**NG SAMPLE APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF WORKS MATERIALS**

 *[Note to Compiler: This should include]*

1. Acceptable limits for the fills in Table 6/1 appropriate to the Contract [Table 6/1, 602.1 and 608.1] and including:
	1. permitted Classes where alternatives are listed in the Specification;
	2. those materials, which may be used for landscape fill Class 4;
	3. cross-references to Drawings showing location of 'zoning' of general and selected fills;
	4. additional sub-divisions of Classes in Table 6/1 required for the Contract;
	5. alternative and additional requirements for triaxial and shear box tests [633 and 636].
2. Special requirements for determining acceptability, who classifies and where, and whether trial pitting is required [See NG 602.1]. Where the Contractor is responsible for testing, the tests required should be scheduled in Appendix 1/5 and cross-referenced here.
3. Any requirement for processing to render unacceptable material Class Ul acceptable, cross-referring to Drawings where necessary, for each type of material to be processed and class of material to be produced [Wherever possible the means of processing should be left to the Contractor [6.
4. Requirements for groundwater lowering or other treatment.
5. MCV and additional testing requirements for material to be improved by the addition of lime and/or lime cement.
6. Details of testing (type and rate) to be undertaken during the completion of a lime and/or cement improvement demonstration area.
7. Any permitted use of the rapid assessment procedure for material acceptability.
8. Requirements (if any) for removal off site of excavated acceptable material or unacceptable material requiring processing [602.3] or retention of surplus material on site [602.5].
9. Requirements for In Situ Resistivity Tests [637.2].
10. Requirements for In Situ Redox Potential Tests [638.2 and 638.5].
11. Requirements for the assessment of the effects of water soluble (WS) sulfate, oxidisable sulfides and total potential sulfate in accordance with TRL Report 447, Test Nos. 1 to 5 [643.1].
12. Requirements for the magnesium sulfate (MS) soundness test [635.2].

**NG SAMPLE APPENDLX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U2 UNACCEPTABLE MATERIAL**

*[Note to Compiler: This should include]*

1. Drawing references for excavation and disposal of known Class U2 material.
2. Pre-agreed environmental requirements for disposal including specific sites (DOE, EPA, Local Authority, etc. as required).
3. Reference to the Construction and Demolition Waste Management Plan [602.6].
4. List of known hazardous materials likely to be encountered.
5. Methods of excavation, precautions and requirements for handling.
6. Special requirements for dealing with leachate and contaminated water.
7. Requirements for special drainage and for sealing exposed surfaces of contaminated materials.
8. Test methods to be used for chemical analysis of hazardous materials, leachate and contaminated water should be scheduled in Appendix 1/5.

**NG SAMPLE APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)**

*[Note to Compiler: This should include]*

1. The drawing numbers of all drawings which give related earthworks requirements including line and level.
2. Blasting for excavation:
	1. Locations where blasting is permitted [607.2].
	2. Time limits when blasting can take place [607.4]. [Ensure compatibility with Clause 109 and Appendix 1/9 requirements for noise and vibration].cross-references to Drawings showing location of' ‘zoning' of general and selected fills;
	3. Pre-split blasting requirements [603.4].
	4. Details of noise and vibration monitoring in property off Site during blasting operations and proposed limiting values.
	5. Trial explosion requirements.
3. Cutting faces requirements for:
	1. Undercutting restrictions - extent and limitations for sequential excavation and backfilling, where Contractor is required to undercut slopes or toes of cuttings [603.2]. *[Note that where similar requirements exist for embankments e.g. where drainage excavations are close to the toe, these should also be covered in this Appendix].*
	2. Clearing loose material, where no topsoiling is required, by airline hose or water hose including maximum pressure and nozzle arrangements [603.5(iv)].;
	3. Making face stable, where no topsoiling is required, including depth of cut-back and thickness of cementitious material to be applied if different from Clause 603, location and type of reinforcement and details of weep holes. [Rock bolting should be described in Appendix 6/10.
	4. Protecting face of soft or insecure material interlayered with rock, where no topsoiling is required, including depth of back and details of masonry infill.
	5. Making good prior to topsoiling *[indicating which, if any, of the measures in 603.7 are required, and where.]*
4. Watercourses including ditches etc.
	1. Locations where blasting is permitted [607.2].
	2. Redundant where draining and clearing required, extent of excavation and Classes of fill for their infilling ][606.4].
5. Embankment Construction:
	1. Limits on oversteepening or in increase in width [608.5].
	2. Stage construction of fills details and rates of controlled filling [606.6].
	3. Surcharging details including time period, type of surcharge material, initial level of top of surcharge above designed formation or sub-formation [608.7].
	4. Description of location, class and thickness of starter layers [608.2].
6. Compaction 1612]:
	1. General:
		1. Requirements if compaction not to comply with Clause 612 [612.1].
	2. Method compaction:
		1. Locations where extra compaction in top 600 mm for Classes 1A, IB, 2A, 2B, 2C1, 2C2 and 2D is not required for full width of embankment or between outer extremities of verges..
		2. Requirements for compaction of drainage materials other than Class 6H.
	3. End-product compaction:
		1. Whether a nuclear surface density gauge is to be used or is permitted for measuring field dry densities [612.15].
7. Limiting distance for deposition of materials referred to in sub-Clause 601.6 or 601.7.
8. Locations of excavations that are permitted to be battered and requirements for benching prior to backfilling and compaction [60213.
9. Locations where excavation supports are to be left in position [602.13].
10. Requirements for benching or shaping to natural or earthworks slope faces to receive fill [608.10]. Location of and benching requirements for cutting slopes to receive Treatments I or II [618.5].

**NG SAMPLE APPENDIX 6/4: NOT USED**

**NG SAMPLE APPENDIX 6/5: GEOTEXTILES USED TO SEPARATE EARTHWORKS MATERIALS**

*[Note to Compiler: This should include]*

1. Drawing references for locations where geotextiles are to be used in separation layers [609.1].
2. Whether the geotextiles are to be of synthetic or other fibres [609.1].
3. Minimum life expectancy [609.2].
4. Numbers of samples for subsequent testing. [609.4].
5. Additional testing criteria not included Clause 609.
6. Details of laying and lapping if other than as in sub-Clause 609.5.
7. Number of tests on samples. [609.8]

**NG SAMPLE APPENDIX 6/6: FILL TO STRUCTURES, FILL ABOVE STRUCTURAL FOUNDATIONS AND FILL BELOW STRUCTURAL FOUNDATIONS.**

*[Note to Compiler: This should include]*

1. Drawing references for fill to structures and fill above structural foundations.
2. Whether Classes 6N1, 6N2 or 6P require full scale determination of stable slope, and value of slope if not 1 to 1.5 [610.6].

**NG SAMPLE APPENDIX 6/7: SUB-FORMATION AND CAPPING AND PREPARATION AND SURFACE TREATMENT OF FORMATION**

*[Note to Compiler: This should include]*

1. Drawing references which show locations where capping is required and its thickness [613.1] for each type of pavement.
2. Allowable surface level tolerances.
3. Permitted Classes of capping.
4. Requirements for a demonstration area or areas [613.9] including location and protection [613.10]. Requirements for removal and reinstatement of demonstration area if not forming part of the permanent works [613.11].
5. Locations where treatment of formation is required [613.4 and 613.7].

**NG SAMPLE APPENDIX 6/8: TOPSOILING, GRASS SEEDING AND TURFING**

*[Note to Compiler: This should include]*

1. Whether imported topsoil Class 5B is required. [618.2].
2. Whether the requirements of sub-Clause 618.3 apply *[only when majority of topsoil (Class 5A) to be stripped for re-use has high clay content, to avoid degradation following prolonged rainfall]*. Cumulative rainfall if not 100 mm.
3. References to drawings which show the areas to receive Treatments I, II or III. [618.4].
4. Thickness of topsoil to be deposited in Treatments I and II and when a tracked vehicle may not be used for spreading. [618.6(i)].
5. When hydraulic mulch seeding is not permitted for Treatment I. [618.4(i)].
6. List of areas of cutting slopes which do not need harrowing or harrowing depth if not 50 mm. [618.5(ii)]
7. Rate of distribution of fertiliser to be raked in, if other than 75g/m\ [618.6(iv)(b)].
8. Rate of distribution of seed if different from sub-Clause 618.7(h).
9. Measures for retaining turf on slopes. [618.8(iv)].
10. Requirements for glass fibre or other material to form a retaining agent in hydraulic mulch seeding. [618.9].
11. Drawing references which show areas of grass not to be mown or to be mown three times. [618.10].
12. Mowing plant requirements, if any. [618.10].
13. Seed mixture requirements which differ from those listed in Table 6/5 and drawing references showing areas where required [618.13].
14. Whether surplus topsoil is to be stored or disposed of by the Contractor. Details of topsoil storage areas such as location, height, contours and batter slopes [602.12].
15. Drawing references which show the locations where topsoil and vegetation is to be left in place [602.10].
16. Drawing references which show average depths to which topsoil is to be stripped [602.10].

**NG SAMPLE APPENDIX 6/9: EARTHWORK ENVIRONMENTAL BUNDS, LANDSCAPE AREAS, SCREENING MOUNDS, STRENGTHENED EMBANKMENTS**

*[Note to Compiler: This should include]*

1. Earthwork Environmental Bunds
2. References to Drawings which show locations and which state type of construction [619]:
	1. a normal embankment to Clause 608; if so whether method compaction to Clause 612 is required and which Method in Table 6/4 to adopt and Classes of fill permitted or required;
	2. a strengthened embankment to Clause 621; if so requirements as listed in 3 below;
	3. a reinforced or anchored earth structure to Clause 622; if so full details of construction.
3. Requirements for early construction.
4. Requirements for topsoiling and seeding/turfing.
5. Landscape Areas and Screening Mounds
6. References to Drawings which show locations
7. If compaction to be ‘method’ to Clause 612 and if so which method in Table 6/4 to adopt.
8. Details of contouring required.
9. Locations where landscape areas may be constructed simultaneously with adjoining embankments.
10. Requirements for topsoiling and seeding/turfing.
11. Strengthened Embankments
	1. Reference to Drawings which show locations, details of construction and Classes of fill.
	2. Requirements for strengthening materials.

**NG SAMPLE APPENDIX 6/10: GROUND ANCHORAGES, CRIB WALLING AND GABIONS**

*[Note to Compiler: This should include]*

1. Ground Anchorages [624]
	1. Details of ground anchor type;
	2. Reference to drawings showing layout and typical anchor details;
	3. Construction requirements
	4. Specification for anchor, tendons, grouting, tensioning and corrosion protection;
	5. Testing requirements (loading, frequency of test, reporting)
	6. Trial installations
2. Crib Walling [625]
3. Reference to drawings showing locations and outline;
4. Specification for component parts;
5. Foundation treatment requirements
6. Construction requirements and methodology

1. Gabions [626].
2. References to drawings showing locations and layout;
3. Type of mesh required (core diameter, opening sizes etc.);
4. Specification for infill material;
5. Foundation treatment requirements;
6. Gabion wall backfill details;
7. Permanent drainage details.

**NG SAMPLE APPENDIX 6/11: SWALLOW HOLES AND CAVITIES**

 *Note to Compiler: This should include]*

1. Drawing references showing locations of voided ground;
2. Drawing references showing locations prone to karstification or where swallow holes or other naturally occurring cavities are likely to occur over the design life of the road.
3. Methodology for inspecting voids where required;
4. Requirements for filling and method of material placement;
5. Grouting type and procedure;
6. Details of other permitted treatments;
7. Requirements for concrete caps to voids (visible at formation or otherwise) or soft areas;
8. Requirements to mitigate risk to Road Works from the potential for voids to form over the lift of the Road Works.

**NG SAMPLE APPENDIX 6/12: INSTRUMENTATION AND MONITORING**

 *Note to Compiler: This should include]*

1. Drawing references showing locations and extent of instrumentation including that required for staged construction. *Note: instrumentation and monitoring for blasting should be covered in Appendix 6/3 and for dynamic compaction in Appendix 6/13;.*
2. Schedules of instruments by type and description with alternatives where possible;
3. Details of protection measures, connections and housing;
4. Installation timing and techniques;
5. Calibration requirements;
6. Details of responsibility for instrumentation installation and monitoring.
7. Frequency of readings and method of reporting readings where the Contractor is required to carry out these tasks.
8. Trigger values, limits and actions required if trigger levels are approached or exceeded.

**NG SAMPLE APPENDIX 6/13: GROUND IMPROVEMENT**

 *Note to Compiler: This should include]*

1. Dynamic Compaction
2. Drawing references showing locations where dynamic compaction is required.
3. For end-product: performance requirements in terms of tolerable further settlement after the process has been completed.
4. For method, the following where applicable:
	1. Special; drainage requirements;
	2. Class and thickness of granular layer;
	3. Mass, shape and contact area of pounder;
	4. Height(s) of drop and spacing of imprints;
	5. Number of drops;
	6. Arrangements and number of passes;
	7. Requirements, including class of material, for filling of imprints;
	8. Requirements for instrumentation, monitoring and testing.
5. Other Methods

For other methods of approved ground improvement:

1. Drawing references showing locations where each method is to be applied;
2. Typical details for the treatment proposed;
3. Details of spacing, depth, size etc.
4. Specification details.
5. Testing requirements.