

Landscape Vegetation Survey for Atlantis Childcare Centre

10 Harbour Elbow, BANKSIA GROVE



Site – 10 Harbour Elbow, Banksia Grove - Aerial photo & Cadastral

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Brief

The Client "Atlantis Childcare Centre" commissioned eScape landscape architecture to consult, inspect and complete a report to meet council's requirements for a landscape plan & tree survey to be completed as part of the planning approval submissions which forms part of the resubmission to council for the proposed childcare facility at the site address.

The site located in Banksia Grove in the City Of Wanneroo, Adjacent Neaves road and Old Yanchep Road. The block is 5003m² with an existing house, shed, and established gardens currently on the block. The client proposes to use the property for a new childcare centre.









The objective of the survey was to assess the existing native remanent vegetation based on the preliminary works plan and provide a basis for a suitable landscape plan outlining the retention and removal of trees and vegetation. Key to this plan is the orientation and location of the building and the carpark, egress to and from the building, situated play spaces, and suitable buffering from adjacent properties. The survey is to establish the trees species, size, condition and location.

Approach

This eScape landscape architecture obtained a preliminary works plan from the client along with a feature survey, positioning the trees accurately on the site along with the proposed carpark location and proposed building outline. A visual site assessment of the trees was then undertaken to determine the species, size of canopy, health and suitability for retention. A Landscape Vegetation Study and a Tree Removal Plan was then completed to help facilitate the landscaping concept masterplan for submission to council along with the other consultant's reports.

Site - Existing Tree Species

The site has a number of well-established native trees generally in good to fair condition. A number of dead trees are present marked on the *Landscape Vegetation Study* and some species marked for removal due to their unsuitability on the *Landscape Tree Removal Plan* i.e. Acacia species. The botanical name and common name, condition and notes are referred to in the schedule below and on the tree survey plan.

TREE SCHEDULE			
BLOCK	CODE	SPECIES	NOTES - SITE ASSESSMENT
	BANKSIA	CANDLE BANKSIA <i>Banksia attenuata</i>	Generally good condition, requiring clean up and crown lift, some mildew on leaves requiring treatment. 2 x <i>Banksia Menziesii</i> marked "BANKSIA MEN" suggest trees to fall in non irrigated areas if possible due to susceptibility to irrigation.
	SHEOAK	COMMON SHEOAK <i>Allocasuarina fraseriana</i>	Generally good condition, requiring clean up and crown lift and removal of dead wood.
	JARRAH	JARRAH <i>Eucalyptus marginata</i>	Generally good condition, no die back present. 5 x large multi trunk sentinel trees (habitat specimens), x Marked Feature Jarrah, small trees retained for shade in key areas and suitable for shade free adjacent play spaces.
	ACACIA	GOLDEN WREATHED WATTLE <i>Acacia saligna</i>	Poor condition, poisonous species suitable for removal.
	MARRI	MARRI REDGUM <i>Eucalyptus cataphylla</i>	Generally good condition, suitable for shade free adjacent playspaces.
	OLIVE	OLIVE SPECIES UNKNOWN	Remnant orchard species suitable for transplant to kitchen garden/ chicken coop etc...
	FRUIT	MIXED FRUIT TREES REFER TO NOTES	Remnant orchard species suitable for transplant to kitchen garden/ chicken coop etc...
	GRASS TREE	GRASS TREE <i>Xanthorrhoea preissii</i>	Various small - medium single headed grass trees, suitable for transplant into more suitable areas where removal is required. Suitable for transplant in garden areas away from kids eye level.
	MACROZAMIA	MACROZAMIA <i>Macrozamia riedlei</i>	Various medium macrozamia sporadically dotted through verge and tree lines. Suitable for transplant in garden areas away from kids eye level.

Tree Health

Good – The tree demonstrates good or exceptional growth for the species. The tree exhibits a full canopy of foliage. Minor pest or diseases problems. Foliage colour, size and density should be typical of a healthy specimen.

Fair - The tree demonstrates adequate growth for the species. The tree exhibits an adequate canopy of foliage. There may be some dead wood present in the crown, some grazing by insects, animals and foliage colour and size atypical for a healthy specimen of that species.

Poor - The tree is not growing to its full capacity, extension growth of the laterals may be minimal. The tree exhibits a thinning or sparse canopy of foliage. Large amounts of dead wood present in the crown, significant grazing by insects indicating the stress of the tree declining.

Very Poor – The tree appears to be in a state of decline and the canopy maybe very thin and sparse. Significant volume of deadwood may be present in the canopy and pest and disease problems causing a severe decline.

Dead – The tree is dead



Landscape – LC – 01- Development & Bushfire Response – Tree Survey



NOTE:
REFER TO LANDSCAPE REPORT FOR
FURTHER DETAILS REGARDING
TRANSPLANTING, TREE RETENTION
& PROTECTION, SPECIES
LIST ETC.

- PP POWER POLE
- SP STAY POLE
- SW STAY WIRE
- HYD HYDRANT
- MHS WATER CORP MANHOLE

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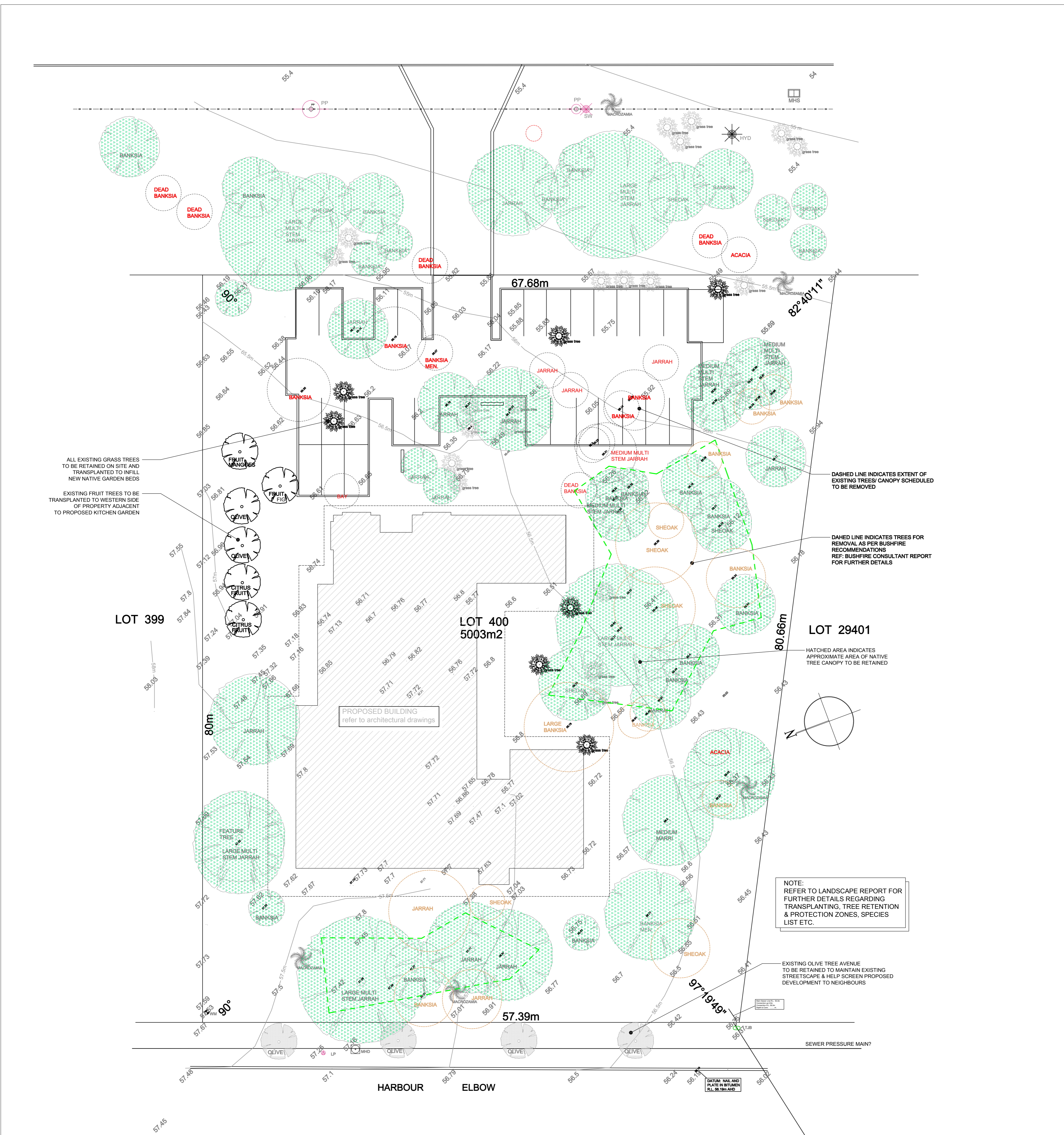
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BLOCK	CODE	SPECIES	NOTES - SITE ASSESSMENT
BANKSIA	CANDLE BANKSIA	Banksia attenuata	Generally good condition, requiring clean up and crown lift - some minor no leaves. requiring treatment 2 x Banksia Menziesii marked "BANKSIA MEN" suggest trees to fall in non irrigated areas if possible due to susceptibility to irrigation
SHEOAK	COMMON SHEOAK	Allocasuarina fraseriana	Generally good condition, requiring clean up and crown lift and removal of dead wood
JARRAH	JARRAH	Lucyptus marginata	Generally good condition, no die back present, 5 x large multi trunk sentinel trees (highlight specimens) - Marked Feature Jarrah, small trees retained for shade in key areas and suitable for shade tree adjacent play spaces
ACACIA	GOLDEN WREATHED WATTLE	Acacia saligna	Poor condition, poisonous species suitable for removal.
MARRI	MARRI REDGUM	Lucyptus calophylla	Generally good condition, suitable for shade tree adjacent playspaces
OLIVE	OLIVE SPECIES UNKNOWN		Remnant orchard species suitable for transplant to kitchen garden/ chicken coop etc.
FRUIT	MIXED FRUIT TREES REFER TO NOTES		Remnant orchard species suitable for transplant to kitchen garden/ chicken coop etc.
GRASS TREE	GRASS TREE	Xanthorrhoea preissii	Various small - medium single headed grass trees, suitable for transplant into more suitable areas where removal is required. Suitable for transplant in garden areas away from kids eye level.
MACRO ZAMA	MACROZAMA	Macrozamia riedlei	Various medium macrozamia sporadically dotted through verge and tree lines. Suitable for transplant in garden areas away from kids eye level.

DRAWN	N.CROWE	PROJECT	ATLANTIS CHILD CARE CENTRE 10 HARBOUR ELBOW, BANKSIA GROVE
SCALE	1:200 @ A1	TITLE	LANDSCAPE - DEVELOPMENT & BUSHFIRE RESPONSE TREE SURVEY
DATE	19.03.2019	CLIENT	B. HINDLE
LANDSCAPE ARCHITECT		SIZE	A1
		DRAWING NO.	I C-01
		REV	C



Landscape - LC- 02 – Development & Bushfire Response - Tree Removal Plan



ALL EXISTING GRASS TREES TO BE RETAINED ON SITE AND TRANSPLANTED TO INFILL NEW NATIVE GARDEN BEDS

EXISTING FRUIT TREES TO BE TRANSPLANTED TO WESTERN SIDE OF PROPERTY ADJACENT TO PROPOSED KITCHEN GARDEN

DASHED LINE INDICATES EXTENT OF EXISTING TREES/ CANOPY SCHEDULED TO BE REMOVED

DASHED LINE INDICATES TREES FOR REMOVAL AS PER BUSHFIRE RECOMMENDATIONS REF: BUSHFIRE CONSULTANT REPORT FOR FURTHER DETAILS

HATCHED AREA INDICATES APPROXIMATE AREA OF NATIVE TREE CANOPY TO BE RETAINED

NOTE: REFER TO LANDSCAPE REPORT FOR FURTHER DETAILS REGARDING TRANSPLANTING, TREE RETENTION & PROTECTION ZONES, SPECIES LIST ETC.

EXISTING OLIVE TREE AVENUE TO BE RETAINED TO MAINTAIN EXISTING STREETSCAPE & HELP SCREEN PROPOSED DEVELOPMENT TO NEIGHBOURS

- PP POWER POLE
- SP STAY POLE
- SW STAY WIRE
- HYD HYDRANT

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SYMBOL	QTY	TITLE	NOTES
	51x	NATIVE TREES TO BE RETAINED	Generally good condition. Some may require clean up, dead wood removed and crown lift where placed within proximity to play spaces for head clearance. 2 x Banksia Menziesii marked "BANKSIA MEN" signified some midlow on leaves require treatment?
	25x	NATIVE PLANTING RETAINED	Trim any dead or damaged leaves. Grass Tree leaves to be treated where within play space proximity
	4x	EXOTIC TREES TO BE RETAINED	Mature advanced Olive Tree avenue to be retained as form positive screen to Harbour Elbow
		TREE PROTECTION ZONE	Temporary fencing to be placed around trees to be retained to avoid any disturbance to roots and major limbs during construction
	11x	TREES TO BE REMOVED	5x Dead Banksia to verge; 2x Acacia (poisonous); 4x Jarrah; 5x Banksia & 1x Bay Laurel due to proposed report
	15x	TREES TO BE REMOVED (BUSHFIRE REG RECOMMEND)	5x Sheoak; 2x Jarrah & 1x Banksia to limit fuel, limit middle canopy and create 1m separation between tree clumps as per BAL 20 requirements. Refer to Bushfire Consultant report for further details
	6x	FRUIT TREES TO BE TRANSPLANTED	4x Fruit (2x Citrus, 1x Mango & 1x Fig) plus 2x Olive to be transplanted to new Kitchen Garden. Retain maximum root ball to limit stress. Fertilise well with organic matter
	7x	NATIVE PLANTING TO BE TRANSPLANTED	Various small - medium single headed grass trees, suitable for transplant into more suitable areas where removal is required. Suitable for transplant in garden areas away from kids eye level.

SUMMARY:
80x Native trees 13x exotic/ fruit trees existing = 93x Total
51x Native trees retained
32x Native feature planting retained
=74% Native species retained

DRAWN	N.CROWE	PROJECT	ATLANTIS CHILDCARE CENTRE 10 HARBOUR ELBOW, BANKSIA GROVE
SCALE	1:200 @ A1	TITLE	LANDSCAPE - DEVELOPMENT & BUSHFIRE RESPONSE TREE REMOVAL PLAN
DATE	19.03.2019	CLIENT	B. HINDLE
LANDSCAPE ARCHITECT		SIZE	A1
		DRAWING NO.	I C-02
		REV	C



Landscape – LC-03 - Development & Bushfire Response – Landscape Concept Plan



LANDSCAPE NOTE:
ALL IMAGES INCL. PLAYSPACES, PLANTING & ASSOCIATED VIBE IMAGERY ARE INDICATIVE ONLY FOR THE PURPOSES OF PLANNING IN ACCORDANCE TO FURTHER COMMUNICATE THE LANDSCAPE ARCHITECT'S DESIGN INTENT

GREENVALE PLACE



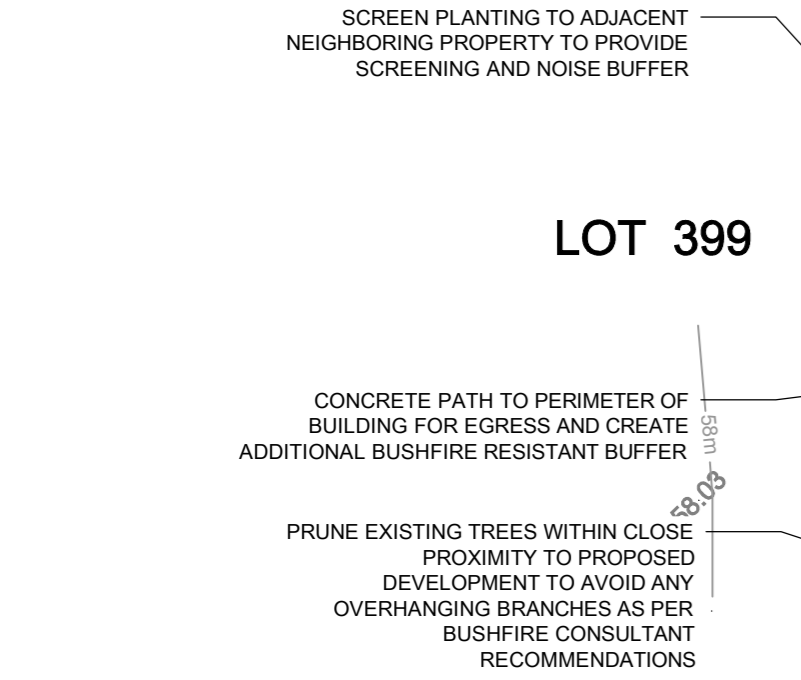
VERGE TREATMENT/ NATIVE GROUNDCOVER MIX



CARPARK PLANTING:



SCREEN PLANTING:



SCREEN PLANTING TO ADJACENT NEIGHBORING PROPERTY TO PROVIDE SCREENING AND NOISE BUFFER



MAIN PLAY SPACE FOR NURSERY & BABIES SUGGEST A RANGE OF LOW HEIGHT NATURAL FORMS TO LIMIT FALL RISK WHILE PROVIDING MIX OF SENSATIONS INTERSPERSED WITH COLOURED MATERIALS

NATURAL TURF AS VEGETATION BUFFER BETWEEN BUILDING & TREE CANOPY AS RECOMMENDED BY DFES/ BUSHFIRE REGULATIONS

GREY CONCRETE PATH AS TRAFFICABLE PATH FOR EMERGENCY EXIT AS RECOMMENDED BY DFES/ BUSHFIRE REGULATIONS



NATIVE MIX TO EXISTING TREE UNDERSTOREY (500mm MAX.)



EXPOSED AGGREGATE 'JARRAH'



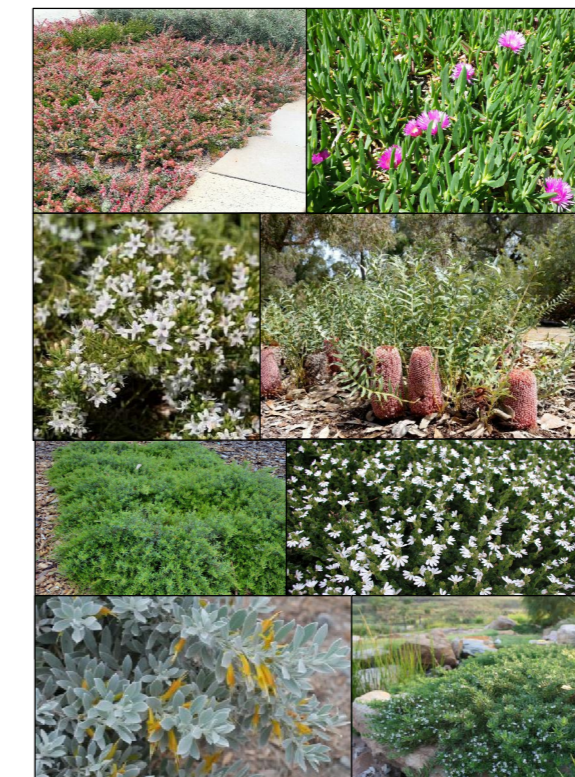
SUMMERSTONE FINES

NEW PLANTING NOTE:
63x 250mm SCREEN PLANTING TO NORTHERN & SOUTHERN BOUNDARIES
19x 45L TREES TO CARPARK AREA & SURROUNDS
1x 200L TREE AS INFL. CANOPY AS SHOWN
3x 200L TREES AS SCREEN TO CARPARK NORTHERN BOUNDARY
SUMMARY: 29x NEW TREES & 63x LARGE SHRUBS TO REPLACE TREE CANOPY REMOVED FROM DEVELOPMENT PLUS BUSHFIRE RECOMMENDATIONS
IRRIGATION NOTE:
- POP UP SPRINKLERS TO ALL LAWN AREAS OPERATION AS PER WATERCORP GUIDELINES.
- DRIP FEED WATERWISE RETICULATION TO ALL UNDERSTOREY AND TREE PLANTING

SHRUBS:



GROUNDCOVERS:



MATERIAL SCHEDULE

HATCH	MATERIAL
[Hatch symbol]	INITU CONCRETE - EXPOSED AGGREGATE
[Hatch symbol]	SUMMERSTONE FINES - GRANITIC SAND
[Hatch symbol]	HOTMIX ASPHALT - BROWN
[Hatch symbol]	IRRIGATED TURF AREA - SELECTED SPECIES
[Hatch symbol]	IRRIGATED - GARDEN BEDS SELECTED UNDERPLANTING
[Hatch symbol]	NON IRRIGATED - GARDEN BEDS INFL NATIVE TURFSTOCK
[Hatch symbol]	NON IRRIGATED - MULCH ONLY
[Hatch symbol]	GREY CONCRETE

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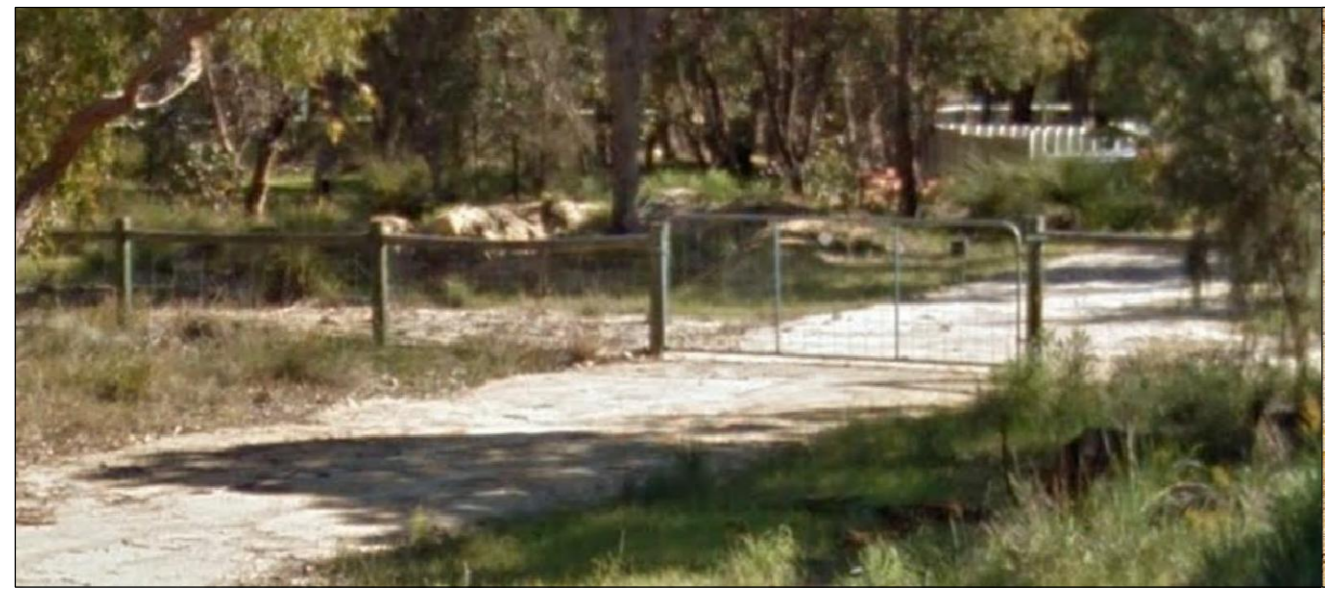
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SCALE	1:200 @ A1	TITLE	DEVELOPMENT & BUSHFIRE RESPONSE - LANDSCAPE CONCEPT
DATE	19.03.2019	CLIENT	B. HINDLE
LANDSCAPE ARCHITECT		SIZE	A1
		DRAWING NO.	IC-03
		REV	C



Landscape – LC-04 – Development – Fencing Plan

GREENVALE PLACE



FENCING SCHEDULE	
HATCH	MATERIAL
	LIMESTONE NATURAL BLOCK 1500h
	CCA TIMBER POST & RAIL 1000h w/ 1000h MESH (MATCH EXISTING)
	COLORBOND STEEL FENCE 1800h NOM. 'WOODLAND GREY'
	POWDERCOATED ALUMINIUM FENCING w/ SQUARE TOP 1500h

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SCALE	1:200 @ A1	TITLE	LANDSCAPE - DEVELOPMENT FENCING PLAN
DATE	19.03.2019	CLIENT	B. HINDLE
LANDSCAPE ARCHITECT	SIZE A1	DRAWING NO.	I C-04
		REV	C

TPZ – Tree Protection Zone

As per the Australian Standards AS 4970-2009 *Protection of Trees on Development Sites* the tree protection zone (TPZ) is the principal means of protecting the trees on sites where development is to occur. The TPZ is a combination of the root zone and crown area requiring protection. It is isolated from construction disturbance, so that the trees remain viable.

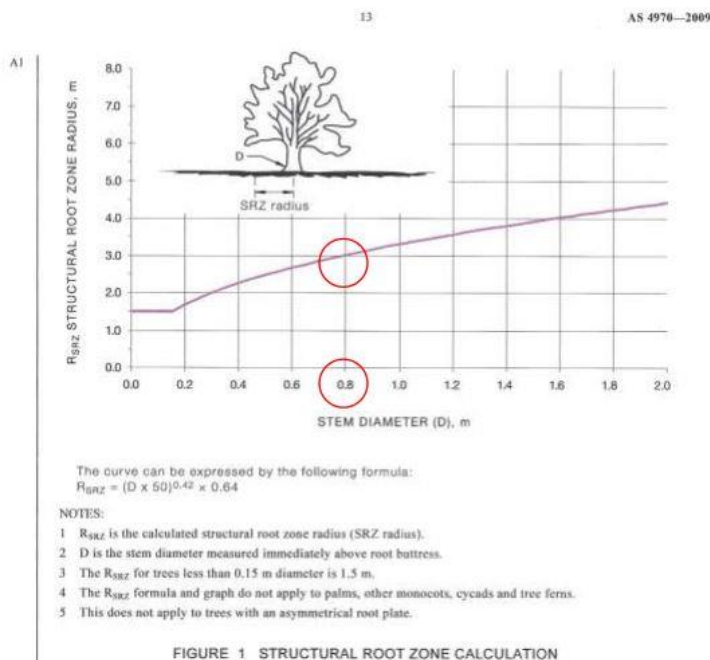
The radius of the TPZ is calculated for each tree by multiplying the (DBH) diameter taken at breast height, DBH x 12. Eg, DBH is 0.5m x 12 = 6m radius (TPZ = 6m measured from centre of the trunk at ground.)

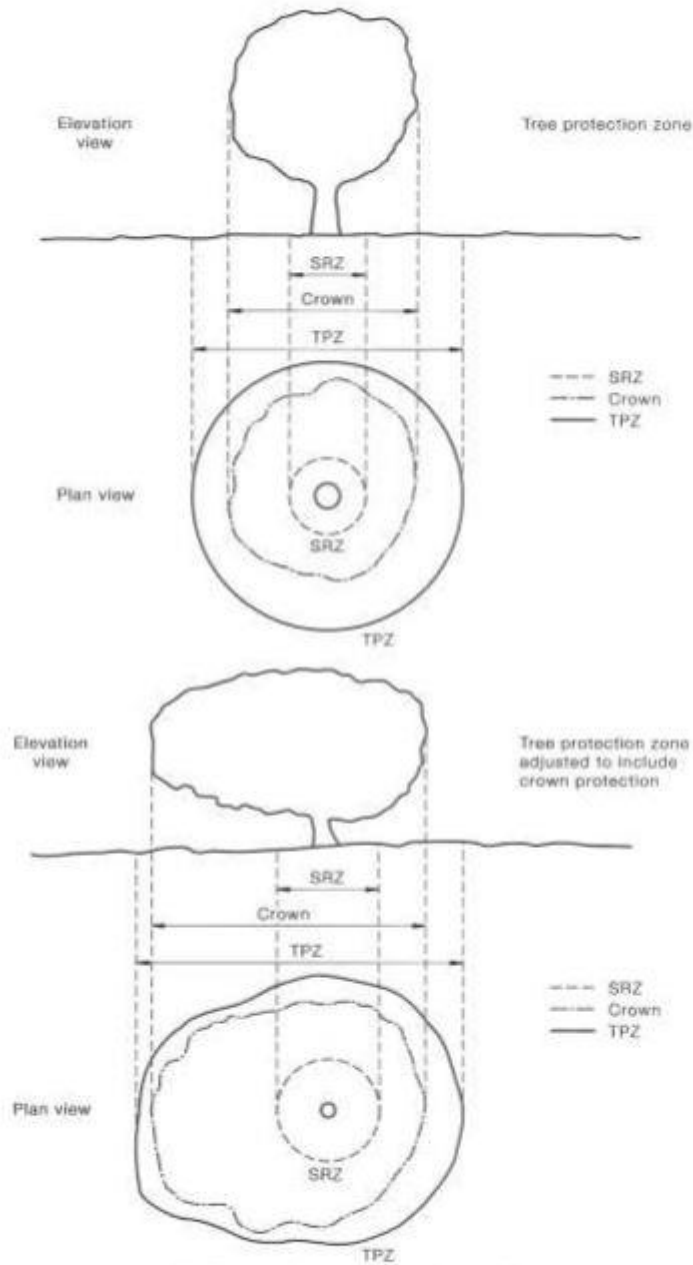
If the proposed encroachment is greater than 10% into the TPZ or SRZ the project landscape architect or suitably qualified arborist must assess the tree to ensure its viability or review the proposed encroachment and suggest alternatives. Refer to the TPZ calculation for AS4970-2009 below fig 02. *An example is shown on the Landscape Tree Removal Plan on the large stands of trees.*

SRZ – Structural Root Zone

This consultant advises that a structural root zone area of a tree is required for tree stability. Using Australian Standards AS 4970-2009 *Protection of Trees on Development sites* the structural root zone area can be calculated when major encroachment into a TPZ is proposed.

If the proposed encroachment is greater than 10% into the TPZ or SRZ the project landscape architect or suitably qualified arborist must assess the tree to ensure its viability or review the proposed encroachment and suggest alternatives. Refer to the SRZ calculation for AS4970-2009 below fig 01.





NOTE: Refer to Clause 3.2 for calculation of TPZ.

FIGURE 2 INDICATIVE TREE PROTECTION ZONE

Summary

This consultant's inspection included approx. 93 trees within the project's site boundaries and verges (Greenvale Place & Harbour Elbow) revealed that they are generally in good/fair condition.

The Tree audit identified out of the 93 specimens;

80 x Trees were native and endemic to the area.

13 x Fruiting trees and exotics, some suitable for transplanting.

51 x Native tree species were marked for retention being in suitable location, condition and species.

32 x approx Native understorey feature transplants were identified for re transplant on the site.

Therefore a total of 74% Native tree species were retained to provide visual amenity, shade and structure to the nature play spaces across the site.

Where trees are being retained it is crucial that designers, contractors and sub-contractors are advised of the potential damage to roots and lower branches from building infrastructure in close proximity to trees. Machinery and vehicles can damage lower canopies, compact and damage tree roots, stock piling of building materials, sand, spoil etc. around trees within TPZ is prohibited. It is recommended that contractors and sub-contractors are notified that works within the TPZ (or canopy drip line) may affect the trees health and if roots over 50mm require pruning they notify a suitable qualified landscape architect or arborist.

It is recommended that all works which are to be carried out within driplines of trees are hand dug using shovels to avoid damage to shallow roots, and common sense relocation of service onsite with appreciation of the trees health taken. All machinery is to be limited inside the TPZ radius and a spotter used if unavoidable.

It is recommended that the following occurs;

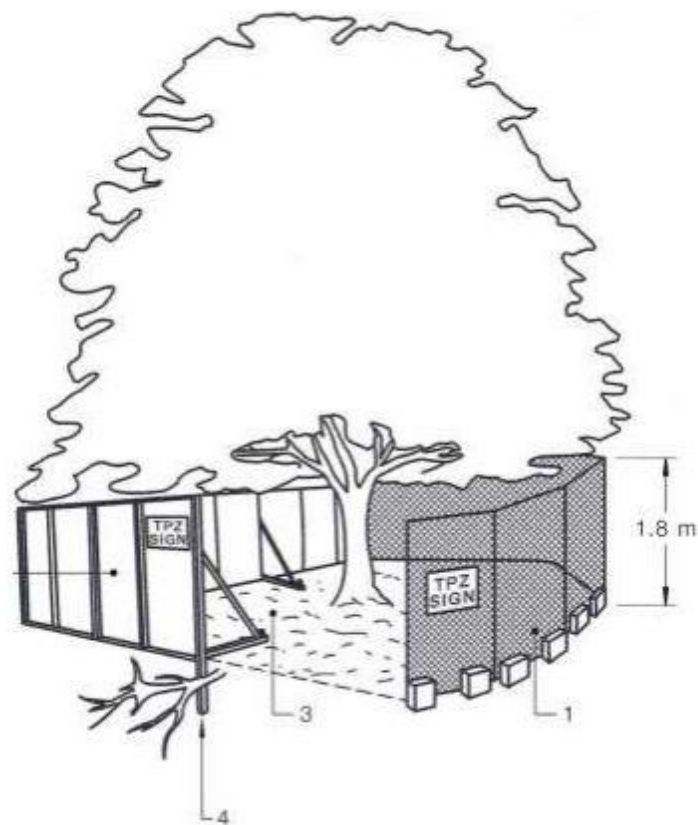
- *Tree Protection Fencing is erected around each tree or groups of trees to prevent damage to canopies and root zones AS 4970-2007. Refer to Fig. 3.*
- *Soil levels around the trees out to the TPZ are not raised or lowered.*
- *Footpaths are installed slightly above natural grade where possible to reduce potential root disturbance.*
- *Irrigation, Power, Water mainlines, Comms are to be hand dug within the TPZ.*
- *Banksia's where practicable to fall into non irrigated areas to avoid future issues associated with this species in reticulated zones.*

Watering trees is required where site works disturbance has occurred in summer to minimise stress to the trees.

The retained trees are recommended to have dead wood and crossing limbs removed and selectively pruned to avoid the level of risk the trees pose to people and property. It is advised that all remedial tree surgery works be carried out by a competent arborist to the relevant Australian Standards – Pruning of amenity trees 4373-2007. The future management, maintenance and condition of the trees have a considerable bearing on their location, safety to persons/users and property being the

main priority. Therefore each tree is recommended for annual inspection to assess the level of risk to the public/users is deemed acceptable.

Example of Tree Protection fencing from AS 4970-2007



LEGEND:

- 1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
- 2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
- 3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
- 4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

FIGURE 3 PROTECTIVE FENCING FROM AS 4970-2009

Contractor Specification for Tree protection during development works

- To reduce the effects that a building development can have upon the health of retained trees, suitable forms of protection are required together with the steps necessary to limit deterioration of those species left standing on the development site.
- This consultant confirms that there is clear evidence that mature trees are more sensitive to contractor pressure than young and semi-mature specimens, where the younger trees are able to compensate and adapt to new ground conditions by producing new roots. However, although younger trees can exhibit a remarkable tolerance to the adverse effects of building operations and site alterations, this is conditional upon the location and extent of works carried out within the root zone of the tree and therefore the extent of primary root removal.
- As with predominantly most trees they store vast amounts of carbohydrate in their root system, subsequently when major roots are severed the tree is unable to replenish its depleted energy levels, which gradually results in the decline of the canopy and often the death of the tree, with such symptoms often not evident until some years later. Therefore there must be clear recommendations to alleviate detrimental tree damage from the commencement through to the completion of the development, with the recommendations enforced and clearly understood by all contractor staff.
- All trees identified for retention shall be clearly marked and a Tree Protection Zone (TPZ) confirmed prior to the commencement of the development. As per Australian Standard AS 4970-2009 Protection of trees on development sites. The tree protection zone is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.
- All heavy machinery shall keep outside the tree protection zone, with any roots damaged or torn roots with a diameter of 30mm or more cleanly severed to initiate occlusion and the contractor is to inform the works supervisor of the damage.
- No root pruning shall be carried out to construct boundary walls or to lay services closer than 1.5m from the base of the tree, with the encroaching roots bridged or under-bored for a distance of 1.5m each side of the trunk, with sufficient distance allowed when bridging for the roots to expand.
- Proposed excavations 1.5m to 2.5m away from the base of the trunk with the exposed roots having a diameter less than 30mm diameter shall be cleanly severed to initiate occlusion.
Roots above 30mm diameter are not to be cut without authorisation from a qualified Arborist.
- No building materials are to be stored or disposed of within the tree protection zone, with provisions implemented so that building chemicals do not come into contact with the root rhizosphere or the roots themselves.
- Excavated soil shall not be stored or built up around the trunk of the tree. **Soil levels will not be changed around the base of trees, either raised or lowered.**
- The laying of surface material (Paving or Asphalt Paths & Roadways) within the root plate spread of the tree shall take into consideration the cultural requirements of the tree,

particularly in relation to moisture and oxygen levels, with the retention of a suitable open surface area.

- Any compaction within the root plate zone of the protected tree to lay paving shall be carried out using a plate compactor only.
- Supplementary watering to all retained trees will be required over summer months where works are occurring and due to the disturbance of soil and opening up of the site. Watering the trees is required to minimise stress on the trees while recommended to water deeply a minimum of once per week for a total of 1000 litres per tree for mature trees and 600 litres for trees less than 8m in height. It is recommended that the water truck or temporary watering system, have a wetting agent in the tank to assist to get the water through to sandy layer to the trees root system.
- Established trees of good vigour and structure represent an asset to any development site. Trees are living organisms that require certain environmental conditions in order to maintain their value as an asset. Damage must be avoided or minimized during the development process and procedures to ensure the protection of trees must be in place at all stages.