ROADWORKS SPECIFICATION

R22 EARTHWORKS

Date JUNE 2012

Department *of* Infrastructure, Energy *and* Resources

Tasmania
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DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R22 – EARTHWORKS
June 2012

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R22.1 SCOPE

This specification sets out the requirements for all road earthwork activities including the excavation of cuttings, construction of embankments and sound mounds, disposal of surplus and unusable materials, and the treatment of local existing pavement failure areas.

R22.2 OBJECTIVES

This specification aims in conjunction with other DIER Standard Specifications to ensure that:

- earthwork construction provides a long-term stable platform of sufficient strength onto which pavement layers can be compacted
- the materials placed, and the standards of construction adopted, are sufficient to provide the level of performance required from the overlying pavement structure
- materials supplied to DIER contracts have been produced under controlled conditions using and producing products of known and acceptable quality and variability.
- production is managed to minimize variability
- materials are stored and handled in a manner that is not detrimental to their immediate or long-term performance
- inspections, sampling and testing are undertaken in a systematic manner by appropriately qualified persons using reliably calibrated equipment
- there is documented evidence, readily available to the Superintendent, which demonstrates that the specified requirements are met.

R22.3 REFERENCES

Earthwork activities shall be compatible with the provisions of all DIER Standard Specifications for Design, Construction and Maintenance, Austroads Guides And Test Methods and Australian Standards in particular:

DIER Standard Specifications

- G1 – General Provisions
- G2 – Contract Management Plan
- G3 – Traffic Management
- G6 - Production of Aggregate and Rock Products
- G9 – Product Quality
- G10 – Construction Environmental Management Plan
- R21 – Clearing and Grubbing
- R23 – Subgrade Zone
- R24 - Geotextiles
- R33 – Subsoil Drains
- R40 – Pavement Base and Subbase.

Austroads Guides to Pavement Technology

- Part 4L – Earthworks Materials
- Part 8 – Pavement Construction (Section 4 Earthworks).

There are a number of Austroads reports referenced in these guides that are also to be used particularly:

- AP-C87/08 Glossary of Austroads Terms

Australian Standards

- AS 1348 – Road and Traffic Engineering – Glossary of Terms

R22.4 DEFINITIONS

Topsoil is defined as the root mass of grasses and all accumulated organic litter, peat and other organic material.

Stripping is defined as the removal of topsoil only.

R22.5 EARTHWORKS MANAGEMENT PLAN

Further to *Standard Specification G2 Contract Management Plan,* the Contractor's Earthworks Management Plan shall include:

- programme of works with key performance targets
- stockpile sites for all materials e.g. topsoil, excavation/embankment material
- topsoil quantity estimate and reuse plan
- production of rock and aggregates plan in accordance with *Standard Specification G6 Production of Aggregate and Rock Products* if produced from site excavations
- details of the equipment, rolling and inspection procedures to be used
- cross references between lot numbers allocated and the unique product number.

Submission and acceptance of the earthworks management plan is a Hold Point.

R22.6 TOLERANCES

Earthworks shall be finished to uniform surfaces. During construction, surfaces including finished surfaces shall be shaped in a manner to avoid ponding of water.

The limits of earthworks shall be defined as 1 metre from the top and toe of batters.

Surfaces shall be finished with the following tolerances:

- the formation width, measured between top of batter in embankment and toe of batter in excavation, shall not be less than the width specified on the Drawings
- before placing subgrade on embankments, the top of the embankment shall be trimmed parallel with the design formation surface, to within 0mm above and 60mm below the calculated level
- in general excavations the top of the subgrade shall be finished to within 0mm above and 60mm below the design formation surface. Where the insitu material in the subgrade zone in general excavations is removed, the bottom of the excavation shall be trimmed to within 0mm above and 60mm below the calculated level of base of subgrade
- the base of rock excavations shall be excavated so that no rock or rock pieces are above the design formation surface
- where batters are required to be excavated with a slope equal to or flatter than 1 vertical to 1 horizontal, no point on the completed batter shall vary from the designed slope by more than 300mm, measured normal to the batter, and not more than 20 percent of the completed batter shall exceed the required slope
- in urban areas where the batter forms part of the street verge, the tolerance will reduce to minus 50mm after allowing for subsequent spreading of the topsoil
- where batters are required to be excavated with a slope steeper than 1 vertical to 1 horizontal, the face, for a vertical distance of 2 metres above the toe, shall be trimmed so that there is no encroachment within the designed cross-section
- the face of excavations more than 2 metres vertically above the toe may project within the designed cross-section provided the area of encroachment does not exceed 20 percent of the face. The projection of any point encroachment shall not exceed 300mm, measured normal to the slope.
- embankment slopes shall be constructed so that, within a vertical distance of 1.2 metres below the formation, no point on the completed fill batter shall vary from the designed batter by more than 150mm, measured normal to the slope. Lower than 1.2 metres

below the formation, no point on the completed batter shall vary from the designed batter by more than 300mm.

- slopes shown on Drawing cross-sections represent requirements for the types of material expected and are subject to amendment by the Superintendent to suit material actually encountered. Where the Superintendent amends a slope while work is in progress at the particular site, the Contractor shall not be entitled to claim a variation to the scheduled rate for excavation.
- unless stated otherwise in the Specification, the top of all excavation batters, and the bottom of all embankment batters shall be rounded. Where the batter length at the design slope is less than 4 metres, the slope shall be altered so that a 4 metre batter length is maintained.

R22.7 SEPARATION LAYERS AND DRAINAGE BLANKETS

Where shown on the Drawings or when directed by the Superintendent, the Contractor shall place a layer of geotextile over the areas indicated. Unless otherwise specified the geotextile shall comply with the requirements for in *Standard Specification R24 Geotextiles*. All joins in the geotextile shall overlap for at least 500mm.

Where shown on the Drawings or when directed by the Superintendent a rock drainage blanket or sand drainage blanket shall be constructed. The drainage blanket shall be constructed to drain to either a subsoil drainage system complying with *Standard Specification R33 Subsoil Drains*, or to open drains complying with *Standard Specification R31 Open Drains and Channels*.

Unless specified otherwise the drainage blanket shall be constructed to the following requirements.

- the layer shall be nominally 200mm thick for sand blankets and 300mm thick for rock blanket, constructed with free-draining material fully wrapped by geotextile
- the geotextile shall comply with the requirements given in *Standard Specification R24 Geotextiles*, for the type of drainage blanket specified
- the geotextile shall have a minimum overlap of 500mm at each join.

R22.8 EXCAVATION

R22.8.1 Description of Work

Excavation shall consist of the stripping of topsoil and the removal of material from all cuttings for the use in embankments in accordance with the Specification or for disposal. Excavation shall also consist of the removal and disposal of material failing to meet the requirements of this Specification for Embankment Foundation.

No earthwork activities shall commence prior to the installation of the Contractor's Environmental Control Measures in accordance with *Standard Specification G10 Construction Environmental Management Plan*.

This is a Hold Point.

Table drains shall be formed at the toe of excavations as part of general excavation and shall be measured and paid for as excavation.

R22.8.2 Classification of Material to be Excavated

Material to be excavated shall be classified as either rock or ordinary excavation.
Rock shall be hard or strongly cemented beds or masses which cannot be ripped at a production rate exceeding that rate in *Table R22.1 – Production Rates to Define Rock* listed against the particular class of equipment, as defined in AS 2868.

Proving material to be rock shall be the Contractor's responsibility. The machine employed shall be in good condition, with matching heavy duty single tyre ripper or rock bucket fitted with rippers. The Superintendent shall have the right to direct operations of the equipment and to nominate an operator during the proving operation.

Table R22.1 - Production Rates to Define Rock

Crawler Tractor Operating Mass kg	**EXCAVATION RATE SOLID m^3/hr**
20,000 - 29,000	15
29,000 - 44,000	20
44,000 - 58,000	30
Excavator	
27,000 - 38,000	10
38,000 - 44,000	15
44,000 - 50,000	20
50,000 - 60,000	25
60,000 - 68,000	35

Boulders and detached pieces of solid rock, measuring at least 2 m^3, shall also be classified as rock.

Ordinary excavation shall comprise excavation in all materials other than those defined as rock.

R22.8.3 Over-Excavation

Replacement material for reinstatement of over excavation to outside the dimensions shown on the Drawings or as described in the Specification shall comply with the following requirements:

- depressions excavated into the insitu subgrade zone defined in *Standard Specification R23 Subgrade Zone* in ordinary excavation shall be reinstated with subgrade material complying with the requirements of *Standard Specification R23 Subgrade Zone*. This material shall be compacted to a minimum characteristic dry density ratio of 100% of Standard Compaction
- depressions excavated below the base of the subgrade zone in ordinary excavation shall be reinstated with subgrade material complying with the requirements of *Standard Specification R23 Subgrade Zone*, and compacted to a minimum characteristic dry density ratio of 95% of Standard Compaction
- depressions excavated below design formation level in rock excavations shall be reinstated with sub-base material complying with *Standard Specification R40 Pavement Base and Subbase*, and compacted to a minimum characteristic dry density ratio of 95% of Modified Compaction
- if the combined thickness satisfies the sub-base layer thickness requirements for compaction, given in *Standard Specification R40 Pavement Base and Subbase*, then compaction of the depression infill may be combined with compaction of the first layer of sub-base.

There shall be no payment for reinstatement of over excavation to outside the dimensions shown on the Drawings or as described in this Specification.

R22.8.4 Excavated Material

All excavated material including topsoil shall become the property of the Contractor. If some or all excavated material complies with the requirements for the supply of materials for other

parts of the works as defined in the relevant Standard Specification then such material may be used for such purposes.

The contractor is to allow for the retention of sufficient topsoil on site to cover all batters and other areas as specified in the Project Specification with details of quantities and stockpile locations to be in the Earthworks Management Plan. Excess material may then be disposed off in accordance with *Standard Specification G1 General Provisions Clause G1.6.6 Disposal of Material and Standard Specification G10 Construction Environmental Management Plan*.

No topsoil shall be removed from the site when there is sufficient area to place it.

No topsoil shall be removed from the site until approval has been granted by the Superintendent.

Disposal of excess and/or waste material shall be in accordance with *Standard Specification G10 Construction Environmental Management Plan*.

R22.8.5 Imported Embankment Material

When imported embankment material is specified it shall be under the following conditions:

- no embankment material shall be imported without prior approval of the Superintendent
- all imported embankment material shall comply with this Specification
- the Contractor shall make provision in his rate for excavation for the breaking down of all rock so that all excavated material, which complies with this Specification, is used in embankment construction
- necessary permits and licences are supplied for imported material sources in accordance with *Standard Specification G1 General Provisions Clause G1.6 Approvals.*

R22.8.6 Stockpiles

Stockpile including locations shall be in accordance with *Standard Specification G10 Construction Environmental Management Plan.*

Where the Contractor wishes to establish stockpiles they shall be so arranged that a minimum of damage occurs to natural vegetation and trees.

Where clearing is required, it shall be carried out in accordance with *Standard Specification R21 Clearing and Grubbing*. The stockpiles shall be so positioned that the stockpiles do not interfere with drainage, create a dust nuisance or inhibit the safe sight distance of traffic traversing the work site.

The maximum height of any stockpile shall not exceed 2.0 metres unless otherwise approved by the Superintendent.

Stockpiled topsoil shall be managed so that the quality of the material is not diminished noting that topsoil kept in stockpiles or windrows greater than 600mm in height is at an increased risk of becoming sour.

R22.8.7 Treatment at Joints with Existing Roads

Where the existing road pavement lies within the area of new pavement, the existing pavement shall be removed to allow full depth construction of the new pavement, unless otherwise indicated on the Drawings. Old pavement material may be reused if it complies with *Standard Specification R40 Pavement base and Subbase*.

This treatment shall continue up to the chainage where the Drawings indicate that the new pavement must match the existing. Joints shall be inclined at approximately 1 vertical to 1 horizontal.

R22.8.8 Local Existing Pavement Failure Areas

Where the repair of existing pavements is required, the removal of material is to be classed as earthworks i.e. the boxing out (removal of material) of selected areas.

The reinstatement of any pavement failures shall be in accordance with *Standard Specification R43 Pavement and Shoulder Maintenance Clause R43.4.3 Reconstruction Patches*.

Areas of existing pavement to be repaired will be indicated on site by the Superintendent.

R22.8.9 Treatment of Redundant Road

The redundant sections of road where shown on the Drawings shall be scarified to a minimum depth of 200mm.

Any pieces of the previous pavement after scarification with a major dimension greater than 300mm shall either be further broken up or removed.

Any material satisfying other relevant standard specifications may be re-used in the construction of the new road. Where required, removed material shall be replaced.

All areas shall be reshaped to provide satisfactory drainage.

If any pavement material is removed, the removal and replacement, if required, shall be at the Contractor's expense. Replacement of material shall be in accordance with this Specification.

R22.8.10 Blasting and Structurally Damaging Processes

When blasting is required, the Contractor shall obtain the necessary licences and shall conform to the requirements of the State Explosives Regulations relating to transport, storage, handling and use of explosives. Use of explosives shall also be in accordance with the rules contained in A.S. 2187, Part 1 and Part 2.

The Contractor shall keep records of each firing, showing blasting pattern, quantity and type of explosive used, firing delay, date and time of detonation. Included shall be the quantity of explosives for each delay.

When blasting operations are being carried out, the road shall be closed and appropriate signs erected. Residents within a distance whereby they may feel the blast shall be informed and necessary precautions taken before setting off any blast.

R22.9 EMBANKMENTS

R22.9.1 Embankment Foundation

Embankment construction shall include the preparation and compaction of the areas upon which embankments shall be placed.

Generally the embankment foundation shall be stripped of topsoil and replaced with material supplied and placed according to the requirements for embankment however the Superintendent may direct that either there will be no stripping of topsoil or the depth of proposed stripping is excessive.

This is a Hold Point.

Where the Superintendent directs such limitations on stripping, e.g. over soft or swampy ground, alternative measures, such as geogrid reinforced geotextile membranes may be specified or directed by the Superintendent.

Where material below the topsoil layer is removed and replaced by embankment material, the Contractor shall provide to the Superintendent a set of marked up cross-sections showing the extent of excavation.

Where ground water seepage is encountered in the foundation area and no drainage details are shown on the Drawings, the Contractor shall advise the Superintendent, who may direct that additional drainage work be carried out.

Where embankments are constructed upon slopes steeper than 3 horizontal to 1 vertical, the foundation shall be cut into horizontal terraces over the complete area to be covered by new construction. As each layer of new embankment is constructed, the existing slope shall be stepped in successive terraces each a minimum of 1 metre wide and cut progressively as the embankment is placed. Material excavated from terraces may be recompacted into the embankment construction.

Compaction of the foundation shall be in accordance with the requirements in *Table R22.2 – Foundation Compaction*.

Table R22.2 – Foundation Compaction

OPERATING MASS kg	MINIMUM NUMBER OF PASSES
8,000 – 10,000	7
10,000 – 12,000	6
12,000 – 15,000+	4

R22.9.2 Embankment Construction

R22.9.2.1 General

All material used for embankment construction shall be free of vegetation or other deleterious matter.

The surface of embankment slopes that are to be covered by topsoil and sown with grass shall not be trimmed smooth but shall be left in a state which will prevent the erosion of topsoil.

The methods of construction employed shall be the compacted layer method and/or the mechanical interlock layer method.

The zone adjacent to earth retaining structures shall be compacted to the same density as the remainder of the fill by use of light mechanical plant using layers of appropriate thickness.

R22.9.2.2 Compacted Layer Method

The compacted layer method of construction shall be employed where the embankment fill material is other than rock or is predominantly other than rock. Where the fill material contains rock, the rock shall be of size not greater than two-thirds the uncompacted layer depth.

All fill material shall be placed uniformly in layers. The thickness of uncompacted layers shall not exceed 400 mm unless approved otherwise.

The Contractor shall be responsible for placing and compacting materials at moisture contents which permit compaction to the specified levels. No additional payment shall be allowed for modifying the moisture content of material to achieve this.

Layers of embankment shall be compacted to a minimum characteristic dry density ratio in accordance with *Table R22.3 – Compaction Requirements*.

Table R22.3 – Compaction Requirements

foundation level to 600 mm below design formation level	95% of Standard Compaction
from 600 mm to 200 mm below design formation level	100% of Standard Compaction

For materials where compaction cannot be assessed by density measurement methods, compaction shall comply with the following methods. Compaction shall be achieved by use of plant as listed in *Table R22.4 – Compacted Layer Methods Specification*.

For each layer, the maximum uncompacted thickness and the minimum number of passes shall comply with the relevant values in *Table R22.4 – Compacted Layer Methods Specification*.

Compaction shall be continued after the minimum number of passes until no further lowering of the surface occurs.

Compaction shall be carried out with the material close to or at optimum moisture content, which shall be defined as when the moisture content of the fine fraction (less than 5 mm) is at the Plastic Limit. This may be judged by hand.

Table R22.4 – Compacted Layer Methods Specification

Roller Classification	**Minimum Compaction Requirement**			
	Foundation to 600 mm below formation		**From 600 mm below formation to formation**	
	Max layer thickness (mm)	**Min No. of passes**	**Max layer thickness (mm)**	**Min No. of passes**
Vibrating Roller Kg/cm				
14 - 24	N/A	N/A	N/A	N/A
24 - 35	300	7	400	8
35 - 45	400	7	400	7
45 - 55	400	4	400	6
> 55	400	3	400	4
Pneumatic Multityred Roller Operating Mass kg				
7,000 – 15,000	N/A	N/A	N/A	N/A
15,000 – 22,000	200	8	N/A	N/A
22,000 – 30,000	300	6	200	10
> 30,000	300	8	300	8

R22.9.2.3 Mechanical Interlock Layer Method

The mechanical interlock layer method of construction shall be employed where the embankment fill material is rock or is predominantly rock, and mechanical interlock is relied upon for stability.

Hard non-naturally occurring materials (such as broken concrete) may be employed as "rock", subject to approval of the Superintendent.

All fill material shall be placed and compacted uniformly in layers. The maximum thickness of uncompacted layers shall be determined from *Table R22.5 - Mechanical Interlock Layers*

Compaction Requirements. The maximum stone size allowed shall be two thirds of the layer thickness. The minimum layer thickness of uncompacted material shall be one and a half times the maximum size of rock, or 150mm, whichever is greater.

Compaction shall be achieved by use of vibrating drum rollers. Each layer shall be given the minimum number of passes determined from *Table R22.5 - Mechanical Interlock Layers Compaction Requirements*, and continued until no further lowering of the surface occurs.

Rollers other than those given in *Table R22.5 - Mechanical Interlock Layers Compaction Requirements* shall not be used.

Table R22.5 - Mechanical Interlock Layers Compaction Requirements

Vibrating Roller Classification Kg/cm	**Voids Not Filled**		**Voids Partly Filled**	
	Max layer thickness (mm)	**Min No. of passes**	**Max layer thickness (mm)**	**Min No. of passes**
14 - 24	300	5	300	6
24 - 35	500	5	400	5
35 - 45	700	5	600	5
45 - 55	1000	5	800	4
> 55	1500	5	1000	4

An additional requirement shall be that the minimum mass on the vibrating drum shall be 4.5 tonnes.

R22.9.2.4 Blinding of Mechanical Interlock Layer.

When construction of an embankment changes from mechanical interlock layer method to compacted layer method, the top surface of the former layer shall be blinded with smaller stone to fill surface voids, and then a geotextile shall be placed over the surface. The geotextile shall comply with the requirements of Class B given in *Standard Specification R24 Geotextiles*, and shall have a minimum overlap of 500mm at each join.

Where the mechanical interlock layer method is used to construct an embankment up to the subgrade zone, the top layer shall be blinded with smaller stone to fill surface voids at the level of the bottom of the subgrade zone.

There shall be no additional payment for blinding of mechanical interlock layers, or for placement of geotextile on them.

R22.9.3 Sound Attenuation Mounds

Sound attenuation mounds shall be constructed at the location and dimensions shown on the drawings.

No specific treatment of the foundation of the sound attenuation mound is required.

All material used in the construction of the sound attenuation mound shall be free from rubbish or other deleterious matter. The Contractor may obtain material from either off-site borrow or excavation undertaken during the course of the works.

Each layer of material shall be of uniform thickness not exceeding 450 mm before compaction.

The maximum size of any rock pieces shall be 150mm.

The sound attenuation mound shall be compacted to a minimum characteristic dry density ratio of 90% of Standard Compaction.

R22.10 TREATMENT OF BATTERS AND TOPSOILING

R22.10.1 Earth Excavation Batter Treatment

For earth excavation batters, including benches, prone to erosion or sediment deposition the treatment shall be:

- finished with no vertical or near vertical marks. Batters shall have near horizontal grooves. The groves shall be of 300 mm centres and extend 50 mm into batter surface. The batters shall be topsoiled in accordance with this Specification and covered with an erosion control fabric or mesh
- for the purposes of this specification the fabric or mesh is classed as a Proprietary Product The Contractor shall provide evidence that all proprietary products used have demonstrated satisfactory field performance for a period of at least three (3) years. Such evidence shall include full details of the products properties
- the erosion control fabric or mesh shall be open to permit light penetration and growth of vegetation through the blanket
- if the earth excavation batters are completed outside the appropriate time for seeding, then the erosion control fabric or mesh shall be applied on its own until the optimum time for seeding.

R22.10.2 Embankment Batter Treatment

Embankment batters shall be topsoiled in accordance with this Specification.

R22.10.3 Topsoiling

Topsoil that is to be used for surfacing of batters, sound mounds, redundant road and other landscaping projects shall be free of weeds including seeds, or roots, and any extraneous matter with a major dimension greater than 50mm. Stones shall be less than 5% dry weight of the topsoil.

Topsoil shall be from the site (refer *Clauses R22.8.4 and R22.8.5*). Where there is insufficient topsoil available from the site it shall be imported from the local area.

Topsoil shall consist of friable sandy – loam with a light to medium texture with particle size as per *Table R22.6 - Topsoil particle size table (% passing by mass)*. Topsoil shall have a pH of between 5.5 and 6.0.

Topsoil from site stockpiles shall be tested for pH level prior to use. If the pH level is outside the above range it shall be treated to ensure compliance.

Topsoil shall be spread to a depth of:

Batters and redundant road	50 mm.
Planting areas	300 mm

Table R22.6 - Topsoil particle size table (% passing by mass)

AS sieve aperture	Medium Soil Texture
2.36	100
1.18	95 – 100
0.60	75 – 100
0.30	55 - 85
0.15	38 - 55
0.075	25 - 35
0.002	2 - 15

R22.11 MEASUREMENT AND PAYMENT

R22.11.1 Geotextile Separation Layer and Drainage Blankets

Payment for these layers shall be based on the rate per square metre of ground covered not the quantity of geotextile used, as quoted in the Schedule of Rates.

The rate shall include the cost of supply and placement of all materials. Any excavation required to accommodate their placement shall be paid for at the relevant excavation rate.

R22.11.2 Excavation

Further to *Specification G1.18*, when field measurement of excavation is undertaken, payment shall be for the solid volume measured from the surveyed levels, after clearing and grubbing, to the design perimeters. Excavation shall also include topsoil removed from under embankments and unstable material from under embankment foundations.

Excavation rates shall allow for excavation, loading and hauling to site embankment, to stockpile or to disposal. The rates shall also allow for trimming of batters and the base of excavations, and the construction of terraces specified in this Specification.

R22.11.3 Embankment

Further to *Specification G1.18*, when field measurement of embankment, including sound mounds, is undertaken, payment shall be for the solid volume, after compaction, measured from the surveyed levels to the design perimeters and from the foundation level to the lower level of the subgrade zone.

The rate for embankment shall include the preparation of the insitu embankment foundation materials, the supply, placing and compaction of materials in the foundation, construction of any terraces as described in this Specification, and the supply, placing and compaction of materials in embankments. The rate shall also include blinding and placement of geotextile on mechanical interlock layers where utilised.

Sound mounds shall be paid at the rate for embankments.

The rate for embankment and sound mounds shall also allow for trimming and grading the tops and sides to the required dimensions, and for maintaining the works in a sound condition.

R22.11.4 Local Existing Pavement Failure

Payment shall be based on the rate per square metre of pavement treated measured at finished surface level. This rate shall include cutting of existing seal, excavation to full pavement depth and disposal, supply and installation of sub soil drains, supply and compaction of new pavement material and sealing to match existing.

R22.11.5 Subgrade Replacement in Local Existing Pavement Failures

Payment for treatment of the subgrade zone in existing pavement failures shall be measured as the compacted in place volume determined from the formation area to a depth 200 mm below formation surface. This rate shall include excavation of existing material, disposal, supply and compaction of new subgrade material.

R22.11.6 Treatment of Redundant Road

Payment for treatment of redundant road sections shall be based on the area of scarified redundant road.

R22.11.7 Topsoiling

Payment for the supply and placing of topsoil shall be based on the tendered rate per square metre of surface area of topsoil.

R22.11.8 Batter Treatment

Payment for batter finishing and the supply and placement of erosion control material shall be per square metre of batter face.

R22.12 HOLD POINTS

Hold points identified in this specification are in *Table R22.7 – Hold Points*.

Table R22.7 – Hold Points

Reference	Hold Point	Nominated Work not to proceed	Evidence of Compliance
R22.5	Contractor's Earthworks Management Plan	Commencement of clearing or earthworks	Plan
R21, R72	Completion of adjacent fencing	Commencement of clearing or earthworks	Installation of Fencing
G10, R21, R22.5, R22.8	Installation of Environmental Site Protection Measures	Commencement of clearing or earthworks	Installation of measures in accordance with G10
R22.8	Stripping of topsoil	Commencement of stripping	Topsoil management plan
R22.8.5	Importation of embankment material	Importation of embankment material	Confirmation of site quantities
R22.9.1	Embankment foundation preparation	Commencement of stripping	Confirmation of site quantities
R22.10	Treatment of batters	Placement of erosion control fabric or mesh or topsoil	Details of erosion control fabric or mesh and topsoil test results

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