



DENMAN ROAD SOLAR PARK

LANDSCAPE MAINTENANCE PLAN

FOR ASLAT CONSULTING

22nd April 2021 Rev B

Project No. 1954



INTRODUCTION

1.1 THE PROJECT

The Denman Road Solar Park is proposed at Lot 400 Denman Road, Muswellbrook, located 13 km southwest of Muswellbrook and 10km northeast of Denman. The land is primarily cleared, agricultural land used for grazing cattle and other livestock. The site and adjoining lands are zoned "Rural Use 1 – Primary Production" (RU1). The Development footprint of the Solar Park encompasses the whole 40 hectares (ha) of the Site and includes construction and operation of approximately 22MW (AC) photovoltaic (PV) arrays. It also involves associated electrical infrastructure, maintenance facilities, access tracks and minor upgrades to adjacent roads.

1.2 Scope

The scope of this landscape management plan includes:

- A brief description of the site and measures to achieve visual screening of the site from surrounding receptors.
- A description of the objectives of visual screening and minimise visual impact of the development
- Specifications for screen planting such as planting densities and likely growth rates to achieve three (3) years screening requirements
- A management framework to maintain, protect and monitor screen planting after plant establishment period.

1.3 Objective of the Landscape Plan and Management Strategies

The overall objective of the proposed visual mitigation is to accomplish an integrated solar park and retain the existing landscape character at a local and regional scale. The recommended landscaping aims to reduce the visual impact of the proposed development while maintaining the existing rural landscape character of the site. Some key factors include compliance with strategies recommended in the Statement of Environmental Effects, ensuring the expectations of the surrounding landowners and residents are met, and the plants are established and maintained throughout the operational lifetime of the development. In accordance with the objectives listed above: -

- A healthy and suitable visual screen will be planted consisting of native endemic species which require minimal or moderate watering (listed in the planting schedule).
- Proposed landscaping may be effective at screening the development from surrounding receptors within three (3) years of commencement of the construction phase.
- Be maintained effectively with industry standard weed management practices.
- Achieve effective and natural looking vegetation screen that integrates into its surroundings.
- Maintain a seeded turf buffer to provide visual security along the fence line.

After the three (3) years maintenance period the screening buffer is required to be managed through occasional weed control, trimming and monitoring. Intensive management over the three-year period will enable self-sustenance and assist the vegetation in developing into the desired form and habit to screen the project from key public domain locations.

The location of buffer planting and seeded turf must be followed as indicated on the approved landscape plans prepared by Moir Landscape Architecture **Ref: 1954 Denman Road Solar Park Landscape Development Application Documentation dated 27th November 2020 Rev B**

1.4 Planting Schedule

Indicative Planting Schedule

Code	Botanical Name	Common Name	Pot Size	Mature Height	Mature Width	Notes
Trees						
ACM smi	<i>Acmena smithii</i>	Lillypilly	200 Litre	4 - 7m	4 - 6m	
CAL sal	<i>Callistemon salignus</i>	Willow Bottlebrush	200 Litre	5 - 6m	3.5 - 6m	
COR nan	<i>Corymbia eximia</i> 'Nana'	Dwarf Yellow Bloodwood	200 Litre	5 - 6m	4 - 6m	
ELA ret	<i>Elaeocarpus reticulatus</i>	Blueberry Ash	200 Litre	5 - 8m	4 - 6m	
SYZ aus	<i>Syzygium australe</i>	Brush Cherry	200 Litre	5 - 8m	4 - 6m	
TRI lus	<i>Tristanopsis laurina</i> 'Luscious'	Water Gum	200 Litre	5 - 7m	4 - 6m	
Shrubs						
BUR spi	<i>Bursaria spinosa</i>	Sweet Bursaria	25 Litre	3 - 4m	1.5 - 2.5m	
CAL lin	<i>Callistemon linearis</i>	Narrow-leaved Bottlebrush	25 Litre	3 - 4m	2 - 3m	
COR alb	<i>Correa alba</i>	White Correa	25 Litre	0.9 - 1.5m	0.9 - 1.2m	
DOD vis	<i>Dodonaea viscosa</i>	Giant Hop Bush	25 Litre	1.5 - 3m	2.0 - 3.5m	
MEL nod	<i>Melaleuca nodosa</i>	Prickly Leaved Paperbark	25 Litre	2 - 3m	2.5m	
MP1 Mass Planting						
AUS cae	<i>Austroanthonia caespitosa</i>	Common Wallaby-grass	Tubestock	0.3 - 0.45m	0.3 - 0.6m	3 per m ²
DIA cae	<i>Dianella caerulea</i>	Blue Flax-lily	Tubestock	0.45 - 0.6m	0.3 - 0.6m	3 per m ²
LOM lon	<i>Lomandra longifolia</i>	Spiny-headed Mat-Rush	Tubestock	0.6 - 0.9m	0.4 - 0.6m	3 per m ²

NOTE:

MATURE HEIGHTS SHOWN ARE INDICATIVE ONLY. CONTRACTOR TO ENSURE TOTAL HEIGHT OF TREES TO BE MAINTAINED TO PREVENT SHADING ONTO THE SOLAR PANELS

1.5 Managed Zones

To achieve the objectives as outlined in the approved landscape plans the proposed landscaping has been delineated into three (3) zones to ensure effective management of planting and effective establishment works.

These have been identified as: -

- Zone 1: 10m wide landscape buffer planted with native species to achieve dense screening and reduce visual impact to surrounding receptors, and existing planting retained and supplemented with additional landscaping where required. (Z1)
- Zone 2: 10m wide firebreak planting with 2m wide buffer area with seeded turf. (Z2)
- Zone 3: Routine vegetation management and monitoring in module areas with consideration to allow small livestock such as lambs and sheep. (Z3)

1.6 Contractor and staff nomination

Contractor with experience in standard maintenance practices shall be appointed to report, receive and carry out instructions to and from the Site Superintendent. If instructed by the Site Superintendent, the Contractor must attend to certain areas and procedures as a priority and obtain approval for additional costs prior to commencement of works.

1.7 Reporting

During the plant establishment period the Contractor shall submit reports quarterly for the first year and every six months for the next two years as per the Reports schedule (Appendix A) to highlight the below:

- General status of the works
- Any plant supplementation requirements
- Dated photos of key issues and effective responses
- Observing results and contingencies executed to address failures

All inspection reports must include monitoring for Z1, Z2 AND Z3.

1.8 Logbook

A 'Maintenance Log' is to be completed by the contractor verifying that satisfactory maintenance of the works has been undertaken and that any necessary rectification measures have been carried out to a high professional standard. All works undertaken are to be recorded with reference to the Maintenance schedule.

The 'Maintenance Log' is to be available at any time to the Client and Site Superintendent.

1.9 Recurrent Works

Throughout the Plant establishment period, continue to carry out recurrent works of a maintenance nature including but not limited to, watering, mowing, weeding, rubbish removal, fertilising, pest and disease control, staking and tying, replanting, cultivating and pruning. All rubbish related to landscape works shall be removed by the Landscape Contractor before it is allowed to accumulate.

1.10 Turf Areas

Monitoring and implementing watering, weeding, fertilising and any other activities required to ensure good establishment of the turf must be undertaken.

EXECUTION

General

2.1 Weeding

Any species likely to significantly invade the vegetation management area, prevent natural regeneration, or impede seed growth is to be targeted for removal. Species considered as weeds within the Muswellbrook Shire Council area and listed under the National Significance and Biosecurity Weeds to be given priority.

2.2 Vegetation Management to reduce Bushfire Risk

The nominated Landscape Contractor must ensure that essential efforts are undertaken to reduce the bushfire risk to the proposed solar park and associated amenities. These may include but are not limited to ensuring there is no accumulation of fine debris close to the development, removal of understorey fuel loads to limit flame heights and canopy fire and thereby reduce overall radiant heat and removal of loose bark and fine fuels.

Management and monitoring to be done quarterly during the Planting Establishment Period and at increased frequency during the hot dryer months. Contractor shall carry out regular checks to: -

- Ensure areas under and around fences, fence posts, gates and trees are raked and cleared of fuel.
- Monitor planting areas for loose litter such as pieces of loose bark, leaves and branches which could potentially generate embers.
- Ensure tree canopies are not continuous at maturity by maintaining 2-5m gaps between the canopies.
- Ensure planting is as per the approved landscape documentation and in accordance with the RFS Bushfire Regulations.
- Remove litter and leaves from paths and access roads to ensure good condition in case of a bushfire event.
- Woodpiles and rubbish consisting of combustible fuels to be located away from development and tree canopies.
- Shrubs are planted in-between tree canopies and pruned to maintain a sufficient distance from adjoining tree canopies.
- Grasses and groundcovers are to be maintained to a minimum height by slashing twice (2) a year as per the RFS Bushfire Guidelines.
- Ensure the mature planting areas are installed and maintained in accordance with the RFS's 'Standards for Asset Protection Zones' available at the RFS webpage at www.rfs.nsw.gov.au
- Trees and other vegetation under or in the vicinity of powerlines and tower lines should be maintained in accordance with the guidelines in "Vegetation Safety Clearances" issued by Energy Australia (NS179, April 2002)

2.3 Establishment procedures, Management actions and Monitoring responsibilities

Phase 1: Construction (Pre-planting)

Management Zone	Actions	Task description	Allocated Timeframe	Positive indicators	Frequency	Contingencies
Zone 1 – Perimeter Buffer screen planting	Contractor to Confirm plant list and order plants	- Approach and consult local plant nursery. - Order desired quantities and densities	Six months prior to commencement of plant installation	- Appropriate species are acquired by placing the order in advance - Contractor to produce evidence and include in six monthly report	Contact nursery to check progress monthly	Approach other nurseries within the region to procure unavailable stock
Zone 1 and Zone 3	Ripping planting lines 300-500mm deep	Ensure all vehicles entering the site are free of weeds Contact Dial Before You Dig to check for underground services Ensure ripping is carried out only in Z1	Prior to planting	Rip lines at desired depths for all zones	Checks depths and effectiveness of rip lines Include photos in six monthly reports Retain invoices as evidence and include in report	If deemed inadequate repeat ripping In severe weather conditions consider mechanical means
Zone 2 and Zone 3	Lightly raked soil and spreading the seed	Using mechanical methods lightly rake the soil and remove any rocks and debris	Prior to spreading	Lightly raked soil appears well mixed and rolled	Check raked soil and ensure good mix	Repeat raking if rocks and debris still visible
	Spreading	Using a spreader to achieve maximum coverage Set appropriate spreading rate (gm/m²) to achieve maximum coverage Lightly roll or walk over the area to ensure good soil contact	Ensure even spread of seed over the area for maximum coverage	Visible even dispersion over the designated area	Ensure seeds are in good contact with the soil Roll over the area to ensure seeds are not blown away by a stiff breeze	Lightly spread organic matter to protect seeds from fauna If visible discrepancies repeat the spreading cycle
	Watering	Keep soil moist by watering regularly and gently to ensure sprouting Reduce frequency once sprouts are visible	After spreading the seed to 4 weeks	Colour of the soil must be a darker tone and feel moist to the touch	2-3 watering cycles to get the soil wet or moist	If the soil appears two third lighter than when watered repeat watering cycle
	Mowing	Keep the seeded turf area to a minimum height to ensure visual security	First mow to occur after 8-10cm of visible sprouts	Sprouts visible in areas	3-6 weeks after spreading / planting	Mow only after turf is at a recommended height. Mowing should occur gently to ensure as new seedling are tender
	Fertilising	Lightly fertilise using a quality fertiliser	After the first mow	Healthy growth of turf	Until seed establishment	Do not over fertilise Use organic fertiliser

All zones	Weed spraying (Pre-planting)	Broad acre and spot spraying of annual grasses and weeds within planting zones following relevant standards and procedures	4-6 weeks prior to planting	Decline and reduction of live weed cover by 90%	Within the first two weeks of spraying inspect for effectiveness Dated photos of effectiveness and include in report Retain invoices if possible as evidence	Repeat spraying to achieve 90% reduction rate
All zones	Pest animal control	Inspect site for any pest animal warrens and treat as necessary	Prior to planting	No evidence of damage to plantings and no evidence of pests	Monitor site weekly during establishment period for evidence of pests	Consider effective control measure or fencing if pest animals continue to pose a threat to plantings
Zone 1 only	Planting and Guarding	Ensure planting is carried out at recommended densities within screening areas identified on the approved landscape plans. Stake and guard all trees and shrubs with standard tree guards or equivalent Ensure temporary guards or fencing around seeded turf to promote healthy growth	Planting and guarding to take place after installation	Successfully staked and guarded prior to commencement of construction	Inspect locations after planting every two weeks for signs of pests and animal damage Monitor and remove tree guards if deemed necessary	In dry conditions water plantings using water truck or similar methods Use 1.5m tall guards or netting if standard tree guards are insufficient

Phase 2: Construction and operation phase

Management Zone	Actions	Task description	Allocated Timeframe	Positive indicators	Frequency	Contingencies
Zone 1 – Perimeter Buffer screen planting	Monitoring to achieve satisfactory growth rates	Establish a minimum of one photo point in each management zone to demonstrate growth and screening effectiveness	Every three months after plant establishment	Satisfactory growth is achieved as per requirements	Document planting success every three months. Collate and monitor photo point and compile into six monthly report	If die back occurs determine the best performing species and use to achieve desired results
All zones	Watering	Regularly water juvenile plants to ensure proper establishment	Weekly over three months following planting	95% survival rate for planting vegetation following three months	Monitor for signs of drought stress in plants Document each watering cycle	If water is unavailable contact DPE to discuss other contingencies to achieve screen planting
All zones	Weeding	Spot spray along planting zones to reduce weed growth	Spray monthly for first 12 months then quarterly for three years	Screening area is 90% native vegetation	Within the first two weeks of spraying inspect for effectiveness Dated photos of effectiveness and include in report	Repeat spraying cycle if proven ineffective within 14 days

					Retain invoices if possible as evidence	
Zone 1 only	Pest animal control	Insect site for any signs of pest animals and conduct necessary physical or chemical treatments	Three times annually for three years	No visible evidence of damage to plants	Inspect locations after planting every two weeks for signs of pests and animal damage Retain invoices if possible as evidence	In dry conditions water plantings using water truck or similar methods Use 1.5m tall guards or netting if damage occurs
Zone 1 only	Infill planting	Replace any dead plants with new stock or with the best performing species	Monitor throughout the three-year period	Failed planting to be replaced to achieve 95% success rate	Inspect locations after planting every two weeks for signs of pests and animal damage	If die back occurs determine surviving best performing species and use to achieve desired results
Perimeter fencing	Monitor fencing	Ensure fencing is in good condition for effective security of the development	Quarterly after installation for three years	Gates and fences are in good working order and operate successfully to exclude livestock or pests	Dated photos to be included in six monthly reports	If required undertake repair works or engage contractor to remediate any issues

Phase 3: Operational Phase

Management Zone	Actions	Task description	Allocated Timeframe	Positive indicators	Frequency	Contingencies
All zones	Weeding	Spot spray within management zones to reduce weed growth	Spray twice annually as required or in response to weed issues	Screening area is 90% native vegetation	Within the first two weeks of spraying inspect for effectiveness	Repeat spraying cycle if proven ineffective within 14 days
Zone 1 only	Pest animal control	Insect site for any signs of pest animals and conduct necessary physical or chemical treatments	Twice annually or as required	No visible evidence of damage to plants	Inspect locations to monitor for damage	Implement more intensive fencing and tree guarding protocols if unsuccessful
Zone 3	Vegetation management	Managing vegetation within development site by allowing small livestock to graze like lambs and sheep	Inspect annually or as required	Assets are protected	Annually or as required	Ensure vegetation management techniques are monitored

REPORTS

Establishment Period – Within the first 12 months after planting – Quarterly reports on watering, weeding, die backs and effectiveness of corrective measures

Two years post planting – Six monthly reports to outline success of watering, weeding, plant supplementation and corrective measures.

Three years post planting – Annual reports to monitor success of watering cycles, weeding supplementation and corrective measure if any

Operation period – Annual reports or as required to ensure effective screening is maintained and achieved for the operational lifetime of the development

The following reports can be maintained or provided to Council as evidence towards compliance.

REFERENCES

ASLAT Consulting. *Denman Road Solar Park Statement of Environmental Effects*. ASLAT CONSULTING, 2020. Accessed 19 Mar 2021.

NGH ENVIRONMENTAL. *Manilda Solar Farm Landscape Plan*. NGH Environmental, 2016. Accessed 18 Mar 2021.

RURAL FIRE SERVICE (RFS). *Planning for Bushfire Protection*. RFS NSW, 2006. Accessed 19 Mar 2021

Department of Energy, Utilities and Sustainability. *ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets*. Department of Energy, Utility and Sustainability, 2016. Accessed 18 Mar 2021

1. Maintenance Report – Appendix A

Monthly Report Schedule

Item	Action	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plant material	Monitoring												
	Pruning (If required)												
	Tip Pruning												
	Fertilise												
	Cut back perennials and grasses												
	Watering as required												
Turf	Seeding												
	Treat for Disease												
	Weeding												
	Mowing/Trimming												
Rubbish Removal	Generally, remove bottles, paper, cigarette butts etc.												
	Remove leaves and litter from turfed areas, under trees, fences, gates and fence posts												
Fencing	Repair fencing												