West Wyalong Solar Farm

228-230 Blands Lane, Wyalong, NSW
Landscape Concept Design Report

Prepared by: Site Image Landscape Architects
In conjunction with: Urbis (Planning)

For: Lightsource Development Services Australia
21st January 2019

SITE IMAGE
Landscape Architects

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Introduction & Site Context

This report has been prepared to address the landscape design aspects for the proposed construction of a solar farm on the site of 228-230 Blands Lane, West Wyalong. This Landscape concept design report and allied plans has been prepared by Site Image Landscape Architects in close cooperation with Urbis Planners and associated project team members for Lightsource Development Services Australia Pty Ltd.

The site is approximately 694 acres and lies north east of West Wyalong, located within the Bland Shire Council. The site as per the DA includes Lots 17 and 18, where Lot 18 will contain the proposed solar farm. Surrounding landscape is generally that of rural landholdings and remnant vegetation. Existing vegetation on site is found largely along the rural road network, with most of the land having been cleared. There is a central grouping of remnant vegetation in the southern half of the site and as perimeter roadside planting.

The proposed solar farm will include the installation of solar panels, with a total height of each panel being 4.01m, giving the project capacity of 90 MW AC. The substation and battery located on site is to be 8m in height with an additional 18m lightning rod. The land under and around the solar panels will remain as pastural grass land, accommodating grazing. Access to the solar farm in Lot 18 will be via Lot 17.

This report and allied Landscape Plan describes and illustrates proposals including landscape protection, enhancement, new planting and treatments, and landscape maintenance and management strategies to achieve a long-term sustainable outcome suitable to the site and it's context.

In formulating the landscape proposals, Site Image has considered the detailed site investigation and assessments of consultants reviewing the broad range of landscape related features and factors including physical and landscape features, land-uses and ongoing management activities. This report has been prepared to be read in conjunction with project team documents that provide detailed documentation and analysis and visual impact assessment conclusions that have guided aspects of the proposed perimeter landscape treatments.

Site Context - Sixmaps


Typical view along Blands Lane


Typical view along Southwestern boundary


Typical view along Myers Lane


Typical view along Northeastern boundary

Landscape Design Considerations

Comprehensive site analysis of the ecology, hydrology and existing site features and vegetation was completed by the project team members including landform and drainage; archeological significance review; structures and farm elements; roads and fences; trees and vegetation associations; fauna and ecological corridors; and services and farm infrastructure. Bushfire assessment included review of context and bushfire threat, and consideration of minimising threat, suitable asset protection fire fighting setbacks and access provision, as well as ongoing vegetation and site management.

The context has been considered in these studies, including adjoining land holdings and relationship to the site; shared boundary to the south-west and north-east; provisions for irrigation and relevant to this project is the proximity to the HV network to the east of the site. Context considerations also included review of flight paths of light aircraft from the nearby airstrip and more general aviation patterns. Visual analysis was also a key aspect of review of the site and its context and relationship to neighbours and potential views to the site. Synthesis of the solar farm layout and arrangement was completed on the basis of integrated analysis of the team findings relating to these elements. Remnant significant vegetation were key considerations, with proposed solar panel and access arrangements allowing retention and protection of these elements.

Consideration and analysis of these factors was undertaken in response to achieving the outcomes of the client design brief, which has been developed to achieve required energy generation and distribution to the network, and achieve a suitable response to the factors noted above that have been addressed on previous similar project in the western NSW region. This includes incorporating landscape buffer treatments commonly undertaken to the site elements and interface with protected landscape areas, and perimeter landscape protection and additional planting to achieve visual buffer treatments as identified in the visual assessment study.

Site Boundary

Lot Boundary

Vegetation to be retained and protected

Landscape Strategy - Planting Proposals

In response to the site factors identified and the landscape buffer treatments suggested in the visual impact assessment study, the landscape proposals are described below and in accompanying landscape drawings.

Within the site boundary, there is to be a perimeter fire buffer zone at a minimum of 15 metres, that is clear of any vegetation. Outside of this fire buffer zone is to be landscaped with buffer planting, coordinating with the requirements of the ecologist report and the visual impact assessment. In the south western corner of the site, there is a 100 metre wide flight clearance buffer adjoining the NSW Free Flight Society land which is approximately 1.4 kilometres in length.

A 3 metre wide screen planting is proposed for 100 metres along the north eastern boundary corner .

Infill Planting to be installed maintaining a 3 metre wide boundary screening along the remaining site edges, except along the flight society fl ight clearance buffer. Infill planting to match surrounding retained vegetation.

Planting species selected must have minimum trunk clearance of 300mm from the ground, and not overshadow solar panels. Proposed planting species will be largely comprised of dominant species already found on site, and supplementary planting from a selection of endemic species. As per PBP and Standards for Asset Protection Zones, Trees must have clear trunk to height of 2 metres, and tall - medium shrubs be maintained to be clear of the tree canopy to ensure vertical stratification. Landscape to be planted in clumps and not provide continuous vegetation or canopy.

All environmental weeds found on site to be removed prior to landscape install, particularly those listed under the NSW Biosecurity Act 2016.

Solar panels are to have pastural grass surrounding and growing underneath, and be maintained through slashing or grazing.

Pastural grass mix is to be based upon Department of Primary Industries nominated mixes for the West Wyalong District, and determined by specific soil type found on site.

There is currently an existing seasonal tributary water course crossing through the northern portion of the site, as well as existing vegetation found in the southern half of the site. Both the seasonal tributary water course and existing vegetation are to be retained.

Existing vegetation along the perimeter of the site is to be retained where possible and be supplemented with infill planting.

Plant failure is expected and acceptable rates are as follows:

Tube stock - Per area: <10%

Concentration of failure: <15%

Trees - Per area: nil

Concentration of failure: nil

Refer to the Ecologist Consultants report for detailed information regarding fauna and flora VMP proposals, establishment and ongoing landscape maintenance and management.

Site Boundary

Proposed landscape buffer planting - Large shrubs & trees (3m wide)

Vegetation to be retained and protected

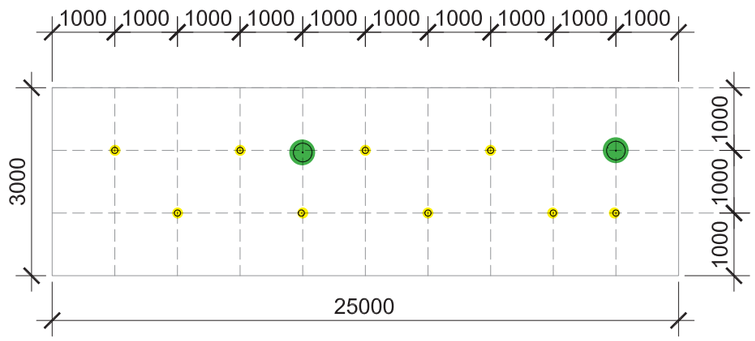
Existing vegetation retained, protected and enhanced with infill planting, where required (3m wide)

Landscape Strategy - Indicative Plant Species

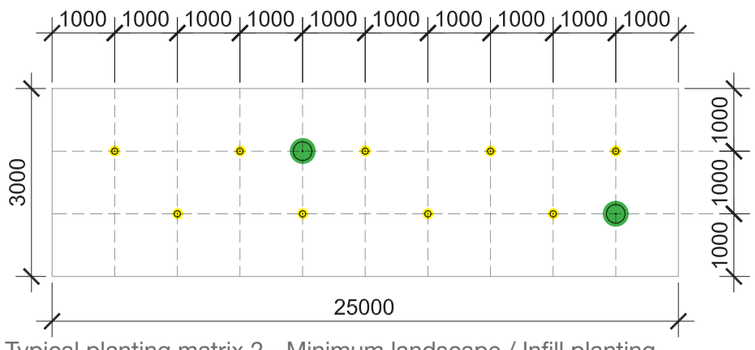
RECOMMENDED PLANT SPECIES

Tree Species	**Mature Height x Width**
Eucalyptus behriana (Bull Mallee)	10m x 5m
Callitris glaucophylla (White Cypress)	14m x 5m
Casuarina cristata (Belah)	10m x 3m
Eucalyptus sideroxylon (Mugga Ironbark)	15m x 7m

Shrub Species	
Acacia oswaldii (Umbrella Wattle)	2m x 2m
Acacia pendula (Weeping Myall or Boree)	5m x 3m
Acacia salicina (Sally Wattle)	4m x 3m
Acacia trineura (Three-nerve Wattle)	2m x 3m
Dodonaea viscosa (Sticky Hop-bush)	2m x 2m
Eremophila mitchelli (False Sandalwood)	6m x 4m
Geijera parviflora (Wilga)	4m x 4m
Melaleuca lanceolata (Black Teatree)	3m x 4m



Typical planting matrix 1 - Perimeter landscape zone



Typical planting matrix 2 - Minimum landscape / Infill planting

TREES

Eucalyptus behriana (Bull Mallee)

Callitris glaucophylla (White Cypress)

Casuarina cristata (Belah)

Eucalyptus sideroxylon (Mugga Ironbark)

LARGE SHRUBS

Acaia oswaldi (Umbrella Wattle)

Acacia pendula (Weeping Myall)

Acacia salicina (Sally Wattle)

Acaia trineura (Three Nerve wattle)

Dodonea viscosa (Hopbush)

Eremophila mitchellii (False Sandalwood)

Geijera parviflora (Wilga)

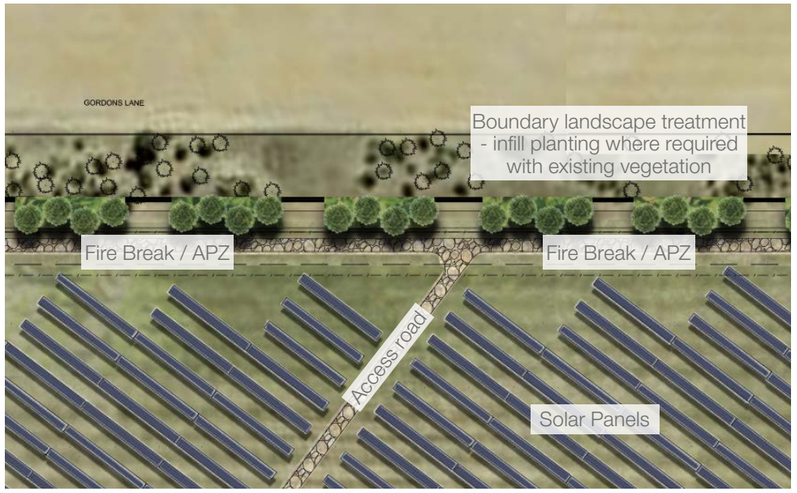
Melaleuca lanceolata (Black Teatree)

Perimeter landscape to be 3m in width and typically follow planting matrix 1. Matrix to be repeated twice, followed by a gap to create clumping landscape.

Minimum landscaped zones to be 3m in width, generally where infill planting is required among existing vegetation. Typically follow planting matrix 2, however must be adjusted to suit site conditions and existing vegetation, and species chosen are to match surrounding retained vegetation.

Landscape Masterplan - Summary of Landscape Proposals

This plan and annotated notes provides a summary of landscape proposals formulated with the project team to provide a suitable landscape setting to the solar farm elements, achieve required vegetation protection and enhancement, and provide suitable landscape buffers as identified in the visual impact assessment report.

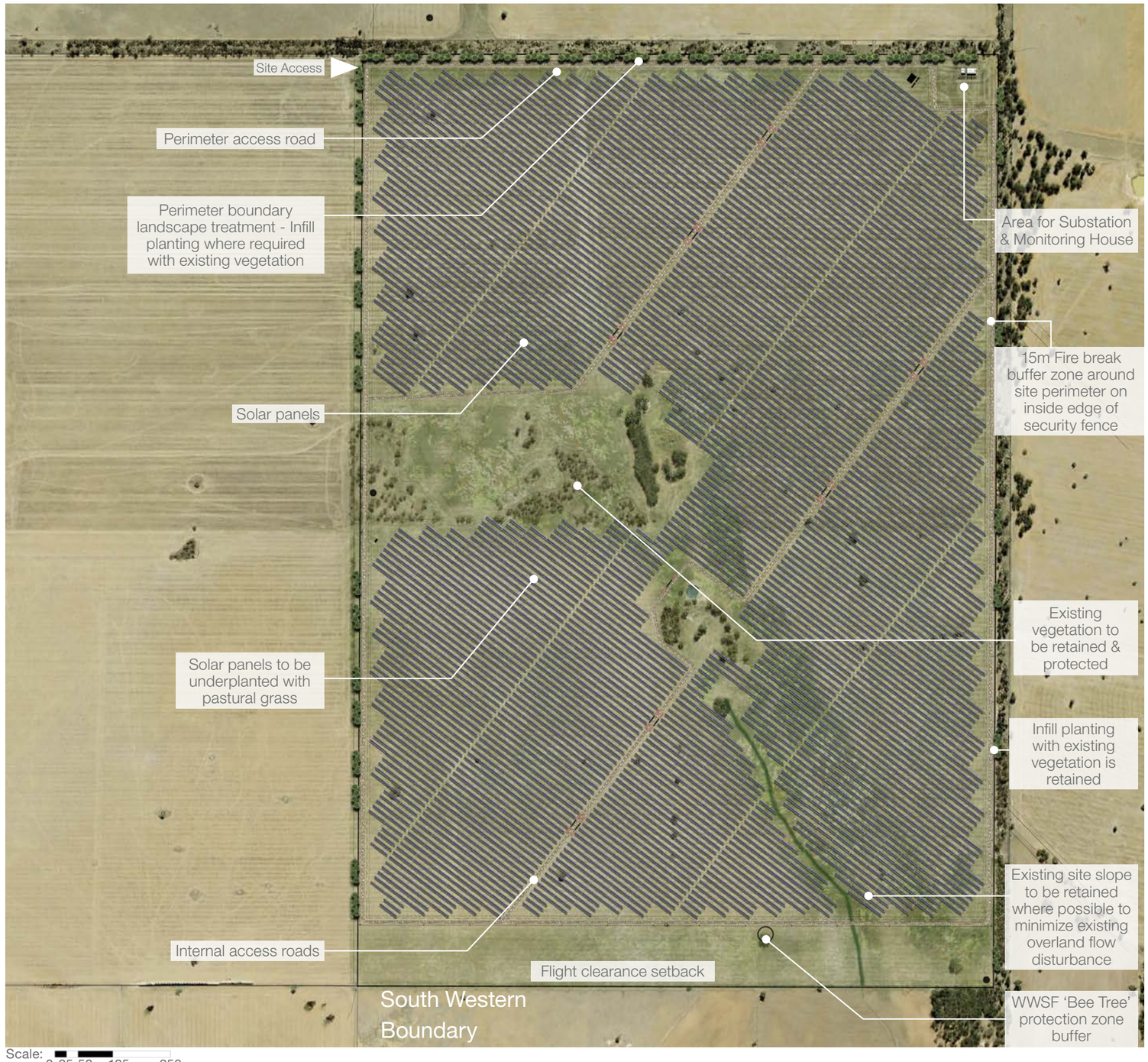


Typical landscape boundary treatment with infill planting where required with existing vegetation

Scale: 0 25 50

Typical landscape infill planting where required with existing vegetation

Scale: 0 25 50



Scale: 0 25 50 125 250

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West Wyalong Solar Farm | Landscape Masterplan

Client	Lightsource Development Services Australia	Drawing Number	6
Planner:	Urbis	Issue	1
Site Image Job Number	SS18-3924	Date	21.01.2019

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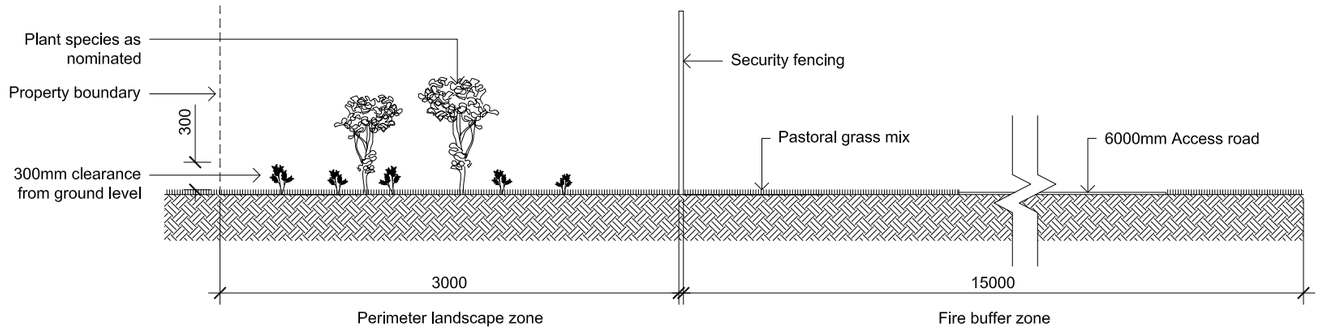
Planting Design

In response to the site factors identified and the landscape buffer treatments suggested in the visual impact assessment study, the landscape proposals are described in the adjacent sections and elevations, and in accompanying landscape masterplan drawings.

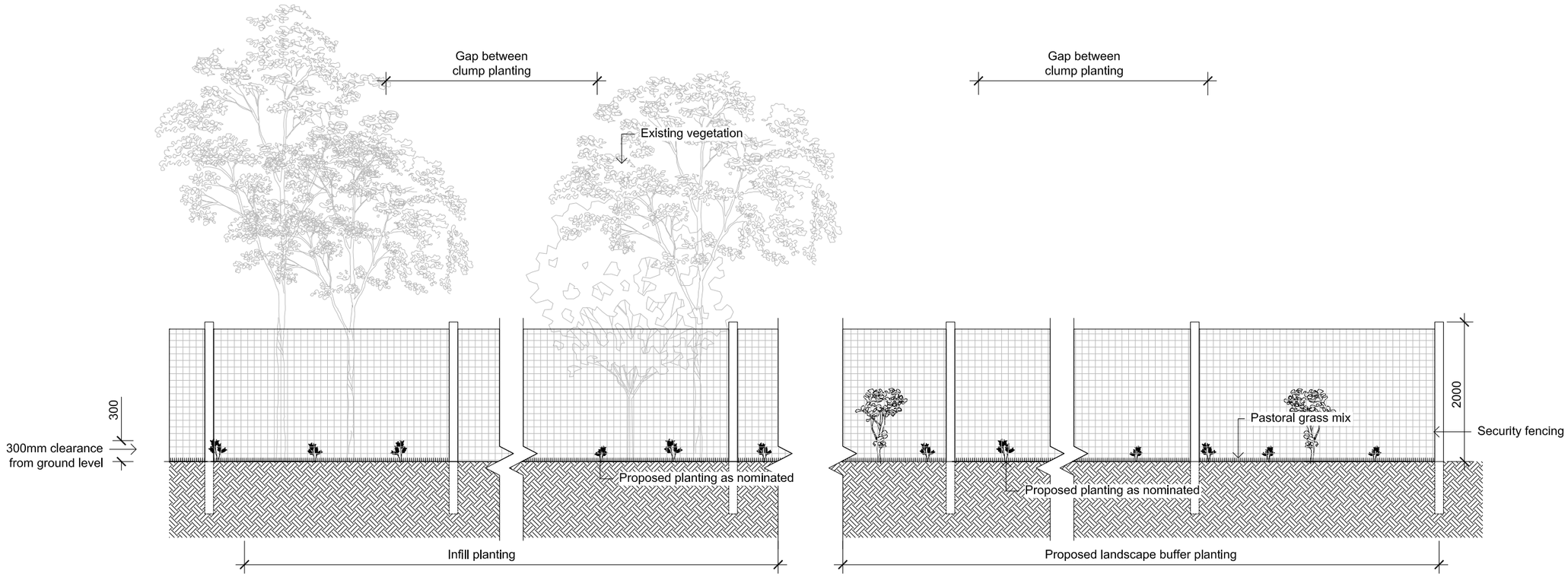
The sections demonstrate the key circumstances and treatments, relating to:

Section 1: Day 1 Typical boundary setback and buffer planting, secure fencing, and fire buffer break. Shrub planting is installed at a higher density to allow for 10% failure rate.

Elevation 1: Day 1 Typical landscape buffer planting showing new planting supplementing existing vegetation, and after the break-line showing typical buffer planting. Trees and surrounding shrubs installed in clump style planting where buffer planting is proposed, and as required when installed as infill planting.



Section 1: Day 1 typical boundary setback and buffer planting, secure fencing, and fire buffer zone



Elevation 1: Typical landscape buffer planting showing new planting supplementing existing vegetation, and typical buffer planting.

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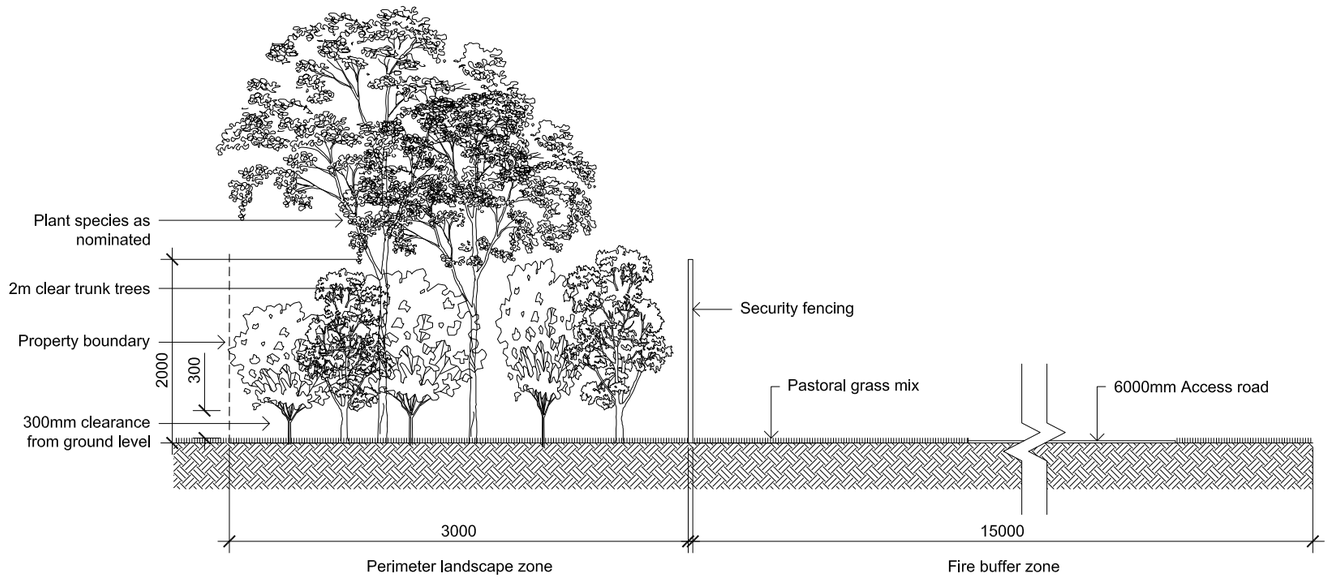
Planting Design

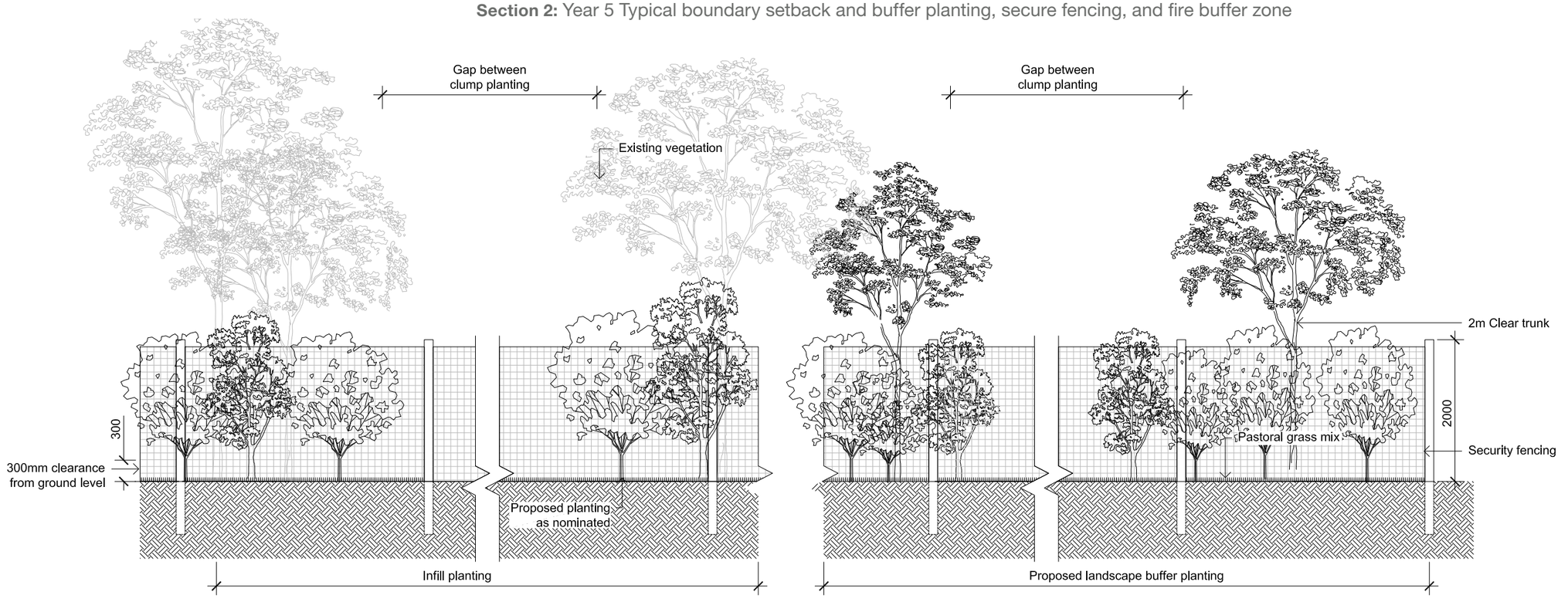
Section 2: Year 5 Typical boundary setback and buffer planting, secure fencing, and fire buffer break. Shrubs shown to have naturally progressed spacing in their clump planting.

Elevation 2: Year 5 Typical landscape buffer planting showing new planting supplementing existing vegetation, and typical buffer planting. Trees shown to have 2m clear trunks and shrubs below the tree canopy line.

Trees are projected to grow to between 4-6m in this initial 5 year period, however mature growth and habit is only a general indication. The expected growth of trees and shrubs will vary between species selected, maintenance, individual natural variation and microclimate.



Section 2: Year 5 Typical boundary setback and buffer planting, secure fencing, and fire buffer zone



Elevation 2: Year 5 typical landscape buffer planting showing new planting supplementing existing vegetation, and typical buffer planting.

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LANDSCAPE MAINTENANCE

Workmanship and Materials

The whole of the landscape works shall be carried out by a competent, trained and qualified landscape contractor who is experienced in horticultural practices, landscape construction and planting techniques. The landscape contractor shall hold a current Building Contractors License and/or be a financial member of LNA Landscape Association NSW & ACT or equivalent organisations in other states.

EXISTING TREES AND SHRUBS

Trees and Shrubs to be Retained and Protected

Identify and mark trees and shrubs to be retained using a suitable non-injurious, easily visible and removable means of identification. Protect from damage the trees and shrubs to be retained, including those beyond the site area, both above and below the ground. If a tree becomes damaged during the works or it is proposed to perform work on a tree, give written notice immediately and obtain instructions.

Work Near Trees and Shrubs

Keep the area of the drip-line free from construction material and debris. Do not place bulk materials and harmful materials under foliage canopies or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown building materials, such as cement, from covering trees and other plants. Do not remove topsoil from, or add topsoil to, the area within the drip-line of trees.

SOFTWORKS

Site Soil Testing

Where site soil is to be retrieved from site and stored on site for reuse, undertake at least two (2) soil tests in locations as advised by the Project Manager or as shown on the plans. Provide results and recommendations regarding soil additives for the benefit of healthy plant growth and to adjust the soil components to achieve an appropriate planting medium for successful plant development.

Topsoil

Import topsoil for the landscape areas, unless the topsoil can be provided from material recovered from the site, as recommended in the soil testing results. Spread the topsoil on the prepared subsoil and grade evenly, compact lightly and uniformly in 150mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to design levels, allowing for mulch which is to finish flush with adjoining hard surfaces such as paths and edges;
- Smooth and free from inorganic matter, stones or clods of soil;
- Graded to drain freely, without ponding, to catchment and/or sub-soil drains;
- Graded evenly to adjoining surfaces; and
- Ready for planting.

Fertiliser

Provide proprietary fertilisers, delivered to the site in sealed containers marked to show manufacturer or vendor, weight, fertiliser type, N:P:K ratio, recommended uses, application rates and safety procedures. Apply appropriate fertiliser suited to the provenance of plants (indigenous or exotic) included in the design.

Plants

Supply plants in accordance with the landscape design drawings and schedules, which have the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage;
- Vigorous, well established, free from disease and pests, of good form consistent with the species/variety;
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site in full sun, partial shade or full shade conditions;
- Grown in final containers for not less than twelve weeks;
- Trees, unless required to be multi-stemmed, shall have a single leading shoot; and
- Containers shall be free from weeds and of appropriate size in relation to the specified plant size.

Plant Installation

Following excavation of the planting hole, place and spread 15gms of wetting agent pre-mixed with one (1) litre of water. Place the plant correctly orientated to north or for best presentation. Backfill the planting holes with specified topsoil mixture. Lightly tamp and water to eliminate air pockets. Ensure that the backfill soil is not placed over the top of the root ball and that the root ball is not higher than the soil in which it is planted. Apply fertiliser, as specified around the plants in the soil at the time of planting.

Landscape can be installed at anytime during the year. Optimal landscape installation period would be between end of winter through to spring when plants are actively growing.

Mulch

Unless noted otherwise, mulch shall be approved proprietary recycled wood fibre or pine bark material. Place mulch in all landscaped areas to a depth of 75mm after all specified plants are installed. Keep mulch clear of all plant stems and rake to an even plane, flush with the surrounding surfaces and evenly graded between design surface levels. Over fill to allow mulch to settle to the specified depth.

Stakes and Ties

Stakes shall be durable hardwood, straight, free of knots and twists, pointed at one end, in the following quantities and sizes for each of the various plant pot sizes:

- Plants >25 lt: 1 off 38 x 38 x 1200mm;

IRRIGATION

Landscape will primarily be passively irrigated, and plant species selected will have low water requirements. During install and establishment period, landscape will be irrigated via water truck.

LANDSCAPE MAINTENANCE

The Landscape Contractor shall rectify defects during installation and that become apparent in the works under normal use for the duration of the contract Defects Liability Period. Unless contracted otherwise, the Landscape Contractor shall maintain the contract areas by the implementation of industry accepted horticultural practices for 52 weeks from Practical Completion of the works. The landscape maintenance works shall include, but not be limited to:

- Replacing failed plants;
- Insect and pest control;
- Maintaining and removing stakes and ties;
- Irrigation and watering;
- Weeding and rubbish removal.

Maintenance Log Book

Implement and keep a maintenance log book recording when and what maintenance work has been undertaken and what materials, actions and decisions have been used, implemented and concluded to keep the landscape always looking its best. Enter data daily and review information every 2 weeks. Observe trends and develop a maintenance regime around seasonal and observed event occurrences.

Maintenance Activities

During the defects maintenance period schedule the following activities to occur on a timely basis.

- Plant replacement - Replace plants that have failed to mature, die or are damaged. Replacement plants shall be in a similar size and quality and identical species or variety to the plant that has failed. Replacement of plants shall be at the cost of the landscape contractor unless advised otherwise. If the cause of the failure is due to a controllable situation then correct the situation prior to replacing plants. Observe and replace failed plants within 2 weeks of observation.
- Pruning – Prune dead wood, broken limbs, dead or infected foliage and as needed to develop strong, healthy plants to achieve the shape and form expected of the plant type. Observe daily and prune plants on a needs basis.
- Insect, disease and pest control - Avoid spraying:
  - o if ever possible;
  - o in wet weather or if wet weather is imminent;
  - o if target plants are still wet after rain;
  - o in windy weather; and
  - o if non-target species are too close.

Immediately report to the Project Manager any evidence of intensive weed infestation, insect attack or disease amongst plant material. Submit all proposals to apply chemicals and obtain approval before starting this work. When approved, spray with herbicide, insecticide, fungicide as appropriate in accordance with the manufacturers' recommendations. Observe daily and act as necessary to control any infestation or disease. Record in the logbook all relevant details of spraying activities including:

- o Product brand / manufacturer's name,
- o Chemical / product name,
- o Chemical contents,
- o Application quantity and rate,
- o Date of application and location,
- o Results of application, and
- o Use approval authority.

- Stakes and ties - Adjust and replace as required to ensure plants remain correctly staked. Remove those not required at the end of the planting establishment period (Defects Liability Period). Inspect and act at least every 2 weeks.

END

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Appendix A - Landscape Masterplan

The Landscape Masterplan is included in this report for illustrative purposes, and accompanies this report as a A1 drawing at scale 1: 5,000. This plan demonstrates the proposed Solar Farm elements, retained and enhanced landscape features of the site, and proposed landscape treatments. The detail of proposed landscape treatments is to be expanded in the detailed design and documentation project stages to reflect the concept proposals as described. The developed plans will be at a suitable scale on a series of plans to cover typical treatments as well as enlarged precinct areas for specific detailed areas as is appropriate.

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Landscape Masterplan