**R03 SUPPLY OF PIPES AND CULVERTS**

***1. ALUMINIUM PIPES***

*Corrugated aluminium pipe culverts must be Helcor or equivalent.*

*The material must be "Alclad 3004-H34" in accordance with AASHTO M197-82 (1986) "Clad Aluminium Alloy Sheets for Culverts and Underdrains". Raw material coil width must be 650 mm or greater to maximise lock seam spacing.*

*Manufacture must be in accordance with AASHTO M196-84 - "Corrugated Aluminium Alloy Culverts and Underdrains" to the tolerances shown in AS 1761 "Helical Lock-Seam Corrugated Steel Pipes", and incorporate a staked double offset, lock-seam joint.*

*The wall thickness and corrugations must be as follows:*

|  |  |  |  |
| --- | --- | --- | --- |
| ***DIAMETER*** | ***WALL THICKNESS*** | ***CORRUGATION PITCH*** | ***CORRUGATION DEPTH*** |
| *less than 1 050 mm* | *1.5 mm* | *68 mm* | *13 mm* |
| *1 050 mm or greater* | *2.0 mm* | *125 mm* | *25 mm* |

*End treatment must be rerolled/unrerolled. The banding treatment must be corrugated/semi-corrugated/dimple banding. Banding sleeves must/must not be used.*

*Dissimilar metals must not be in direct contact with the pipes.*

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**R10 EARTHWORKS**

*The Specifier needs to consider the following when compiling the CSR for this Part:*

* *Will fill material be sourced from within the Site, if so what are its properties and what classification does it fall into?*
* *If fill material is sourced within the Site what is the estimated mass haul quantities? (discussion with Estimator may be required here to determine how the Estimate figure was constructed).*
* *Is there sufficient geotechnical information available to ascertain the quality of all the material that is intended to be used within the Site? If not, then additional geotechnical testing should be carried out.*

***RESTRICTIONS ON USE OF MATERIAL***

*Specify restrictions eg:*

*Only Type A Material must be used within 1.0 m of the underside of the pavement.*

*Type D Material must not be used at any point below the pavement.*

*Refer to Sketch………….*

***TOPSOIL STRIPPING***

*Specifier to advise if not 100 mm. (refer 210.2.3)*

***BACKFILL TO KERB AND GUTTER***

*Detail material for backfill to kerb and gutter.*

***TREATMENT OF AREAS OF EXISTING PAVEMENT TO BE ABANDONED***

*Certain areas of the existing pavement as shown on the Drawings must have the existing asphalt cold planed.*

*Cold planed and edge planed asphalt must be stockpiled and used in lieu of PM3/20 material where specified for base for block paving in medians and footpaths.*

*REHABILITATION:*

1. *Rip to a minimum depth of 100 mm and ensure that the seal is broken down to 75 mm maximum particle size.*
2. *Regrade areas such that the resulting batters are no steeper than 6 horizontal to 1 vertical. Areas must be free draining.*
3. *topsoil must be spread in accordance with Clause 12 "Topsoil and Mulch".*

***TREATMENT OF EXCAVATED MATERIAL***

*Excavated material must be used as fill in the works in accordance with Sketch DS210A**. Surplus excavated material must be stockpiled as follows:*

 *Specify requirements for stockpiling of material.*

*Surplus excavated material, other than cold planed material, must be removed from the site and disposed of by the Contractor. The Contractor must nominate a dump site for disposal of surplus or waste material (clean fill; asphalt; concrete; asbestos or contaminated material) in the Quality Plan. The dump site must be certified for the type of material to be dumped.*

*Cold planed asphalt and edged planed asphalt must be stockpiled and used in lieu of PM3/20 material where specified for base for block paving in medians and footpaths. The Contractor must program this work in such a way that all cold planed material is used in the works.*

***EXCAVATION IN ROCK***

*Include here details on excavation in rock if not as specified in Clause R10.8.3.*

***BORROW PITS***

*Include requirements for treatment of borrow pits.*

***MISCELLANEOUS EARTHWORKS***

*Special verge treatment must consist of a minimum of 150 mm of PM3/20 20 mm Class B Pavement Material overlying Type A Material in accordance with Sketch DS210A and compacted to not less than 95%. The minimum frequency of compaction testing must be one test per 200 linear metre.*

***ADDITIONAL INFORMATION FOR EARTHWORKS***

*Include here any information about existing materials or conditions that are not in the Materials Earthworks Report(s) included in the Appendices.*

***PLACEMENT AND COMPACTION OF GENERAL FILL MATERIAL***

*General Fill must comply with the following requirements:*

|  |  |  |
| --- | --- | --- |
| ***MATERIAL CLASSIFICATION*** | ***GENERAL FILL 1 (GF1)*** | ***GENERAL FILL 2 (GF2)*** |
| ***Maximum allowable Weighted Plasticity Index (WPI)*** | *3000* | *unlimited* |
| ***Maximum allowable Ipt (%)*** | *1.7* | *unlimited* |
| ***Grading: % passing 37.5 mm sieve*** | *80 - 100* | *80 - 100* |
| ***Level of compaction(Standard Compaction to AS 1289.5.1.1)*** | *95% minimum* *98% maximum*  | *92% minimum* *98% maximum* |
| ***Range of Placement Moisture Content*** | *OMC to OMC-3%* | *OMC to OMC-3%* |

***EXISTING PAVEMENT MATERIAL***

*Information regarding existing pavement.*

***UNSUITABLE MATERIAL***

*Information regarding any known unsuitable material.*

***EARTHWORKS QUANTITIES (only include if mass haul quantities provided)***

*Mass/Haul quantities will be provided by the Principal. Cut and fill volumes are calculated on the basis of solid measurement between the final design surface and the natural surface.*

*No allowance has been made in the volume quantities for compaction of subgrade, removal of topsoil, clearing and grubbing, bulking, pavement volume or respreading of topsoil.*

***Respreading of Topsoil***

*Topsoil must be respread to a thickness of 100 mm, with a tolerance of +/-25 mm.*

***IMPORTED TOPSOIL***

*The texture of the imported topsoil blend must be a sandy loam capable of being handled when moist, but lacking cohesion so that it will fall apart easily when dry. The topsoil must consist of approximately 30% loam, 50% sand, 10% clay and 10% organic matter and must be free of debris, stones, weeds, roots or other deleterious materials, plant pathogens and other pests.*

*Evidence of the source of imported topsoil must be provided.*

***SPREADING OF MULCH***

*Mulch must be respread to a thickness of 100 mm, with a tolerance of  50 mm.*

*Specify any restrictions, e.g. weed infested mulch to be burnt and not spread on batters.*

**EARTHWORKS DETAILS- CUT LOCATIONS - R10-1**

Backfill

Footpath

400

Back of Kerb

Limit of excavation

350

500

Median Infill or Topsoil

Backfill

Limit of

Excavation

Base

Subbase

Base

Subbase

NOTES:

1. Not to scale. Dimensions shown are in millimetres.

2. For footpath and median treatment refer to Drawings and Specification.

3. At locations of no median kerb, or kerb and water table, subbase must extend 500 mm beyond edge of seal.

4. Kerb and water table and median profile for illustration only.

5 Refer to Specification for backfill details.

6. Refer to Specification for Pavement details.

7. Refer to Specification for Batter Treatment details.

8. Indicates where control given in Geometric Details.

Pavement

400

500

Median Treatment

Footpath Treatment

Quarry waste to PM11

or cold planed material.

Slopes are1:1

Type B

Material

Slope 1:1

Type A Material

Back of Kerb

Natural Surface

Batters to be covered with topsoil as specified

in **Contract Specific Requirements**.

Type B

Material

**EARTHWORKS DETAILS – FILL LOCATIONS - R10-2**

NOTES:

1. Not to scale.

2. For footpath and median treatment refer to Drawings and Specification.

3. At locations of no median kerb, or kerb and water table, subbase must extend 500 mm beyond edge of seal.

4. Kerb and Gutter detail for illustration only.

5. Refer to specification for backfill details.

6. Indicates where control given in Geometric Details.

Natural Surface

Pavement

Median Treatment

Footpath Treatment

Batters to be covered with topsoil as specified in

**Detail Schedule 210C**.

Quarry waste to PM11

or cold planed material.

**EARTHWORK DETAILS CUT & FILL LOCATIONS - R10-3**

Type B Fill

IN String

IN String

Pavement

**Placement of Material - R10-4**

Fill Locations

**Note:**

1. Sketch for illustration only, not to scale.

2. Refer to Specification for pavement details.

3. Refer to Specification for fill details.

4. Refer to Specification for topsoil details.

NV String

NB String

NB String

NV String

Cut Locations

Verge drain treatment as per Specification

Verge drain treatment as per Specification

NV String

NB String

NB String

NV String

NS String

NS String

ND String

ND String

**R20 PAVEMENT**

***PAVEMENT MATCHING TREATMENT***

*State job specific requirements here and/or prepare Sketch CSRR20 to show requirements as specified in Clause R20.3 "Pavement Matching Treatment".*

***PAVEMENT TREATMENT UNDER KERB AND OR GUTTER***

*Pavement under Kerb and Getter must be constructed in accordance with Sketch R20-1/2.*

***JOINT PERFORMANCE REQUIREMENT***

*That part of new pavement located within 300 mm of the existing pavement must not rut more than the following when measured under a 1.2 m straight edge, placed transverse to the joint:*

* 1. *5/10 mm at Practical Completion, and*
	2. *10/15 mm at 2 months prior to the expiry of the Defects Liability Period.*

*The new pavement must be completely free draining.*

*Th*e Contractor warrants that the joint will comply with the above performance requirements during the defects liability period, unless the Contractor can demonstrate that any rutting is attributable to:

* 1. *deformation in the subgrade, or*
	2. *failure of the seal to waterproof the road pavement,*

*and the subgrade deformation or seal failure is not due to the Contractor’s negligence or use of inappropriate methods.*

***PAVEMENT MARKING AND ROADSIDE FURNITURE***

*During construction the Contractor must remove all edge line Reflectorised Raised Pavement Markers and repair any damage caused to the sealed surface. All roadside furniture removed during the works must be reinstated.*

**INSERT PAVEMENT DETAILS HERE**

Kerb and Gutter Abutting New Pavement - R20-1

**NOTE:**

1. Drawing not to scale. Diagram is for illustration only.

2. All dimensions in millimetres.

3. Kerb and gutter may need to be recessed into subbase to achieve required cross section. Refer to Specification for details.

4. Indicates where control given in Geometric Details.

400

Subbase

Asphalt Wearing Course

Refer to Specification

For Backfill

Asphalt Wearing Course

Base

Refer to Specification for Backfill

Refer Note 3

400

Open Graded Asphalt Wearing Course

600

Asphalt Base

Subbase

See Note 3

Open Graded AC

400

400 along straights

500 along curves

Footpath

AC Wearing Course

Backfill

Existing Pavement

Asphalt Infill

Kerb and Gutter footing (150 mm N10)

Saw cut existing pavement

AC Wearing Course

400 along straights

500 along curves

400

Open Graded AC

Footpath

Levelling Course

600

Backfill

Asphalt Infill

Existing Pavement

Kerb and Gutter footing (150 mm N10)

Saw cut existing pavement

Open Graded AC

**NOTE:**

1. Drawing not to scale.

2. All dimensions in millimetres.

3. Diagram for illustration only.

4. Refer to Specification for details of:

Backfill

Pavement

Asphalt infill

Kerb and Gutter footing.

5.  Indicates where control given in Geometric Details.

Kerb and Gutter Abutting Existing Pavement - R20-2

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**R23 INSITU Stabilised Pavement**

***1. NATURE OF GROUND***

*The materials to be stabilised consist of 180 mm depth of pavement comprising a 50 mm limestone rubble overlying a sandy clay subgrade. The parking lanes to be stabilised consist of identical configurations and materials.*

***2. SPREADING OF CEMENT***

*Where the depth of stabilisation exceeds 250 mm the operation must be undertaken using two passes and double mixing.*

*Spreading of cement must be overlapped longitudinally by 300 mm.*

*The spread rate is based on an assumed dry density of 2 032 kg per cubic metre.*

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**R24 CONSTRUCTION OF FOAMED BITUMEN STABILISED PAVEMENT**

***MIX DESIGN PARAMETERS SUMMARY***

***Example from Sturt Highways***

***RN7200 Sturt Highway***

***MM 88.0 – 91.00***

|  |  |
| --- | --- |
| *Nominated bitumen to be used* | *Class 170* |
| *Nominal percentage of bituminous binder by mass:* | *3.5 %* |
| *Nominated supplementary binder to be used* | *Hydrated Lime* |
| *Nominal percentage of supplementary binder by mass* | *2 %* |
| *Nominated target moisture content* | *To be determined by Contractor %* |
| *Nominated additional granular material to be used* | *Not applicable* |
| *Quantity additional granular material to be used* | *Not applicable* |
| *Nominated RAP material to be used* | *Not applicable* |
| *Quantity RAP material to be used* | *Not applicable* |
| *Depth of compacted layer(s) to be constructed:**Foamed Bitumen Stabilised Subbase*  | *320 mm + 20 mm construction tolerance* |
| *Temporary Surfacing Course* | *10mm C170 Sprayed seal*  |
| *Maximum period between completion of pavement base and application of surfacing:*  | *7 days* |

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**R26DA DESIGN & APPLICATION OF SPRAYED BITUMINOUS SURFACING**

**1. TRAFFIC DATA**

Work to be performed under Part R26DA has been identified in Appendix 1 “Work Summary”. Traffic data including Annual Average Daily Traffic (AADT) and percentage commercial vehicles (%CV) is as follows:



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**R33 DESIGN OF SPRAY SEALS**

***PARAMETERS FOR SPRAY SEAL DESIGN***

*Annual Average Daily Traffic*

*% Commercial Vehicles*

*Noise restrictions (eg single 16 mm not allowed near residential buildings? Seals within residential town streets are to be 10/5, or 14/7)*

*Possible short increases in traffic volumes such as during grain harvest, local field days, local festivals, etc, that may occur early in the life of a seal or reseal, which should be allowed for by an increase in the design traffic volume*

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**R35 SURFACE CHARACTERISTICS**

1. ***ROUGHNESS***
	1. ***Maximum Roughness Levels***

 *For finished wearing courses on New Works, the following must apply:*

|  |  |  |
| --- | --- | --- |
| ***LOCATION*** | ***STAGE*** | ***100 m SECTION AVERAGE ROUGHNESS*** ***IRI m/km [NRM c/km]*** |
| ***Target Value*** | ***Marginal*** | ***Unacceptable*** |
| *Motorway / Freeway / Expressway & Ramps* | *Practical Completion* | *≤ 1.0 [25]* | *1.1 to 1.2* | *> 1.2 [30]* |
| *2 Years after Practical Completion* | *-* | *-* | *> 1.4 [35]* |
| *End DLP(1)* | *-* | *-* | *> 1.4 [35]* |
| *High Speed Environment* *(> 70 km/hr)* | *Practical Completion* | *≤ 1.4 [35]* | *1.5 to 1.6* | *> 1.6 [40]* |
| *2 Years after Practical Completion* | *-* | *-* | *> 1.9 [50]* |
| *End DLP* | *-* | *-* | *> 1.9 [50]* |
| *Low Speed Environment* *(≤ 70 km/hr)* | *Practical Completion* | *≤ 1.6 [40]* | *1.7 to 1.9* | *> 1.9 [50]* |
| *2 Years after Practical Completion* | *-* | *-* | *> 2.3 [60]* |
| *End DLP* | *-* | *-* | *> 2.3 [60]* |
| *Action / Outcome* | *None**(acceptable)* | *7% payment penalty for each 0.1 m/km IRI above Target Value(2)* | *Rework(3)* |
| *Notes:**1) DLP = Defects Liability Period.**2) For example, if Motorway roughness is 1.1 IRI m/km at PC, then a payment penalty of 7% would apply. If High Speed Environment roughness is 1.7 IRI at PC then payment penalty of 14% would apply.* *3) Rework must be undertaken at the Contractor’s full cost and comprise plane & reinstatement of the wearing course as a minimum, and of sufficient scope to comply with all requirements of this Part.* |

* 1. ***Minimum Testing Frequency after Practical Completeness***

*The surface roughness must be tested and reported at Practical Completion, at 2 years after Practical Completion and at the end of the Defects Liability Period.*

1. ***TEXTURE***
	1. ***Method of Assessment***

*The texture depth must be measured by a Class 1 texture measuring device, in accordance with DPTI Test Method TP352. The texture depth must be measured in the outer wheelpath and converted to equivalent sand patch texture depth (SPT).*

*The texture depth must be measured in the wheel path of all lanes and ramps and reported at 100 m intervals. Lengths less than 100 m must be included in the previous adjacent 100 m length.*

* 1. ***Minimum Texture Levels***

*For finished wearing courses on New Works, the following must apply:*

|  |  |  |
| --- | --- | --- |
| ***WEARING*** ***COURSE*** | ***STAGE*** | ***100 M SECTION MEAN TEXTURE DEPTH******mmSPT*** |
| ***Target Value*** | ***Marginal*** | ***Unacceptable*** |
| *Open Graded Asphalt, OG14* | *Practical Completion* | *≥ 1.2* | *1.1 to 1.0* | *< 1.0* |
| *2 Years after Practical Completion* | *-* | *-* | *< 0.9* |
| *End DLP(1)* | *-* | *-* | *< 0.9* |
| *Stone Mastic Asphalt, SMA10* | *Practical Completion* | *≥ 1.0* | *0.9 to 0.7* | *< 0.7* |
| *2 Years after Practical Completion* | *-* | *-* | *< 0.7* |
| *End DLP* | *-* | *-* | *< 0.7* |
| *Dense Mix Asphalt, AC10* | *Practical Completion* | *≥ 0.5* | *-* | *≤ 0.4* |
| *2 Years after Practical Completion* | *-* | *-* | *≤ 0.4* |
| *End DLP* | *-* | *-* | *≤ 0.4* |
| *Action / Outcome* | *None**(acceptable)* | *5% payment penalty for each 0.1 mmSPT below Target Value (2)* | *Rework(3)* |
| *Notes:**1) DLP = Defects Liability Period.**2) For example, if Open Graded Asphalt mean texture is 1.0 mmSPT at PC, then a payment penalty of 10% would apply (similarly, 5% penalty for 1.1 mmSPT). If Stone Mastic Asphalt mean* *texture is 0.8 mmSPT at PC then payment penalty of 10% would apply.**3) Rework must be undertaken at the Contractor’s full cost and comprise plane & reinstatement of the wearing course as a minimum, and of sufficient scope to comply with all requirements of this Part.* |

* 1. ***Minimum Testing Frequency after Practical Completeness***

*The texture depth must be tested and reported to the Superintendent at Practical Completion, at 2 years after Practical Completion and at the end of the Defects Liability Period. Texture testing must be undertaken in one continuous run over the length of the project.*

1. ***LANE RUTTING***
	1. ***Method of Assessment***

*Lane rutting is based on the maximum rut depth under a simulated 3m straight edge and must be measured by a Class 2 or higher profile measuring device (Guidelines for Road Condition Monitoring, Part 2 – Pavement Rutting, Draft Report, June 2000). Lane rutting must be measured on all Lanes and Ramps in both Wheel Paths and reported every 100 m.*

* 1. ***Maximum Rutting Levels***

*For finished wearing courses on New Works, the following must apply:*

|  |  |  |
| --- | --- | --- |
| ***LOCATION*** | ***STAGE*** | ***100 M SECTION AVERAGE LANE RUTTING******mm*** |
| ***Target Value*** | ***Marginal*** | ***Unacceptable*** |
| *All road pavements* | *Practical Completion* | *≤ 4* | *-* | *> 5* |
| *2 Years after Practical Completion* | *-* | *-* | *> 7* |
| *End DLP* | *-* | *-* | *> 7* |
| *Action / Outcome* | *None**(acceptable)* | *-* | *Rework(2)* |
| *Notes:**1) DLP = Defects Liability Period.**2) Rework must be undertaken at the Contractor’s full cost and comprise plane & reinstatement of the wearing course as a minimum, and of sufficient scope to comply with all requirements of this Part.* |

* 1. ***Minimum Testing Frequency after Practical Completeness***

*The minimum frequency for lane rutting testing and reporting must be at Practical Completion, 2 years after Practical Completion, and at the end of the Defects Liability Period.*

1. ***SKID RESISTANCE***
	1. ***Method of Assessment***

*The skid resistance must be measured in the outer wheel path in accordance with DPTI Test Method TP344 and reported at 100 m intervals. Lengths less than 100 m must be included in the previous adjacent 100 m length.*

* 1. ***Minimum Skid Resistance Levels***

*Skid Resistance levels on the finished wearing courses for the main alignment and ramps must exceed the recommended investigatory Skid resistance Levels determined in accordance with DPTI “Technical Note 24 - Recommended Investigatory Levels for Skid Resistance and Texture”.*

*Where the skid resistance is below these values the contractor must identify the cause and propose suitable treatments. These treatments require the Superintendants approval and are to be implemented at the Contractor’s cost.*

*The skid resistance must be tested and reported to the Superintendent at the following frequencies:*

|  |  |
| --- | --- |
| ***LOCATION*** | ***Testing Frequency for Wearing Course*** |
| ***Practical Completion*** | ***Opened to Public(1)*** | ***Early Life Testing (2)*** | ***Annually(3)*** |
| *Motorway / Freeway / Expressway & Ramps* | *yes* | *yes* | *yes* | *yes* |
| *High Speed Environment* *(> 70 km/hr)* | *yes* | *-* | *-* | *yes* |
| *Low Speed Environment* *(≤ 70 km/hr)* | *yes* | *-* | *-* | *-* |
| *Notes:**1. Once opened to the public (date to be recorded).**2. Early Life Testing is required at a minimum frequency of 2 and 4 weeks after opening to public. Additional testing may be required to prove achievement of recommended investigatory levels. E.g. SMA and OG wearing course can exhibit low skid resistance in early life until the binder has worn off the aggregate surface.**3. Annually therein, as close as practical to the anniversary date recorded for the public opening test date, until the end of the Defects Liability Period.* |

1. ***CRACKING EXTENT***
	1. ***Assessment***

*Cracking extent must be determined via visual inspection and presented on a scaled graphical pavement condition survey, utilising the distress categories presented in the “Austroads Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design - Appendix A – Identification, Causes and Treatment of Visual Distress”.*

*The extent of cracking must be reported at Practical Completion, 2 years after Practical Completion, and at the end of the Defects Liability Period.*

* 1. ***Maximum Cracking Levels***

*Cracking must be assessed through a joint site inspection between the Superintendent and Contractor’s representatives. There must be no cracking in the pavement at Practical Completion or at the end of the Defects Liability Period.*

*Where cracking is present, the contractor must undertake treatments appropriate to the pavement type and cracking type, severity, location and extent to ensure realisation of the full pavement design life. All treatments require the Superintendants approval and are to be implemented at the Contractor’s cost.*

1. ***MULTIPLE SURFACE CHARACTERISTIC FAILURES***

*In the event that more than one of the outlined surface characteristics are not within the required limits at Practical Completion, the Contractor must, at the Contractor’s cost, plane out and replace the wearing course in that section. Such replacement wearing course must conform to all the requirements of this Specification and be subject to this Clause.*

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**R36 CONSTRUCTION OF SEALED SHOULDERS**

*Shoulder crossfalls must be as follows:*

|  |  |  |
| --- | --- | --- |
| *LOCATION* | *CROSSFALL* | *TOLERANCE* |
| *Straights* | *7 % or same as crossfall of adjacent pavement* | *+ 0 %, - 1 %* |
| *Outside of Curve* | *Same as crossfall of adjacent pavement* | *+ 2 %, - 0 %* |
| *Inside of Curve* | *Same as crossfall of adjacent pavement* | *+ 0 %, - 2 %* |

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**R42 STEEL BEAM SAFETY BARRIERS**

1. ***PAYMENT FOR ROCK DRILLING***

*Where installation of posts is prevented due to rock, rock drilling equipment must be used to achieve the required depth. Rock drilling will be paid for at Schedule of Rates.*

1. ***DAMAGE TO POSTS DUE TO ROCK***

*Where the Contractor can show that a post has been damaged beyond repair whilst driving in rock the Principal will pay for the replacement post at cost. The post must be shown to the Superintendent before payment is made.*

1. ***CRANKED POSTS***

*Separate payment will be made for the installation of Cranked Posts.*

1. ***PRESENCE OF OBSTRUCTIONS***

*Where the Contractor cannot install a post due to the presence of an obstruction, vide Clause 3.7, the Contractor must not install the safety barrier in a new position unless directed by the Superintendent.*

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**R43 WIRE ROPE SAFETY BARRIERS**

1. ***POST COLOUR AND FINISH***

*The colour of posts must be powder coated Heritage Green (or equivalent dark green colour) with two white posts installed on both sides of all verge access and emergency phone openings.*

1. ***PAYMENT FOR ROCK DRILLING***

*Where installation of posts is prevented due to rock, rock drilling equipment must be used to achieve the required depth. Rock drilling will be paid for at Schedule of Rates.*

1. ***EXTENT OF WIRE ROPE SAFETY BARRIER***

*The approximate lengths of wire rope safety fence stated must be used as a guide only. Final details regarding wire rope safety fence length, location, emergency access/phone treatments and terminal treatments must be as marked out by the Superintendent.*

*Additional requirements for Proprietary Systems*

1. ***INGAL FLEXFENCE***

*Post footings must be not less than 750 mm deep.*

*The Deflection post must have a concrete pad with the minimum dimension 1.0 m square and 150 mm deep, reinforced with SL81 mesh or equivalent.*

1. ***BRIFEN SAFETY BARRIER***

*Post footings must be not less than 950 mm deep.*

*The top and sides of the anchor block must be reinforced with SL81 mesh or equivalent.*

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**R44 CONCRETE SAFETY BARRIERS**

*\_\_\_\_\_\_\_\_\_\_\_\_*

**R46 PAVEMENT MARKING**

1. ***TIMING CONSTRAINTS ON APPLICATION OF EACH COAT OF PAINT***

*Application of the first coat of paint must be carried out within 7 days after a section of sealed road has been opened to traffic.*

*Application of the second coat of paint must be 4 weeks after the section of road surfaced with a seal has been opened to traffic. All Raised Pavement Markers and Pavement Bars must be installed at this time.*

1. ***ADDITIONAL REQUIREMENTS***

*The Principal will record details of existing pavement marking, including the location of holding lines and stop lines and raised pavement markers. These details are provided as sketches and attached to this Specification.*

1. ***LANE MARKING DETAILS***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***AE No.*** | ***Road No.*** | ***Road Name*** | ***Road Description*** | ***MMP******Start*** | ***MMP******End*** | ***Lane Width (m)*** |
| *228* | *8832* | *Mt.Gambier –Pt.MacDonnell* | *Mt.Gambier Township* | *3.298* | *3.650* | *3.4* |
| *230* | *8000* | *Riddoch Highway* | *Penola – Nangwarry* | *164.000* | *164.337* | *3.4* |
| *234* | *4571* | *White Hill Entry* | *White Hill Freeway Interchange, M/Bridge* | *0.0460* | *0.697* | *3.5* |

1. ***RAISED PAVEMENT MARKER LOCATIONS***

*Raised Pavement Markers must be installed in accordance with the DPTI Pavement Marking Manual at the following sites:*

* *Centreline and edge lines at AE’s 228, 230, 233, 234, 235, 239, 243, 246, 250, 252, 253, 254, 263 – 268 inc, 271, 275, 276 and 277.*
* *Centreline only at AE’s 251.*
1. ***GENERAL NOTES***

*1. Refer to relevant Sketches/Drawings for further information.*

*2. Pavement marking is not required at AE’s 255 – 262 inc, 272, 273 and 274.*

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**R49 SIGN INSTALLATION**

***1. CIRCULAR HOLLOW SUPPORTS***

*Specifier must seek clarification from TASS regarding colour of supports for directional signs. Some are:*

* *G61 as defined by AS 2700. (This is the default in clause R48.5.3.*
* *Hot dip galvanized colour.*

Supports in coa*stal areas or saline environs may be required to be galvanised and coloured as above.*

*In some locations the installation of large signs may require Technical Regulator sign off. The Specifier must ensure that locations have been checked on site and that approval from the relevant Technical Regualtor has been obtained.*

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**R50 LIGHTING COMPONENTS**

*Eg Heritage poles.*

\_\_\_\_\_\_\_\_\_

**R52 LIGHTING**

*Temporary overhead supply points will be provided on stobie poles adjacent to Supply Points ........ .... and ...... to enable connections necessary prior to completion of SA POWER NETWORK undergrounding works. (Refer Clause G10.3 "Constraints").*

*If required, temporary service points must be located on stobie poles.*

*Payment for removal of the concrete bases and backfilling of resulting holes will be at Daywork rates.*

*The Contractor must supply and install uplighting as detailed on drawing No. …….. sheet………*

*The Contractor must supply and install underbridge cycleway lighting as detailed on Drawing No……….. sheet ……….*

*Fluorescent lamp fittings with lamps and mounting brackets must be type ………….., ….W*

*Wiring must be carried out such that lamps are continually on.*

*Fixing must be by 6 Hilti M6x43/5 tamper proof stainless steel screws.*

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**R53 CONDUITS AND PITS**

***INSTALLATION OF OTHER CONDUITS***

*The Contractor must trench for, install and backfill Electric Power Authority, Telecommunication and DPTI conduits in the locations and to the layouts shown on Sketch R53A. At approaches to the bridge deck where laying of conduits to less than 750 mm cover is necessary, the conduits must be concrete encased as shown on Sketch R53A.*

***LARGE PITS***

*Specify if required.*

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**R58 CONSUMER MAINS ELECTRICAL POWER DISTRIBUTION**

***1. SUPPLY OF MATERIALS***

*The Principal will supply an 11 kV padmount transformer.*

***2. DISPOSAL OF REDUNDANT MATERIALS***

*All redundant poles and wires must be removed and disposed of by the Contractor in accordance with the requirements of the Environmental Protection Act.*

*or*

*All redundant poles and wires must be removed and transported by the Contractor to the SA Power Network Depot at ...............*

***3. SCHEDULE OF CONSUMER ELECTRICAL SERVICES***

*The following schedule lists the consumer electrical requirements at 18 sites for work in relation to the PLEC undergrounding of electricity supply.*

|  |  |  |  |
| --- | --- | --- | --- |
| *NO* | *TYPE* | *OWNER* | *ADDRESS* |

|  |  |  |  |
| --- | --- | --- | --- |
| *1.* | *Commercial* | *Not known**(Electrical Sign)* | *Cnr. Daniel Avenue* |

Relocate existing Three-phase 415 volt 4-wire consumers mains to *SA Power Network power* service fuse box located on *repositioned ‘Stobie’ pole.*

*Adequate mechanical protection to be provided for the wiring system in accordance with AS 3000 and SA Power Network requirements.*

|  |  |  |  |
| --- | --- | --- | --- |
| ***2.*** | ***Domestic*** | ***Not known*** | ***20 Port Wakefield Road*** |

*Excavate and install new* ***Three-phase 415 volt 4-wire 16 millimetre squared,*** *consumers mains from SA Power Network power fused service pit to existing meter box.*

*Adequate mechanical protection to be provided for the wiring system in accordance with AS 3000 and SA Power Network power requirements.*

*Upgrade main earthing system to comply with AS 3000.*

*SA Power Network power to leave existing ‘Stobie’ pole on the property, but have agreed to remove the ‘top section’.*

*SA Power Network power representative has agreed to advise the customer on the suitability of the ‘meter box’ location.*

|  |  |  |  |
| --- | --- | --- | --- |
| ***3.*** | ***Rural Property*** | ***Not known*** | ***22 Port Wakefield Road*** |

*Excavate and install a* ***Single-phase 240 volt 2-wire 16 millimetre squared,*** *consumers mains from SA Power Network power fused service pit to the existing meter box.*

*Adequate mechanical protection to be provided for the wiring system in accordance with AS 3000 and SA Power Network power requirements.*

*Upgrade main earthing system to comply with AS 3000.*

|  |  |  |  |
| --- | --- | --- | --- |
| ***4.*** | ***Domestic*** | ***Not known*** | ***Lot ? Port Wakefield Road*** |

*Provide* ***underground bore type*** *‘excavation’ between SA Power Network power fused service pit to a suitable point below the existing meter box.*

*Install a* ***Two-phase 415 volt 3-wire 16 millimetre squared,*** *consumers mains from SA Power Network power fused service pit, to the existing SA Power Network power meter position.*

*Adequate mechanical protection to be provided for the wiring system in accordance with AS 3000 and SA Power Network power requirements.*

*Upgrade main earthing system to comply with AS 3000.*

***Note:*** *The property owners have expressed an interest to have a 3-phase 415 volt supply, however this aspect is not part of the Contract, and can be negotiated with the owner as an additional cost to be borne by them.*

|  |  |  |  |
| --- | --- | --- | --- |
| ***5.*** | ***Domestic*** | ***Pettit*** | ***Lot 21 Port Wakefield Road*** |

*Provide* ***underground bore type*** *‘excavation’ between SA Power Network power fused service pit to a suitable point below the existing meter box/ switchboard.*

*Install a* ***Single-phase 240 volt 2-wire 16 millimetre squared,*** *consumers mains from the SA Power Network service pit to the existing SA Power Network power meter position.*

*Adequate mechanical protection to be provided for the wiring system in accordance with AS 3000 and SA Power Network power Requirements.*

*Upgrade main earthing system to comply with AS 3000.*

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**R82 GABIONS, RENO MATTRESSES AND MESH PANELS**

***1. BACKFILL***

*Backfill material must be compacted to not less than 95% and l must conform to the following:*

1. *Maximum particle size must be 75 mm.*
2. *Not more than 15% must be finer than 75 microns.*
3. *pH must be between 6 and 12.*
4. *Resistivity must be more than 5 000 ohm.cm or between 1 000 and 5 000 ohm.cm where the concentration of chloride is less than 200 ppm and sulphate content is less than 1 000 ppm.*
5. *A full range of particle sizes must be present.*

**2. INSTALLATION**

The surface on which mattresses are to be placed must be shaped and compacted to 95%.

**3. WIRE DIAMETERS**

The minimum wire diameters must be:

* Gabions 2.5 mm
* Mattresses 2.0 mm
* Mesh panels 2.5 mm
* Selvedges 3.4 mm
* Lacing wire 2.2 mm.

**4. CEMENT TREATED RUBBLE SURFACE DRAIN**

The Contractor must construct a cement treated rubble surface drain at the gabion retaining wall at chainage 575-594. The cement/rubble content must be 5%. The drain must be kept continuously moist for 5 days after being constructed.

***5. MESH***

*Mesh must be galvanised.*

***6. HEAL DRAIN***

*Further to the requirements of Clause 200.12 "Subsoil Drainage", the following must apply to the heal drain at chainage 3480:*

 *The 10 mm aggregate must be clean, hard, durable and must conform to the following grading:*

|  |  |
| --- | --- |
| ***GRADING SIEVE SIZE*** | ***% PASSING*** |
| *13.2* | *100* |
| *9.5* | *85-100* |
| *6.7* | *0-15* |
| *1.18* | *0-1* |

 *The Los Angeles Value must be 30 maximum.*

*The length of the drain not backfilled with 10 mm aggregate must be bedded on 50 mm of Sa‑C Type C Sand and backfilled to 100 mm above the top of the conduit with Sand, Type C, compacted to 90%.*

***7. GEOTEXTILE***

*Notwithstanding Clause 262.4 "Installation", geotextile is required under reno mattresses only.*

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**R84 SECONDARY PAVING**

***1. PAVING BLOCKS***

*Block paving must be as follows:*

*(a) Footpaths*

*Amatek "Uni-Pave" (red), 80 mm thickness, or similar and approved.*

*Openings in the paving (1 m x 1 m) must be left for future tree plantings as shown on the Drawings. Refer Clause 260.5.2. "Laying Paving Units".*

*(b) Property Driveways*

*........................................... mm thickness, or similar approved.*

*(c) Egress and Parking Bays*

*........................................... mm thickness, or similar approved.*

*(d) Median and Traffic Island Infill*

*........................................... mm thickness, or similar approved.*

***2. ASPHALT***

*EXAMPLE:*

 *Bituminous Treated Sand and Cold Planed Asphalt*

*Where shown on the Drawings, medians and traffic islands must be filled with cold planed asphalt as defined in Detail Schedule 210H "Cold Planing", overlaid with Sa‑C Type C Sand with the addition of 3% bitumen (i.e. Sa‑C B3). The minimum layer thickness of the cold planed asphalt must be 90 mm and the minimum layer thickness of the bitumen treated sand must be 50 mm.*

*If sufficient cold planed asphalt is not available, PM3/20, 20 mm Class 3 Pavement Material must be used and must be placed at OMC.*

*Each layer must be compacted using 3 passes of a vibrating plate compactor (Wacker Model BPU 3345 or equivalent) or a 3 tonne vibrating roller. Notwithstanding this, the surface must be shaped and compacted to produce a tight dense surface.*

*The surface of the infill must be shaped such that free water will drain to the top of the kerb.*

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**R85 GEOTEXTILES**

|  |  |
| --- | --- |
| ***Geotextile Application (Table 5)*** | ***Site Specific Details*** |
| *G1* | *Geotextile used under / within embankments for separation function.* | *Maximum nominal**Fill stone size (D85):. . . . . . . . . .mm* *Site subgrade CBR: . . . . . . . . . . . . .**Site soil type: Granular / Cohesive**(delete whichever is not applicable)* |
| *G2**Note* | *Geotextiles used under / within embankments for combined filtration and separation functions including drainage blankets.**Site subgrade conditions with CBR ≤ 3 must apply in the selection of geotextile strength class in accordance with Table 6.* | *Maximum nominal**Fill stone size (D85):. . . . . . . . . .mm**Site soil type: Granular / Cohesive**(delete whichever is not applicable)* |
| *G3* | *Geotextiles used in Subsoil Drains and Trench Drains* | *Maximum nominal**Fill stone size (D85):. . . . . . . . . .mm**Maximum Trench* *Depth (metres): . . . . . . . . . . . . . . . .**Site soil type: Granular / Cohesive**(delete whichever is not applicable)* |
| *G4* | *Geotextiles used for combination filtration and separation functions behind retaining structures including rock filled mattresses and over joints of pipes and arches.* | *Type of Structure: . . . . . . . . . . . . . .**Site soil type: Granular / Cohesive**(delete whichever is not applicable)* |
| *G5**Note* | *Geotextile used under rock armour revetment layer on embankments.**Site subgrade conditions with CBR ≤ 3 must apply in the selection of geotextile strength class in accordance with Table 6.* | *Maximum nominal* *Revetment stone size (D85): . . . .mm**Site soil type: Granular / Cohesive**(delete whichever is not applicable)* |

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**R86 FENCING**

***STOCK FENCE***

|  |  |
| --- | --- |
| *Mesh wire* | *6/70/30* |
| *Number of plain wires* | *1* |
| *Number of barbed wires* | *1* |
| *Spacing of posts* | *16 m* |
| *Number of star droppers between posts* | *3* |
| *Type of star droppers between posts* | *galvanised or black* |

***PEDESTRIAN SAFETY FENCE***

|  |  |
| --- | --- |
| *Colour* | *G61**Bronze Olive**Heritage Green* |

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