
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<td>Total Sulfur Content (IL)</td>
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<td>Class PA (asphalt) content (IL)</td>
<td>2 per source*</td>
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<td>Bitumen Content (IL)</td>
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<td>Class 6 Selected Granular Material (Class 6G)</td>
<td>Grading</td>
<td>1 test per 250m³ for each source (min of 2 total per source)*</td>
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<td>LA Coefficient (IL)</td>
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Lime and cement improvement

• Lime and Cement Improvement to Form General Fill
• Addition of Lime + pulverisation / mixing of material
• Addition of cement binder (as required by individual designs)
• Demonstration area
• Work to be done when temp. is > 3°
Argillaceous material

.. shall mean shales mudstones siltstones and slates and micaceous schists **composed** of **particles of clay** and **silt** and **mica**.
Argillaceous material

• False Positives
  (see notes for guidance)
Karst

- Focus on Volume 2 and sample Appendices
- Whole life design
- Drainage considerations
Karst

3m
Environmental requirements

- Construction and Demolition Waste Management Plan / Execution Quality Assurance Plan
- Testing and classifying
- Based on Department of the Environment best practice guide

*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects*

Department of the Environment, Heritage and Local Government, July 2006
Crib walls and gabions

• Foundation treatment

• Comply with NRA BD2 where retained height exceeds 1.5m

• Backfill to crib walling to be 6N material
Cut slopes and embankment slopes shall have a maximum gradient of 1 vertical to 2 horizontal.

The use of Light Weight Fill is not allowed for routine construction.
• A prescriptive approach for the certification of geotechnical elements throughout the project life-cycle.

<table>
<thead>
<tr>
<th>Key Stage</th>
<th>Outputs Required</th>
<th>Approx. Project Stage</th>
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</table>
| 1         | • Define the geotechnical classification  
            • Identify geotechnical risks (create a geotechnical risk register)  
            • Prepare a Statement of Intent Document | Preliminary Design |
| 2         | • Prepare a Preliminary Sources Study Report (Desk Study)  
            • Prepare a Ground Investigation Report | Preliminary Design |
| 3         | • Geotechnical certification  
            • Prepare a Geotechnical Design Report | Detailed Design |
| 4         | • Prepare Geotechnical Feedback Report | Construction |
**Geotechnical Category 1:** small and relatively simple structures, earthworks or geotechnical activities, for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations.

**Geotechnical Category 2:** include conventional types of geotechnical structures, earthworks and activities, with no exceptional geotechnical risks, unusual or difficult ground conditions or loading conditions.

**Geotechnical Category 3:** include very large, unusual or complex geotechnical activities, earthworks and structures or those involving abnormal geotechnical risks or unusual or exceptionally difficult ground conditions.
Thank you, questions...

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