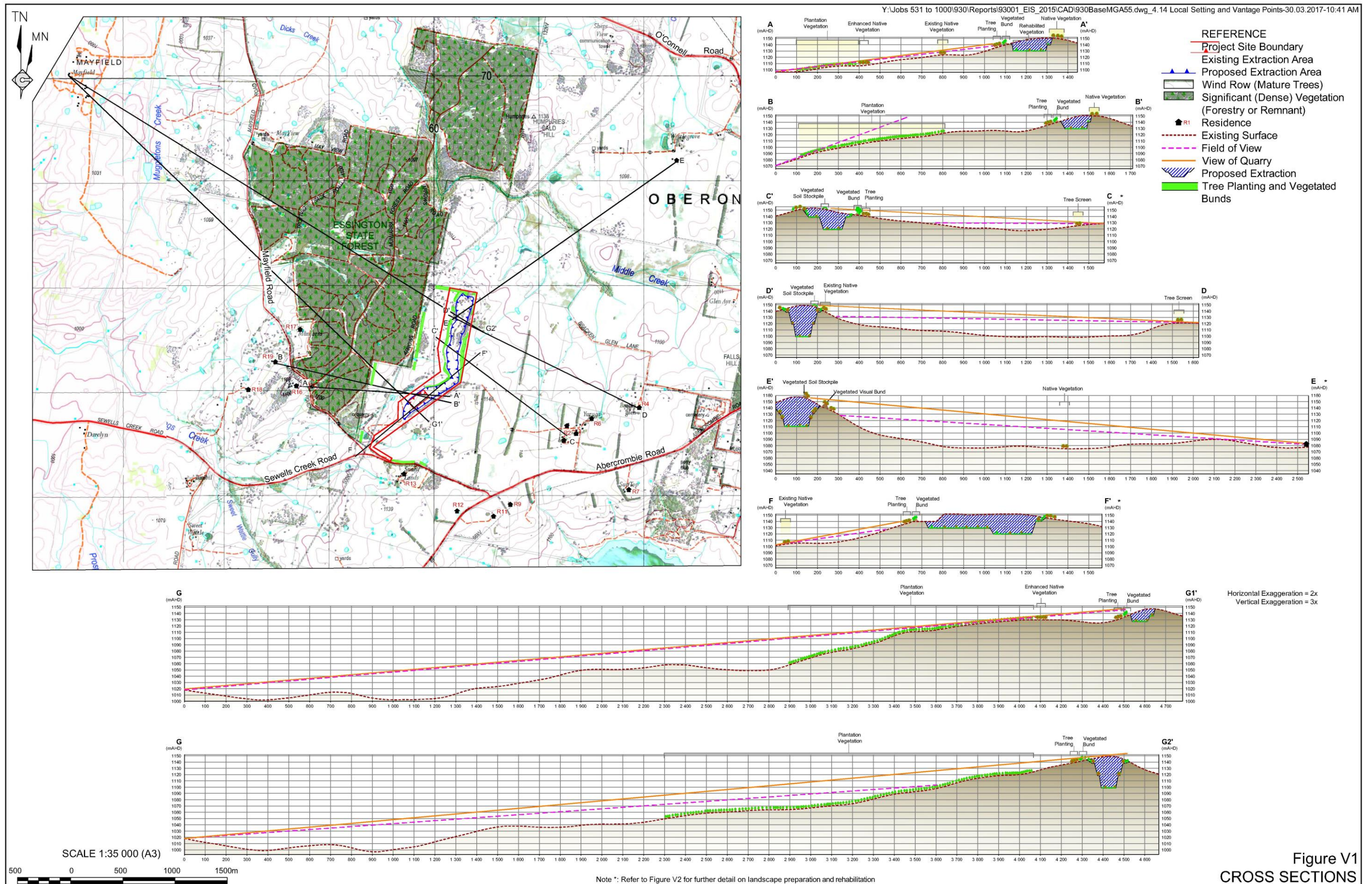


REHABILITATION AND LANDSCAPE MANAGEMENT PLAN

INTRODUCTION - This <i>Rehabilitation and Landscape Management Plan</i> (“the Plan”) has been prepared to support a development application (DA 10.2016.38.1) by Oberon Earthmoving Pty Ltd (“the Operator”) for an expansion of the Middle Creek Quarries on Lot 2 DP1112479 (“the Quarry”). - The Plan provides for: - management of potential intrusion on the visual amenity of surrounding landholdings, residential receivers and commercial ventures; - the integration of the constructed landform with surrounding landforms; and - the progressive implementation of landscape management and rehabilitation. - The Plan identifies landscape management domains (LMDs), describes the intended final landform and describes the objectives, completion criteria, methods and schedule for the rehabilitation and rehabilitation of the Quarry. - The Plan is to be reviewed annually and updated at least every 5 years for the life of the Quarry. - The Plan is valid for the period until satisfactory completion of rehabilitation (as confirmed by Oberon Council). <u>VISUAL AMENITY MANAGEMENT CONSIDERATIONS</u> - The Quarry will extract chert from a north-south aligned ridge. - The extraction area has been designed to maximise the natural screening provided by local topography, remnant native and plantation vegetation of these activities. - Extraction area development will, however, require some activities to commence at locations which without mitigation will be visible from surrounding landholdings, residences and publically accessible vantage points. Figure V1 (Sheet RP 02) provides visual cross-sections from vantage points between 45° and 330° which identify where views of surface extraction activities may be visible without mitigation. - The cross-sections include the landscape management and rehabilitation measures described in the Plan to prevent and mitigate visual impacts of the Quarry (see also Figure V2 – Sheet RP 03).	<u>LANDSCAPE MANAGEMENT DOMAINS</u> - Landscape Management Domains (LMDs) refer to areas of Quarry-related disturbance or surrounding land for which decommissioning, rehabilitation and/or landscaping activities will be similar. - Five LMDs have been identified (see inset on Figure R1 – Sheet RP 02) and a description of each is as follows. LMD1: Extraction Area Floor The final floor of the extraction area would be relatively flat and approximately 10m to 50m below surface. LMD2: Extraction Area Perimeter Immediately beyond the limit of extraction, landscape management works in the form of vegetation retention and enhancement, bund construction and vegetation establishment will be undertaken to provide for screening of extraction activities. LMD3: Extraction Area Batters and Benches Extraction is proposed to a depth of between 10m and 50m below final ground surface. This domain includes final batter slopes of 10° to 30°, in the more weathered zone (above ~1 150m AHD), and up to 75° in the more competent material below this elevation. LMD4: Quarry Roads This domain includes the access road from Sewells Creek Road to the extraction area as well as any internal haul roads external to other LMDs. LMD5: Property Perimeter Bordering Crown land, Sewells Creek Road and private property with vantage points of the Quarry, some landscaping of selected boundaries will be undertaken to improve local visual amenity. <u>FINAL LANDFORM (LMD1 – LMD3)</u> The final landform is illustrated in plan view on Figure R1 (Sheet RP 04) with a selection of sections provided on Figure R2 (Sheet RP 05). The final landform will transition from south to north roughly reflecting the identified extraction Cells 1, 2 and 3.	<u>FINAL LANDFORM (LMD1 – LMD3) (Cont’d)</u> <i>Southern Landform (Cell 1)</i> Refer also to Sections B-B` & F-F` of Figure R2. - The extraction area identified as Cell 1 would daylight to the west at between 1 135m and 1 140m AHD with a westerly oriented quarry face rising to between 1 155m and 1 160m AHD at an angle of 70°-75°. - A single bench of between 5m and 10m in diameter would be retained approximately 10m above the floor height and vegetated with native woodland shrub and tree species. - Views of the extraction area from the southwest, west and northwest are currently screened by a combination vegetation and topography (refer to Figure V1). To prevent any future exposure of the extraction area to vantage points in these directions, vegetation will be planted around the western perimeter of the extraction area. - The height of this vegetation screen will be enhanced in sections by the construction of a bund, rising to at least 3m above the extraction area floor, at selected points. - Should development of the extraction to a depth of 1 130m AHD follow (dependent on resource quality at depth), this Plan will be updated. <i>Northern Landform (Cell 2)</i> Refer also to Sections A-A`, D-D` & E-E` of Figure R2. - At the northern end of the Cell 2 extraction area, the landform is to be constructed as a stabilised void (to a depth of between 1 100m and 1 120m AHD) which drains internally to the north. - The landform will represent a ‘slot’ through the north-south oriented ridge line. This allows for views of the developing and final void to be restricted by the retained hill slopes from vantage points surrounding the Quarry. - The upper quarry face (above 1 140m AHD) will be of reduced slope (10° and 30°) to stabilise this more weathered section of the resource. - The 70° to 75° quarry faces along with 5m to 10m wide benches, vegetated with native woodland shrub and tree species, will be retained below an elevation of 1 140m AHD. - To further restrict views of the extraction area during development, vegetation will be planted beyond the immediate perimeter of the extraction area.	<u>FINAL LANDFORM (LMD1 – LMD3) (Cont’d)</u> <i>Northern Landform (Cell 2) (Cont’d)</i> - Where necessary based on available sight lines, an additional earth bund, rising to a height of 3m to 5m above ground level, will be constructed and immediately vegetated with grass, shrubs and tree species. - Extraction activities will only ‘daylight’ once these vegetation screens or vegetated bunds are established. <i>Transition Landform (Cell 3)</i> Refer also to Sections A-A` & C-C` of Figure R2. - At the southern end of Cell 3, the landform provides for a more gradual slope (10° to 30°) from the daylighting section of Cell1 (at approximately 1 140m AHD) to the void floor of Cell 2 at between 1 100m and 1 120m AHD. - To manage the exposure of the western quarry face from vantage points to the east, the intermediate bench at 1 140m will extend to 25m. - Elsewhere, the approach to the completed quarry faces will be the same as for Cell 2, i.e. profiled slope of 10° to 30° above an elevation of 1 140m AHD with 70° to 75° faces retained below this elevation. - The slot-style void will drain internally to the north. <u>FINAL LANDFORM (LMD4 & LMD5)</u> - The landscaped Quarry Entrance and Access Road will be retained for ongoing property access at the cessation of Quarry operations. - The majority of sediment basins established to prevent the discharge of dirty water from the Quarry will be retained for water storage on the property. - Vegetation established around the perimeter of Lot 2 DP2112479 will be retained. <u>FINAL LAND USES</u> - Integration with grazing and other agricultural activities on the “Middle Creek” property. - Enhancement and maintenance of woodland vegetation within and surrounding the final Quarry landform.
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REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS			CLIENT	 R.W. CORKERY & CO. PTY. LIMITED	PROJECT TITLE MIDDLE CREEK QUARRIES	REHABILITATION AND LANDSCAPE MANAGEMENT PLAN – GENERAL NOTES 1			
0	30/03/17	AI		Original for JRPP Determination	DESIGN BY:		N/A	 R.W. CORKERY & CO. PTY. LIMITED			PROJECT TITLE MIDDLE CREEK QUARRIES	REHABILITATION AND LANDSCAPE MANAGEMENT PLAN – GENERAL NOTES 1		
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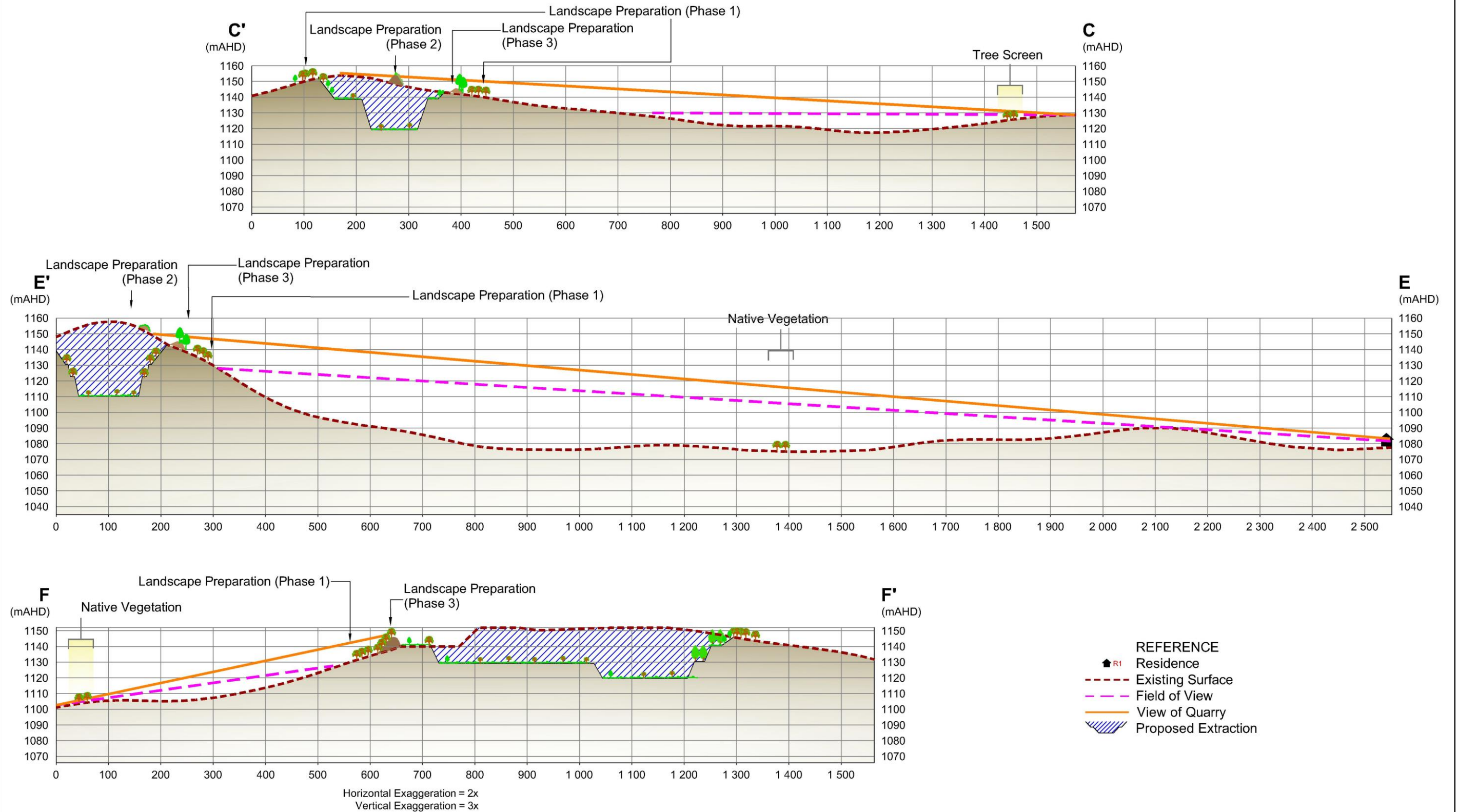
REHABILITATION AND LANDSCAPE MANAGEMENT PLAN



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2					APPROVAL		N/A							

REHABILITATION AND LANDSCAPE MANAGEMENT PLAN

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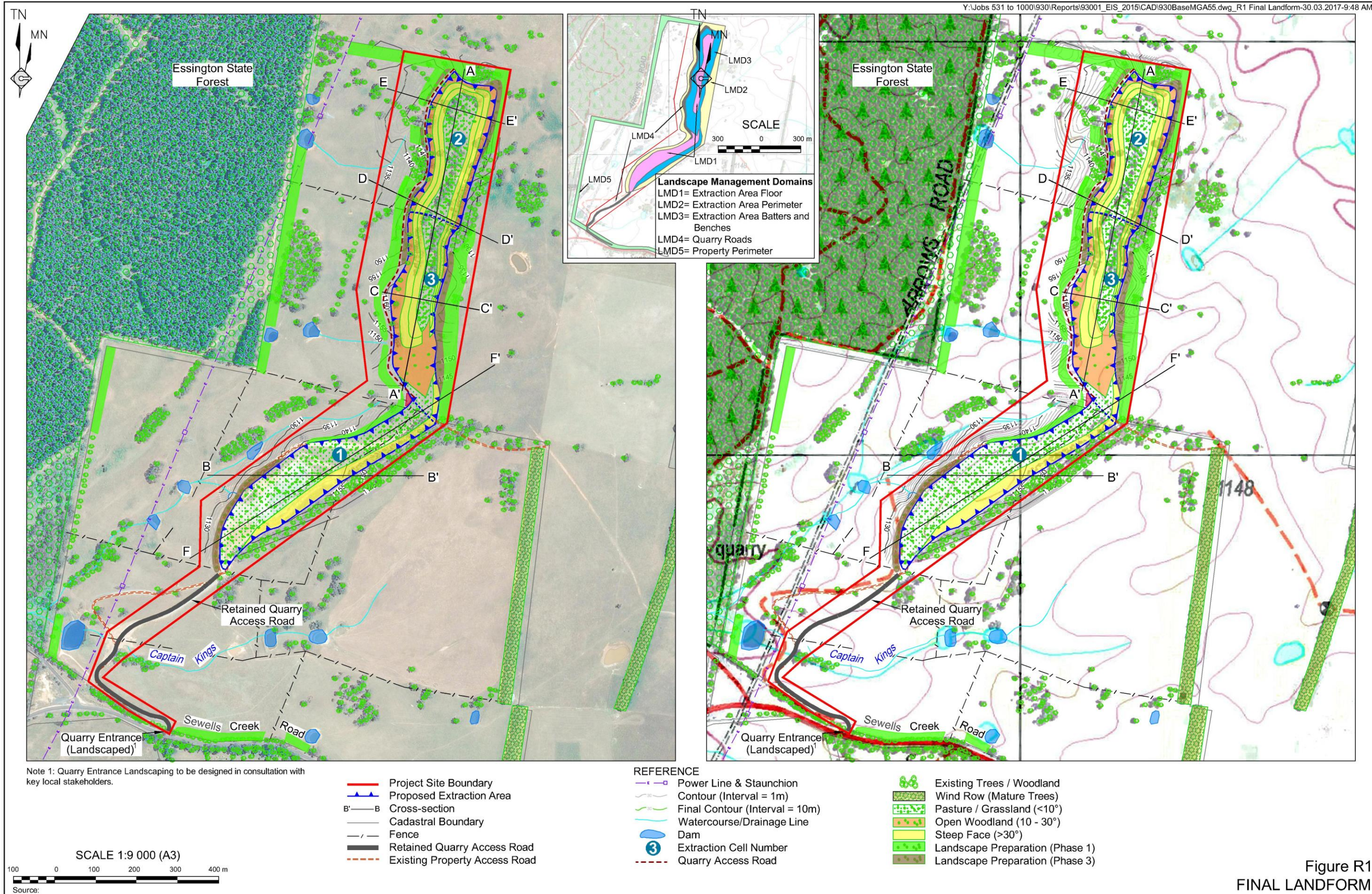


Note 1: Establishment and management of temporary stockpiles and long-term visual bunds illustrated on Figure C

Figure V2
LANDSCAPE PREPARATION AND
REHABILITATION

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REHABILITATION AND LANDSCAPE MANAGEMENT PLAN



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2					APPROVAL		N/A							

REHABILITATION AND LANDSCAPE MANAGEMENT PLAN

GENERAL NOTES

OBJECTIVES AND COMPLETION CRITERIA

Objective 1: Non-essential equipment and infrastructure is decommissioned and/or removed

Completion Criteria

- (a) All fixed and mobile plant is removed from the Quarry.
- (b) All roads not required for future property access and agricultural land use are decommissioned, ripped and allowed to revegetate.

Objective 2: No land contamination

Completion Criteria

- (a) All accepted waste materials are applied to land in accordance with the appropriate Resource Recovery Exemption or removed from the Quarry.
- (b) Material within the Containment Sump (for collection of runoff from composting activities) is removed along with the sump liner.
- (c) Soil testing confirms no contamination of land surrounding the Containment Sump.
- (d) No fuel spills or leaks during rehabilitation.

Objective 3: The landform is stable, non-eroding with controlled drainage

Completion Criteria

- (a) Terminal faces and benches (LMD3) are geotechnically stable.
- (b) Slopes of the upper bench (within more weathered zone above 1 140m AHD) do not exceed 30° (see **Figures R1 and R2**).
- (c) Upslope drainage of LMD2 is stabilized and does not require ongoing maintenance, i.e. no uncontrolled discharges into the final void.
- (d) No visible erosion from retained bunds of LMD2.
- (e) Internal drainage of LMD1 is to defined dams, not multiple pools across the final void floor.
- (f) Drainage downslope of the rehabilitated landform is non-eroding.

OBJECTIVES AND COMPLETION CRITERIA (Cont'd)

Objective 4: A sustainable growth medium is established

Completion Criteria

- (a) A layer of soil, or equivalent growth medium, is present over the extraction area floor (LMD1), benches (of LMD3) and bunds (of LMD2). Soil thickness to achieve:
 - 150mm to 200mm on slopes of <10°; or
 - 50mm to 150mm on slopes of between 10° and 30°.
- (b) No visible erosion of respread soil.

Objective 5: Vegetation with maintenance requirements no greater than the surrounding landform

Completion Criteria

- (a) Groundcover coverage of at least 70% maintained within LMD1, LMD2 and slopes <30° of LMD3.
- (b) Native tree and shrub species established within LMD2, LMD3 and LMD5 as identified on **Figure R1**.
- (c) No declared noxious weeds present.

Objective 6: No discharge of polluting runoff

Completion Criteria

- (a) Containment Sump appropriately decommissioned and rehabilitated.
- (b) Implementation of erosion and sediment control structures and management practices in accordance with an *Erosion and Sediment Control Plan*.

Objective 7: The landform is not visually intrusive to surrounding vantage points

Completion Criteria

- (a) A corridor of contiguous native woodland vegetation is established and maintained within LMD2.
- (b) Visual bunds constructed within LMD2 are vegetate and sympathetic to surrounding landforms.
- (c) The retained 70° to 75° faces are either not visible from residential or publically accessible vantage points, or effectively screened by established vegetation on final benches.

OBJECTIVES AND COMPLETION CRITERIA (Cont'd)

Objective 8: Rehabilitation is completed within reasonable timeframe

Completion Criteria

- (a) Demonstrated progress towards achievement of Objectives 1 to 7 (as relevant) within 6 months of completion of designated activity, e.g. bund construction, drainage installation, extraction to maximum depth.

PLAN SEQUENCE

Landscape preparation, quarry development and rehabilitation works will be undertaken generally in accordance with the following.

- As far as practicable, surface disturbance will only occur after landscape preparation works have been completed to remove or reduce exposure to off-site vantage points.
- This sequence, whereby daylighting of the extraction area only occurs after landscape preparation works are completed, is illustrated conceptually by **Figure R3 (Sheet RP 09)**.
- Rehabilitation works will be undertaken as soon as possible within Cell 1 and on the upper benches of Cells 2 and 3.

Works are to proceed in the following order.

Landscape Preparation (Phase 1)

1. Prepare landscaped design for the revised Quarry Entrance (refer to Notes on Quarry Entrance Landscaping).
2. Survey the revised alignment of the Quarry Entrance and Sewells Creek Road.
3. Construct the Quarry Entrance, including realignment of Sewells Creek Road, in accordance with approved landscape design (refer to Notes on Quarry Entrance Landscaping).
4. Survey the limit of the extraction area and alignment of the Quarry Access Road surveyed and install markers at roughly 100m intervals.
5. Establish the Quarry Access Road on the western side of ridge line (refer to **Figure R1**) (refer to Notes on Quarry Access Establishment).
6. Plant / sow native vegetation screens within LMD2 and LMD5 and restrict access as identified on **Figure R1** (refer to Notes on Native Vegetation Screen Establishment).

PLAN SEQUENCE (Cont'd)

Landscape Preparation (Phase 1) (Cont'd)

7. Plant native tree and shrub species within the replanting zones of LMD2 and LMD5 (refer to Notes on Native Vegetation Screen Establishment).

Landscape Preparation (Phase 2)

8. Clear trees and shrubs and push into stockpiles ahead of soil stripping and extraction of gravel (refer to Implementation Notes on Vegetation Clearing and Management). Retain this material in stockpiles for placement on the final landform (refer to Notes on Cleared Vegetation Reuse).
9. Strip soil, including any groundcover, and push into a windrow on the northern and eastern slopes of the ridgeline to be extracted (refer to Implementation Notes on Soil Stripping and Soil Stockpiling and **Figure R3 – Sheet RP 09**).
This material is to be used to provide a temporary visual screen of quarry development and extraction activities (Landscape Preparation Phase 3) (refer also to Notes on Landscape Preparation, Extraction and Rehabilitation Sequence).

Quarry Development

10. Commence gravel extraction from the western perimeter of the extraction area and progress to the east (refer to Notes on Landscape Preparation, Extraction and Rehabilitation Sequence).

Landscape Preparation (Phase 3)

11. On establishment of vegetation within the replanting zones of LMD2, construct additional bunds in the locations around the extraction area identified on **Figure R1** (and other locations as required to reduce visual intrusion) (refer to Notes on Landform Establishment – LMD2 Extraction Area Perimeter).
12. Spread previously stockpiled soil over these bunds (refer to Notes on Growth Medium Development).
13. Plant native tree and shrub species over the bunds (refer to Notes on Native Vegetation Screen Establishment).
14. On completion of Landscape Preparation (Phase 3), reuse the stockpiled soil within the extraction area to be developed in rehabilitation of completed areas of the Quarry (where available) or relocate to locations adjoining future rehabilitation works.

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REHABILITATION AND LANDSCAPE MANAGEMENT PLAN																																																													
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PLAN SEQUENCE (Cont'd) Quarry Extraction 15. Continue gravel extraction in an easterly direction, maintaining the existing eastern slope of the ridge line between extraction activities and vantage points to the east (refer to Notes on <u>Extraction, Landscape Management and Rehabilitation Sequence</u>). 16. Continue extraction progressively deeper in a west to east progression through each cell. Special Sequence (Cell 3) Noting Cell 3 is more exposed visually to the east, the following modified and restricted sequence of landscape preparation and quarry development is to be followed. - The activities of Landscape Preparation (Phase 1) will be undertaken concurrently with activities elsewhere on the Quarry Site. - The activities of Landscape Preparation (Phase 2) will not be undertaken for at least two years and only when the vegetation of the replanting zone to the east of Cell 2 is established. - Quarry development activities will not be undertaken for at least five years and only when the vegetation of the bund wall (Landscape Preparation – Phase 3) is established.					PLAN SEQUENCE (Cont'd) Rehabilitation (Cont'd) 21. Complete any stabilizing remedial works within the LMD1 to LMD3 (as extraction completed). 22. Spread soil over the constructed landform (refer to Notes on <u>Growth Medium Development</u>). 23. Place previously cleared and stockpiled vegetation over the constructed landform of LMD1 and LMD2 (upper batter of <30°) (refer to Notes on <u>Cleared Vegetation Reuse</u>). 24. Establish sediment fencing down-slope of non-essential roads (LMD4) (refer to Notes on <u>Sediment Fencing</u>). 25. Rip any non-essential roads and allow to naturally revegetate (refer to Notes on <u>Landform Establishment: LMD4</u>). 26. Ensure all monitoring and maintenance procedures are implemented and adhered to (refer to Notes on <u>Performance Monitoring and Measurement</u>). SPECIAL COMMITMENT – MAYFIELD GARDENS Figure V1 illustrates that the extraction area could, without mitigation, be visible from elevated vantage points within the Mayfield Garden Estate (elevations of 1 020m AHD). In the event activities, other than landscape preparation works, become visible from Mayfield Garden, the Operator will undertake the following. - Cease those activities visible from Mayfield Garden. - Review the extent of visibility and propose measures to screen these activities. Any additional reasonable and feasible mitigation measures proposed by Mayfield Garden will be incorporated. - On agreement as to mitigation measures (by Mayfield Garden and the Operator), these measures will be implemented. - Where there is disagreement over reasonable and feasible mitigation measures, Oberon Council will review and adjudicate. - On completion of physical works associated with the agreed or enforced mitigation measures, extraction activities may recommence in the relevant area.					QUARRY ENTRANCE LANDSCAPING - Commission the preparation of a conceptual landscape design for the Quarry Entrance (accommodating key intersection design features and safe intersection sight distances). - Distribute the concept design to key local stakeholders including Oberon Council, operator of Mayfield Garden and land owners on Sewells Creek Road and Mayfield Road (south of Mayfield Garden Estate). - Complete any reasonable and feasible modifications to design. - Obtain approval for final design from Oberon Council. - Complete Quarry Entrance landscaping in accordance with the approved final landscape design. QUARRY ACCESS ESTABLISHMENT - Survey and mark the alignment of the Quarry Access Road using survey pegs or equivalent markers. - Establish sediment fencing downslope of the road alignment (or follow measures nominated in the Quarry <i>Erosion and Sediment Control Plan</i>) (see also SD 6-8 – Sheet RP 11). - Mark, using survey pegs or equivalent, the landscape preapration zones (as identified on Figure R1) and identify the designated entry point for vehicles and mobile equipment. - Soil erosion hazard to be kept as low as practicable by minimizing land disturbance in accordance with Table R1.					NATIVE VEGETATION SCREEN ESTABLISHMENT - Mark the extent of vegetation screens using survey pegs or equivalent markers. - Lightly rip the existing soil within the nominated areas. - Plant or sow native tree and shrub species to achieve density of 1 tree per 3m² and mid-storey (shrub) layer to achieve foliage cover >70%. Table R2 provides a list of indicative species for replanting (with exact species mix dependent on seasonal availability). - Review germination and/or planting success after 4 to 6 weeks and repeat above steps if success below objectives. <table><tr><th colspan="2">TABLE R2 INDICATIVE SPECIES FOR REHABILITATION</th></tr><tr><th colspan="2">Trees</th></tr><tr><td>Narrow-leaved Peppermint</td><td><i>Eucalyptus radiata</i></td></tr><tr><td>Broad-leaved Peppermint</td><td><i>E. dives</i></td></tr><tr><td>Mountain Gum</td><td><i>E. dalrympleana</i></td></tr><tr><td>Red Stringybark</td><td><i>E. macrorhyncha</i></td></tr><tr><th colspan="2">Shrubs</th></tr><tr><td>She-oak</td><td><i>Allocasuarina diminuta</i></td></tr><tr><td>Green Wattle</td><td><i>Acacia irrorata</i></td></tr><tr><td>Black Wattle</td><td><i>A. melanoxlon</i></td></tr><tr><td>Silver Wattle</td><td><i>A. dealbata</i></td></tr><tr><td>Coast Myall</td><td><i>A. binervia</i></td></tr><tr><th colspan="2">Understorey / Groundcover</th></tr><tr><td>Poa</td><td><i>Poa sieberiana</i></td></tr><tr><td>Bracken Fern</td><td><i>Pteridium esculentum</i></td></tr><tr><td>Wallaby Grass</td><td><i>Rytosperma</i></td></tr><tr><td>Redanther Wallaby Grass</td><td><i>Joycea pallida</i></td></tr><tr><td>Rough Spear Grass</td><td><i>Austrostipa</i></td></tr><tr><td>Clematis</td><td><i>Clematis aristida</i></td></tr><tr><td>Hedgehog Grass</td><td><i>Echinopogon ovatus</i></td></tr></table>							TABLE R2 INDICATIVE SPECIES FOR REHABILITATION		Trees		Narrow-leaved Peppermint	<i>Eucalyptus radiata</i>	Broad-leaved Peppermint	<i>E. dives</i>	Mountain Gum	<i>E. dalrympleana</i>	Red Stringybark	<i>E. macrorhyncha</i>	Shrubs		She-oak	<i>Allocasuarina diminuta</i>	Green Wattle	<i>Acacia irrorata</i>	Black Wattle	<i>A. melanoxlon</i>	Silver Wattle	<i>A. dealbata</i>	Coast Myall	<i>A. binervia</i>	Understorey / Groundcover		Poa	<i>Poa sieberiana</i>	Bracken Fern	<i>Pteridium esculentum</i>	Wallaby Grass	<i>Rytosperma</i>	Redanther Wallaby Grass	<i>Joycea pallida</i>	Rough Spear Grass	<i>Austrostipa</i>	Clematis	<i>Clematis aristida</i>	Hedgehog Grass	<i>Echinopogon ovatus</i>
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Construction Areas	Limited to 5m from the edge of any essential construction activity as shown on the engineering plans	All site workers should clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment feincing (downslope) or similar materials.																																																											
Access Areas	Limited to a maximum width of 5m	The site manager will determine and mark the location of these zones on the site. They can vary in position so as to best conserve exsiting vegetation and protect downstream areas while being considerate of the needs of effecient works activities. All site workers will clearly recognise these boundaries.																																																											
Remaining lands including revegetation areas	Entry prohibited except for essential management works.	Thinning of growth might be necessary as part of bush fire management plans or weed reduction strategies.																																																											
<table><tr><th>REV</th><th>DATE</th><th>BY</th><th>APP.</th><th>REVISION DETAILS</th></tr><tr><td>0</td><td>30/03/17</td><td>AI</td><td></td><td>Original for JRPP Determination</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td></tr></table>					REV	DATE	BY	APP.	REVISION DETAILS	0	30/03/17	AI		Original for JRPP Determination	1					2					<table><tr><th colspan="3">DRAWING STATUS</th></tr><tr><td>DESIGN BY:</td><td></td><td>N/A</td></tr><tr><td>DRAWN BY:</td><td></td><td>N/A</td></tr><tr><td>APPROVAL</td><td></td><td>N/A</td></tr></table>			DRAWING STATUS			DESIGN BY:		N/A	DRAWN BY:		N/A	APPROVAL		N/A			 R.W. CORKERY & CO. PTY. LIMITED		PROJECT TITLE MIDDLE CREEK QUARRIES		REHABILITATION AND LANDSCAPE MANAGEMENT PLAN – GENERAL NOTES 7 / IMPLEMENTATION NOTES 1															
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REHABILITATION AND LANDSCAPE MANAGEMENT PLAN

IMPLEMENTATION NOTES

VEGETATION CLEARING AND MANAGEMENT

- Vegetation clearing only undertaken for upcoming 12 months development.
- Ensure areas to be cleared are clearly marked on the ground to avoid over clearing.
- Avoid clearing of mature trees between September and November (to limit adverse impacts on tree dependent avifauna and microchiropteran bats).
- Prior to any tree clearing.
 - A Pre-clearing check of hollow bearing trees will be completed (for signs of use or habitation).
 - The inspection will be undertaken immediately before tree felling.
 - If a bird is in the nest, clear the trees around it first to see if the animal will disperse.
 - If the bird is a nestling, seek professional advice prior to removal.
- Salvage tree trunks, major limbs and, if practicable, minor branches for use in rehabilitation.
- Inform site personnel of the significance and importance of this material for rehabilitation.
- Complete regular inspections of stockpiled vegetation for vermin and complete pest reduction as necessary.
- Replace vegetation over earth bunds, profiled slopes of <30° and the completed and profiled floor of the extraction area to provide organic material and microhabitat features (refer to Notes on Cleared Vegetation Reuse).

SOIL STRIPPING

- Where a layer of soil is identified, this will be stripped to a depth of at least 200mm ahead of excavation.
- Soil stripping will not be undertaken during or following rainfall when soil likely to be damp.
- Soil stripping will not be undertaken during hot, windy conditions.
- Stripped soil will, where practicable, be immediately transferred to either the earth bunds of LMD3 or completed landforms of LMD1 or LMD2 (refer to Notes on Growth Medium Development).
- If immediate transfer of soil is not possible due to a lack of available landform for respreading, it will be temporarily stockpiled for future use (refer to Notes on Soil Stockpiling).

SOIL STOCKPILING

- All stockpiles will be constructed in accordance with SD 4-1 (**Sheet RP 11**).
- Soil stockpiles will not exceed 2m in height.
- Slopes of the stockpiles will be battered to provide a 2:1 (H:V) slope.
- Stockpiles will be at least 40m from a watercourse.
- Stockpiles will be stabilized to achieve a Cover (C-) Factor of 0.1 within 10 working days of formation (equivalent to 60% groundcover).
- Stockpiles retained in excess of 10 days, which are not stabilized as noted above, will be protected through installation of silt fencing (refer to Notes on Sediment Fencing).

LANDFORM ESTABLISHMENT

LMD1: Extraction Area Floor

- Following any remedial works on the extraction area batters and benches, e.g. rock scaling, slope reduction, remove any large rocky material.
- Final ripping and profiling of the floor to be completed to provide for internal slope of between 1° and 3° to the north.
- Define flow path and construct local depressions (1m to 2m below main floor level) for collection of any surface runoff.
- Survey to confirm 1° to 3° slope profile and undertaken any remedial profiling works as required.

LMD2: Extraction Area Perimeter

- Following soil stripping, a layer of gravel is to be excavated and placed in windrows as part of Landscape Preparation (Phase 3) and identified on **Figure R1**.
 - These bunds will be constructed with slopes of 2H:1V (30°) and rise to between 3m and 5m above the upslope toe (refer to **Figure R3** and Sections B-B`, C-C` and E-E` on **Figure R2**).
 - The surface of the bund will be smoothed to remove any loose rocks.
- Retain remaining areas of LMD2 unmodified subject to establishment of vegetation.
- Apply a stabilizing agent as required to prevent erosion and assist in keying soil to be applied.

LANDFORM ESTABLISHMENT (Cont'd)

LMD3: Extraction Area Batters and Benches

- Reduce the slope of batters in the more weathered chert material (above 1 150m AHD) to 30° or less either by:
 - excavating material from the upper section and dragging to the toe of the batter; or
 - Ripping and pushing material from the top of the slope using a bulldozer (see **Figure R4 – Sheet RP 09**).
- Retain the remaining terminal faces with final angle of 75° or less (subject to geotechnical stability assessment).
- Retain benches of at least 5m in diameter.
- Following inspection to assess stability, complete remedial works as required, e.g. rock scaling or minor slope reduction.
- If blasting is required, complete in accordance with established Quarry blast protocols.
- On confirmation of geotechnical stability, no further works required.

LMD4: Roads

- Install silt fencing downslope of non-essential road.
- Rip (parallel to contour) to a depth of up to 0.5m.
- Place selected larger vegetation (previously cleared) along the ripped landform (to prevent access and promote natural regeneration).
- Remove silt fencing once vegetation established.

GROWTH MEDIUM DEVELOPMENT

- Spread soil over the created landforms, including the earth bunds of LMD2, as follows.
 - For the earth bunds, an excavator or backhoe will place the soil at the top of slope and allow to fall from top of slope to bottom. As a result, the soil layer is likely to be thicker at bottom of slope (~200mm).
 - For the <30° profiled slopes of LMD1 and LMD3, soil will be paddock dumped and pushed by bulldozer from the top of slope to bottom to provide a soil depth of between 150mm and 200mm.
 - Soil will be placed at the toe of each terminal face of LMD3 such that as the quarry is developed deeper, growth medium is left on the retained bench.

GROWTH MEDIUM DEVELOPMENT (Cont'd)

- Where practical to do so, e.g. low slope surfaces of LMD1 and LMD3, lightly rip the soil layer to assist with water infiltration and vegetation growth.
- Inspect the landform within 2 to 3 weeks and reapply soil as required, i.e. where erosion has removed this.
- Apply a stabilizing agent as necessary.

REVEGETATION

- Sow mix of native grass, shrub and tree species, common or complementary to that present prior to development (refer to **Table R2**).
- Water on initial application.
- Install a temporary fence line or other form of identification will be installed to ensure that future extraction does not disturb this vegetation once established.
- Inspect after 4 to 6 weeks and reapply seed as required.

CLEARED VEGETATION REUSE

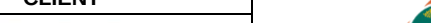
- Select larger trunks and branches and placed over closed and ripped roads.
- Place remaining trunks and larger branches against terminal face of LMD1 and LMD3 where greatest value as microhabitat will be provided.
- Track roll or mulch remaining vegetation and spread over the soil to assist in returning organic material and base nutrients to the soil.

SEDIMENT FENCING

- Silt fencing protection is to be established down-slope of any new disturbance where earth bank diversion drains are not established.
- Silt fencing will be installed and maintained as described by SD 6-8 (**Sheet RP 11**).

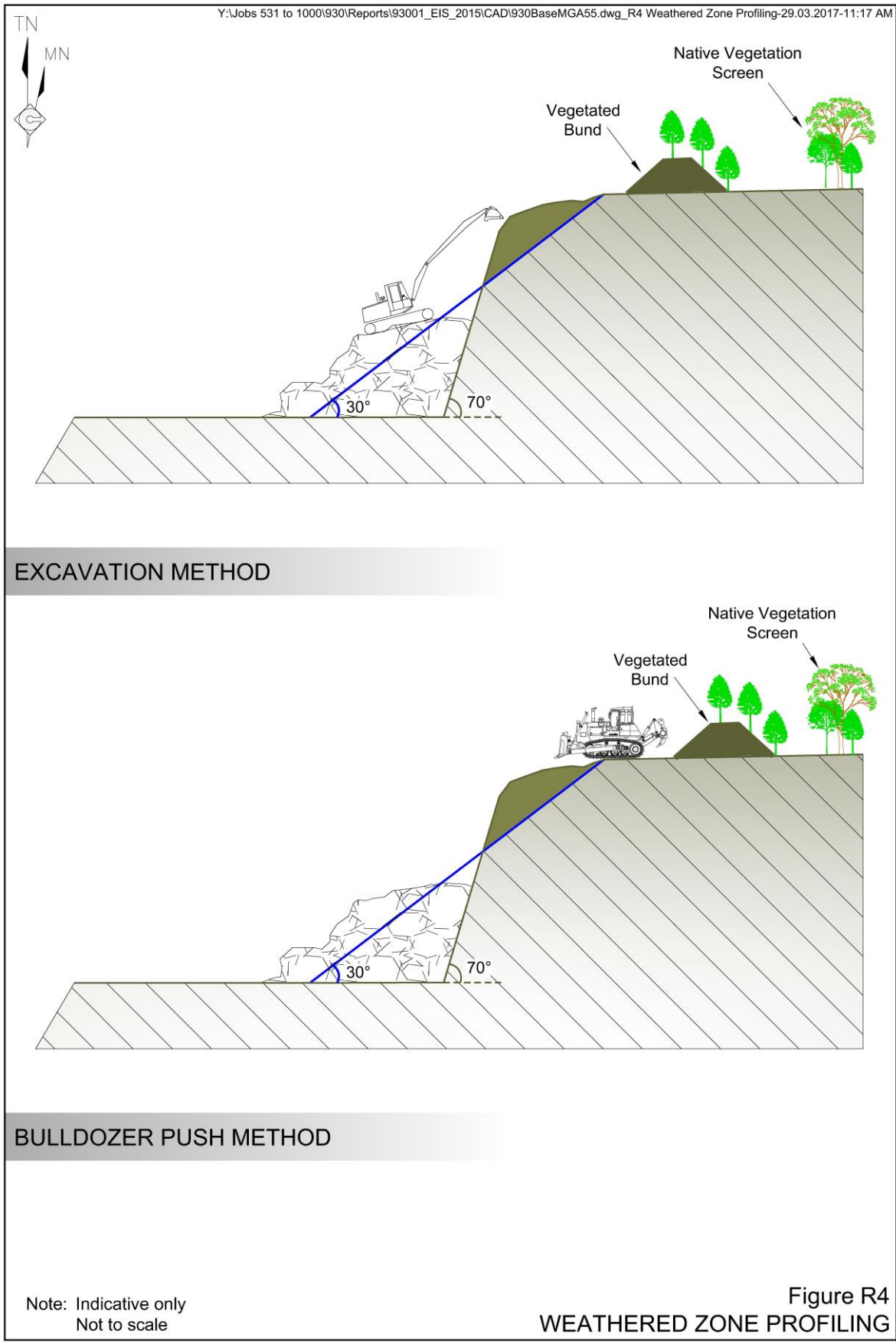
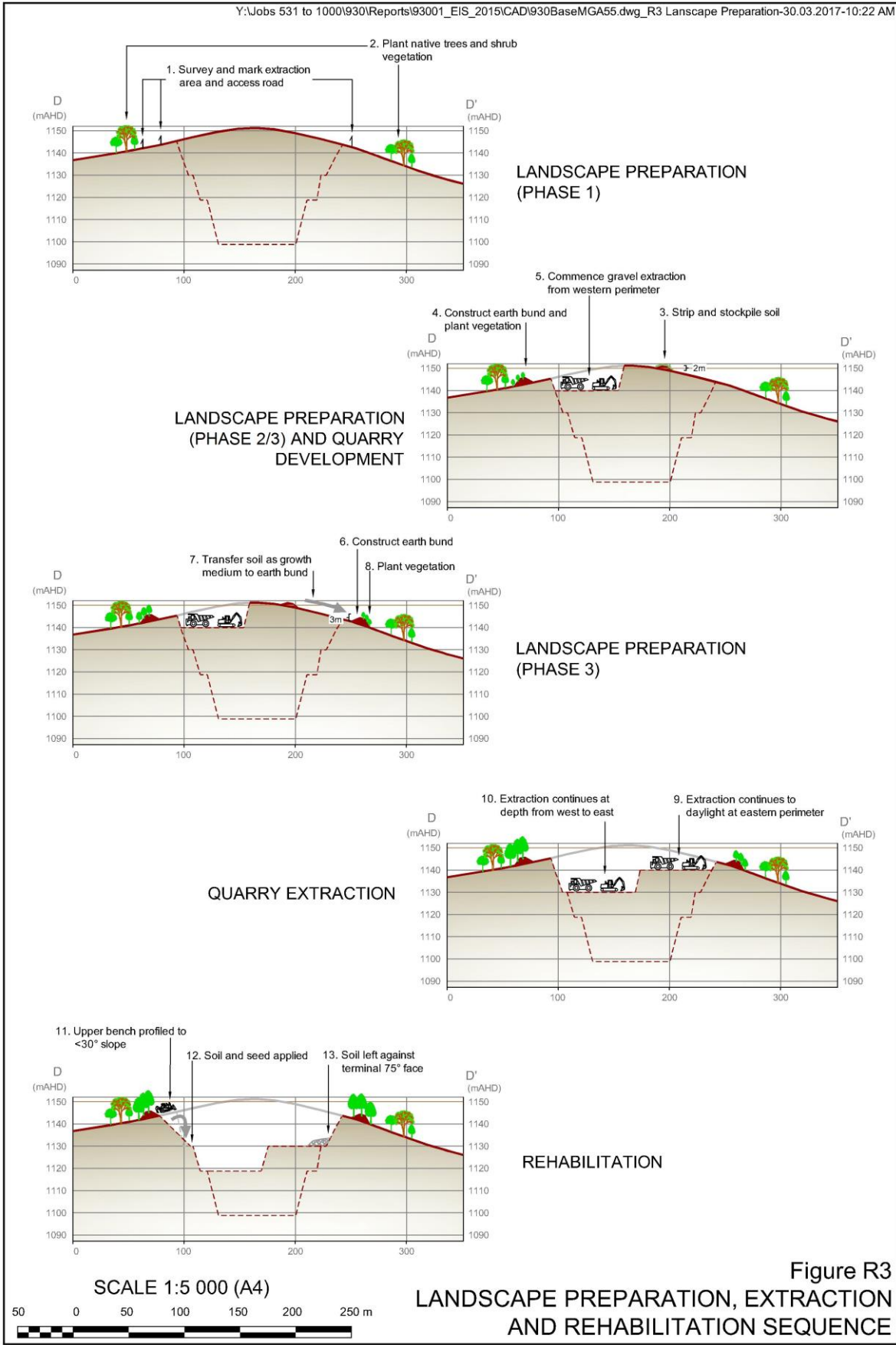
PERFORMANCE MONITORING AND MEASUREMENT

- **Table R3** provides the planned monitoring and maintenance regime to demonstrate the completion criteria for the Rehabilitation Objectives noted on **Sheet RP 10**.

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0	30/0317	AI		Original for JRPP Determination	DESIGN BY:		N/A						
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REHABILITATION AND LANDSCAPE MANAGEMENT PLAN

IMPLEMENTATION NOTES



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					PROJECT TITLE			MIDDLE CREEK QUARRIES
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					PROJECT NO. 930/05			SHEET NO. RP 09
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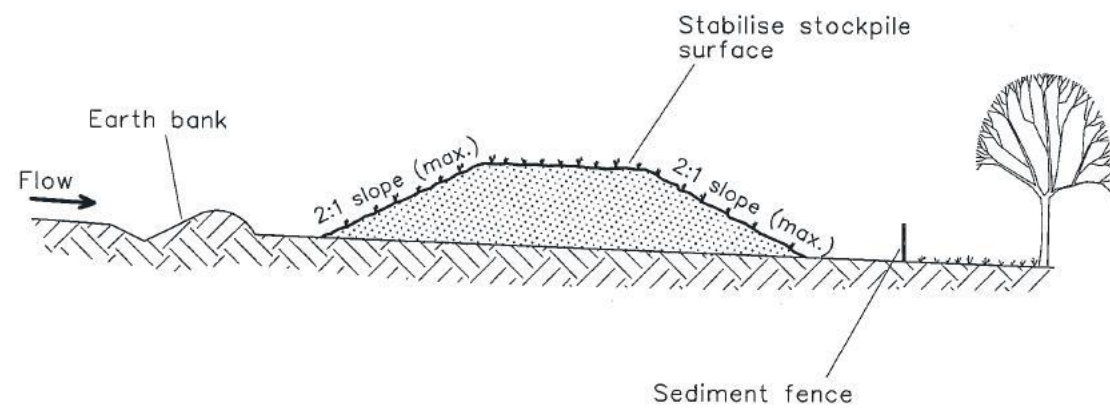
REHABILITATION AND LANDSCAPE MANAGEMENT PLAN

TABLE R3 REHABILITATION MONITORING AND MAINTENANCE

Objective	Completion Criteria	Monitoring	Frequency	Maintenance
All non-essential infrastructure is decommissioned and/or removed from the Quarry	(a) All fixed and mobile equipment is removed from the Quarry.	Final Inspection.	On completion of extraction and processing.	Proponent to commission removal of any remaining plant. Non-essential roads to be identified and rehabilitation in accordance with Notes on <i>Landform Establishment: LMD4</i> .
	(b) All roads not required for future property access and agricultural land use are decommissioned, ripped and allowed to revegetate.			
No land contamination	(a) All accepted waste materials are either incorporated into the final landform in accordance with the appropriate Resource Recovery Exemption or removed from the Quarry Site.	Final Inspection.	On completion of extraction and processing.	Material applied to landform in accordance with relevant Resource Recovery Exemption. Where any doubt over the material remains, consult with the EPA and follow instruction.
	(b) Material within the Containment Sump is removed along with the sump liner.	Final Inspection.	On completion of extraction and processing.	Excavate and dispose of material and liner to a facility licensed to accept this class of waste.
	(c) Soil testing confirms no contamination of land surrounding the Containment Sump.	Pre-closure soil testing.	Prior to landform establishment.	Excavate any contaminated material and dispose of to a facility licensed to accept this class of waste.
	(d) No fuel spills or leaks during rehabilitation.	Daily inspection by rehabilitation supervisor.	At least daily.	Source of leak / spill identified and repaired / prevented. Area of spill isolated, excavated, placed within final extraction area, covered with straw and allowed to bioremediate. Any discharge is reported and remediation undertaken in consultation with the EPA.
The landform is stable, non-eroding with controlled drainage	(a) Terminal faces and benches (Domain LMD3) are geotechnically stable.	Geotechnical Inspection / Assessment.	On completion of final landform.	To follow instruction of assessor. Should earthworks beyond disturbance footprint be recommended, Oberon Council is to be consulted.
	(b) Slopes of the upper bench (within more weathered zone) do not exceed 30°.	Survey	Prior to application of growth medium.	Remedial earthworks.
	(c) Upslope drainage of Domain LMD2 is stabilized and does not require ongoing maintenance.	Visual inspection (with photo record).	Annual (to coincide with Annual Report).	As required to ensure performance is to Blue Book standard.
	(d) No visible erosion from retained bunds of LMD2.			
	(e) Internal drainage of LMD1 is to defined dams, not multiple pools across the final void floor.	Inspection and recording of any pooling.	Following rainfall exceeding 25mm/24hr.	Earthworks will be undertaken to re-profile the slope to remove any depressions.
	(f) No visible erosion of respread soil.	Inspection	Following rainfall exceeding 25mm/24hr.	Earthworks will be undertaken to remove any rilling or gullyng.
A sustainable growth medium is established	(a) A layer of soil or equivalent growth medium is present.	Inspection	Following application.	Respreading of soil (if safe to do so).
	(b) No visible erosion of respread soil.	Inspection	Following rainfall exceeding 25mm/24hr.	Earthworks will be undertaken to remove any rilling or gullyng.
Vegetation with maintenance requirements no greater than the surrounding landform	(a) Groundcover coverage of at least 70% maintained within LMD1, LMD2 and slopes <30° of LMD3.	% cover of grass achieved assessed using a 1m ² quadrat method.	Approximately fortnightly until 70% cover achieved.	If 70% cover not achieved within 6 weeks of sowing, the area will be re-sown.
	(b) Native tree and shrub species established within LMD2, LMD3 and LMD5 as identified on Figure R1 .	Inspection and recording of species diversity.	September following commencement of the Plan.	Additional tube-stock to be planted, representative of species which have poor survival rate.
	(c) No declared noxious weeds present.	General inspection.	Ad hoc / as part of general quarry / property management.	Weed control measures to be implemented in consultation with relevant weeds officer.
No discharge of polluting runoff	(a) Containment Sump appropriately decommissioned and rehabilitated.	Regular inspection.	Following runoff generating rainfall.	Regrade or repair the contour bank where breached.
	(b) Implementation of erosion and sediment control structures and management practices in accordance with an <i>Erosion and Sediment Control Plan</i> .	Refer to <i>Erosion and Sediment Control Plan</i> .		
The landform is not visually intrusive to surrounding vantage points	(c) A corridor of contiguous native woodland vegetation is established and maintained within LMD2.	Field inspection and photos from external vantage points.	Annual (to coincide with Annual Report).	Supplementary tree planting or seed sowing.
	(d) Visual bunds constructed within LMD2 are vegetate and sympathetic to surrounding landforms.			Remedial earthworks to modify bund slopes followed by remedial tree planting or seed sowing to replace any lost vegetation.
	(e) The retained 70° to 75° faces are either not visible or effectively screened.	Field inspection and photos from external vantage points.	Annual (to coincide with Annual Report).	Supplementary tree planting or seed sowing.

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REHABILITATION AND LANDSCAPE MANAGEMENT PLAN

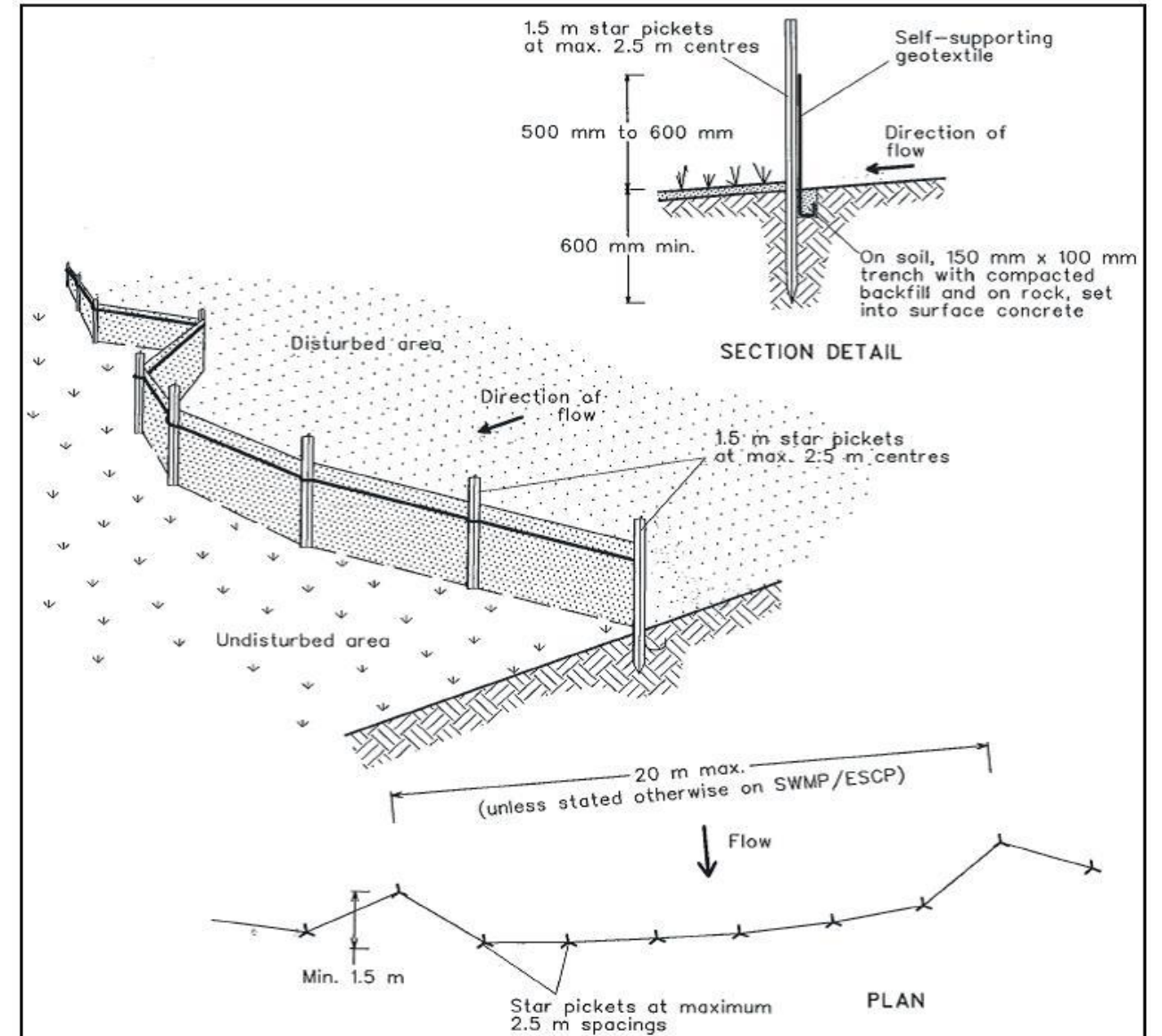


Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES

SD 4-1



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE

SD 6-8

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		PROJECT NO. 930/05	SHEET NO. RP 11	REV 0