Arboricultural Impact Assessment

TREEISM
Arboricultural Services

Prepared For

[redacted]
CPS Dragados Samsung Joint Venture (CDS-JV)
30 Garema Ct
KINGSGROVE NSW 2208

Site Address
Construction Compound C5 (Bexley Road South)
Bexley Surface Works Area (Areas C4, C5 & C6)
Bexley Road, Kingsgrove NSW 2208

Prepared by [redacted]
Consulting Arboriculturist & Horticulturist
Tree Surgery Certificate
Advanced Certificate Urban Horticulture
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Member of the International Society of Arboriculture (ISA)
ISA Tree Risk Assessment Qualification (TRAQ)

Revision 2

[redacted]

April 2018

Contents

1 Introduction

1.1 Brief

This Arboricultural Impact Assessment (AIA) was prepared by Treeism Arboricultural Services and was commissioned by Mr Craig Gibson of CPS Dragados Samsung Joint Venture (CDS-JV).

"The site" is described as Construction Compound C5 (Bexley Road South), part of the Bexley Surface Works Area (Areas C4, C5 & C6). The street location is Bexley Road, Kingsgrove, New South Wales, this is an area of Road and Maritime Service owned land. The overall subject site location is attached as Appendix E - Site Overview Map.

The proposed works are part of the larger WestConnex New M5 project. The scope of work specifically for the discussed area is:

- erection of substation, realignment of footpath and storage area.

This report gives recommendations for tree retention or removal. Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.

This AIA is not intended as an assessment of any impacts on trees by any proposed future development of the site, other than the current discussed scope of work.

The purpose of this report is to assess the vigour and condition of the trees, and identify the potential impacts the proposed development may have on those trees to be retained in proximity to the works.

The author of this report holds an AQF Level 5 Diploma of Horticulture (Arboriculture) and has 24 years in the horticultural industry. 19 of these 24 years have been specifically within the field of arboriculture.

Previous roles varied from working actively as a tree climber in private contracting companies to Tree Management Officer at several local Councils, working with independent Consultants prior to the start up of Treeism. The author is independent from the project.

This AIA has been commissioned to ensure compliance with the requirements set out by the Department of Planning and Environment (DPE) as per Condition B63 - Table 1 (below/next page).

Table 1 –Condition of Approval B63 Compliance Table

Condition	Requirement	Addressed in:
B63	The SSI must be designed to retain as many trees as possible and provide a net increase in the number of replacement trees. The Proponent must commission an independent experienced and suitably qualified arborist, to prepare a comprehensive Tree Report(s) prior to removing any trees on the periphery and/or outside the construction footprint as identified in the figures in Section 6 of the document referred to in condition A2(b), including any tree(s) removed along Euston Road. The Tree Report may be prepared for the entire SSI or separate reports may be prepared for individual areas where trees are required to be removed. The report(s) must identify the impacts of the SSI on trees and vegetation within and adjacent to the construction footprint. The report(s) must include:	This Report and previous report by ATC dated 6 July 2016 –Overview & individual area as per Appendix E & F.

B63(a)	a visual tree assessment with inputs from the design, landscape architect, construction team;	VTA noted in Appendix G. Landscape design was considered for the site in the initial tree assessment report M5N-ES-RPT-PWD-0002. Further to the initial assessment of the landscape Architect, building design levels prevent the retention of these trees. Replacement trees are provided for in the approved Urban Design and Landscape Plan, including replanting in an embankment in the specific location considered in this report.
B63(b)	consideration of all options to amend the SSI where a tree has been identified for removal, including realignment, relocation of services, redesign of or relocation of ancillary components (such as substations, fencing etc.) and reduction of standard offsets to underground services.	Appendix D.
B63(c)	Measures to avoid the removal of trees or minimise damage to existing trees and is to ensure the health and stability of those trees to be protected. This includes details of any proposed canopy or root pruning, excavation works, site controls on waste disposal, vehicular access, and storage of materials and protection of public utilities.	N/A
	In the event that trees are to be removed, then replacement trees are to be planted within, or in close proximity to, the SSI boundary, including along Euston Road where feasible and reasonable The location of the trees must be determined in consultation with the relevant council(s). The replacement trees are to have a minimum pot size of 75 litres. A copy of the report(s) must be submitted to the Secretary for approval prior to the removal, damage and/or pruning of any trees, including those affected by site establishment works. All recommendations of the report must be implemented by the Proponent, unless otherwise agreed by the Secretary.	Consistent with earlier approved Tree Reports replanting will be detailed in the Urban Design & Landscape Plan in consultation with the relevant Council.

1.2 Methodology

In preparation for this report, a review was undertaken of the previous Arboricultural Impact Assessment report authored by Hugh Taylor of Australian Tree Consultants Pty Ltd, titled 'Tree Removals and Plantings: Surface Works (Excluding HV Power Alignment, Cooks River/Castlereagh Ironbark Forest Kingsgrove, Road Widening Works at St Peters)', document number. M5N-ES-RPT-PWD-0002, dated 6 July 2016, Revision 3.

Height, spread, tree stem diameter details as per this previous report of Tree 1 are provided in Appendix G —Schedule of Assessed Trees. Additional notes on Tree 1 and observations on remaining trees are following site inspection undertaken 9th April 2018 by Treeism Arboricultural Services.

No aerial inspections, root mapping or woody tissue testing were undertaken as part of the tree assessment. Information contained in this report only reflects the condition of the tree at the time of inspection by both Australian Tree Consultants Pty Ltd and Treeism Arboricultural Services.

Trees are dynamic, living things which can be subject to change without notice in certain circumstances.

Plans and documents referenced for the preparation of this report include:

- AS4970-2009 Protection of trees on development sites, Standards Australia;
- Conditions B63 –(Table 1);
- Marked up Aerial maps detailing proposed works location. These plans are attached as Appendix E—Site Overview Map & Appendix F- Tree Location Maps;
- Arboricultural Impact Assessment report authored by Hugh Taylor of Australian Tree Consultants Pty Ltd, titled 'Tree Removals and Plantings: Surface Works (Excluding HV Power Alignment, Cooks River/Castlereagh Ironbark Forest Kingsgrove, Road Widening Works at St Peters)', document number.: M5N-ES-RPT-PWD-0002, dated 6 July 2016, Revision 3.

No hydraulic service or landscape plans have been reviewed in preparation of this report.

1.3 Tree Preservation and Management Guidelines

The proposed works form part of the approved WestConnex New M5 State Significant Infrastructure project (SSI 6788), which overrides the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 'Vegetation SEPP' (which refers to prescribed and non-prescribed trees pursuant to the Rockdale Development Control Plan 2011 (RDCP) Part 4.1.7).

What constitutes a 'tree' as per planning approval is any tree that:

- is equal to or greater than three (3) metres in height; or
- for a single trunk species, a trunk circumference of 300 millimetres at a height of one metre above ground level; or
- for a multi-trunk species, a trunk circumference exceeding 100 millimetres at a height of one metre above ground level.

However this excludes any species listed under the Noxious Weeds Act 1993.

2 Observations and Discussion

2.1 Summary of Assessed Trees

Four (4) trees/tree groups are the subject of this report. Details of these trees are included in the Schedule of Assessed Trees – Appendix G.

2.2 Threatened Species

None of the assessed trees are subject to threatened conservation status under Australian and/or State Government legislation (i.e. NSW Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

2.3 Proposed Removal of Prescribed Trees

Three (3) prescribed trees will require removal due to the requirement to alter the current ground surface level at this site for construction (to pile the basement of the substation), and to rebuild the pedestrian pathway on a different alignment.

The required final embankment level will be at a substantially higher grade then that of the current tree location. Significant increases in soil levels within the defined notional Tree Protection Zones (TPZ) of trees creates an anaerobic environment, eventally leading to root death and tree instability.

There is no option to alter the discussed above plans as a 132 Kv Transgrid cable (which supplies Beaconsfield and ultimately the Central Buisness District -CBD) is immediately east of the subject tree, within the site boundary.

The placement of the substation and the design of the pedestrian path are all based on not altering levels on this 132 Kv Transgrid cable as doing such can, I have been informed, create heat loading and can cause power failure (CBD power outage).

At the time of preparation of the *Tree Removals and Plantings Report* (Revision 3), the construction methodology of the substation and realignment of the path was not finalised, hence the subject trees was proposed to be retained. Now that design has progressed and construction methodology confirmed, it has been determined the subject trees can no longer be retained.

All subject trees have been determined a *Low* Retention Value (RV- see Appendix C), these species of trees are known to be short lived and Trees 3 and 4 *Acacia saligna* (Golden Wreath Wattles), are a known weed in south-eastern Australia. In my opinion, removal and replacement elsewhere would not significantly affect the local environment.

3 Recommendations

3.1 Tree Removal

Three (3) prescribed trees (Tree 1, 3 & 4) are required to be removed to accommodate the proposed works. Replanting will be undertaken in accordance with the condition B63 of the Compliance Table.

It is assumed non-prescribed trees (Group 2) will be removed to accommodate the proposed works.

4 References

Credit to Catriona Mackenzie of ‘Urban Forestry Australia’ for general report layout and several areas of text.

Mattheck, C. & Breloer, H. (1994) The Body Language of Trees: A handbook for failure analysis. Research for Amenity Trees No. 4, The Stationery Office, London.

Standards Australia AS4373-2007: Pruning of Amenity Trees, Standards Australia, Sydney.

Hadlington, P. & Johnston, J. (1988) Australian Trees: Their Care & Repair. University of NSW Press, Kensington.

Standards Australia AS4970-2009 Protection of trees on development sites, Standards Australia, Sydney.

Barrell, J (1995) Pre-development Tree Assessment from Trees and Building Sites, Eds. Watson & Neely, International Society of Arboriculture, Illinois.

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5 Appendices

5.1 Appendix A - Terms and Definitions

Aerial inspection: where the subject tree is climbed by a professional tree worker/ arborist (typically AQF Level 3) specifically to inspect and assess the tree for signs of symptoms of defects, disease, etc.

Age classes

Y Young refers to an established but juvenile tree.
SM Semi-mature refers to a tree at growth stages between immaturity and full size.
EM Early-mature refers to a tree close to full sized still actively growing.
M Mature refers to a full sized tree with some capacity for further growth.
LM Late-Mature refers to a full sized tree with little capacity for growth that is not yet about to enter decline.
OM Over-Mature refers to a full sized tree with little capacity for growth that is entering or has entered decline.

Co-dominant: refers to stems or branches equal in size and relative importance.

Condition/Structure: refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition/structure.

Deadwood: refers to any whole limb that no longer contains living tissues (e.g. live leaves and/or bark). Some dead wood is common in a number of tree species.

Diameter at Breast Height (DBH): Refers to the tree trunk diameter at breast height (1.4 metres above ground level).

Epicormic growth: adventitious branches that are considered to be a weak attachment in the short term due to minimal wood formation. There are generally formed following storm-related branch breakage or poor pruning practices. Should sufficient holding wood form in the long-term this growth is less of an issue.

Hazard: refers to anything with the potential to harm health, life or property.

Health: Refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

Inclusion stem/bark: the pattern of development at branch or stem junctions where bark is turned inward rather than pushed out. This fault is located at the point where the stems/branches meet. This is normally a genetic fault and potentially a weak point of attachment as the bark obstructs healthy tissue from joining together to strengthen the joint.

Scaffold branch/root: a primary structural branch of the crown or primary structural root of the tree.

Secondary Stem: refers to stems or branches with one of unequal size and relative importance.

SRZ: refers to the Structural Root Zone of the tree, this is the area required for tree stability.

TPZ: refers to the Tree Protection Zone of the tree, this is the primary method of protecting trees, it is a combination of the root area and the canopy and the SRZ is located within it.

Visual Tree Assessment (VTA): a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

5.2 Appendix B - ULE Guide

ULE categories (after Barrell 1996, Updated 01/04/01)

The five categories and their sub-groups are as follows:

1. Long ULE - tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:

    a) Structurally sound trees located in positions that can accommodate future growth
    b) Trees which could be made suitable for long term retention by remedial care
    c) Trees of special significance which would warrant extraordinary efforts to secure their long term retention

2. Medium ULE - tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:

    a) Trees which may only live from 15 to 40 years
    b) Trees which may live for more than 40 years but would be removed for safety or nuisance reasons
    c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    d) Trees which could be made suitable for retention in the medium term by remedial care

3. Short ULE - tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:

    a) Trees which may only live from 5 to 15 years
    b) Trees which may live for more than 15 years but would be removed for safety or nuisance reasons
    c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    d) Trees which require substantial remediation and are only suitable for retention in the short term.

4. Removal - trees which should be removed within the next 5 years:

    a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions
    b) dangerous trees through instability or recent loss of adjacent trees
    c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form
    d) Damaged trees that are clearly not safe to retain
    e) Trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    f) Trees which are damaging or may cause damage to existing structures within the next 5 years
    g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f)
    h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review

5. Small, young or regularly pruned - Trees that can be reliably moved or replaced:

    a) small trees less than 5m in height
    b) young trees less than 15 years old but over 5m in height
    c) formal hedges and trees intended for regular pruning to artificially control growth

5.3 Appendix C - STARS - Significance of a Tree Assessment Rating System (IACA 2010)©
(1 of 2)

The landscape significance of a tree is an essential criterion for establishing the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree.
This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance and *Useful Life Expectancy* of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape.

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape.

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area;
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street;
- The tree provides a fair contribution to the visual character and amenity of the local area;
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape.

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings;
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area;
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen;
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions;
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms;
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species:
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties;
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline:
- The tree is structurally unsound and/or unstable and is considered potentially dangerous;
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

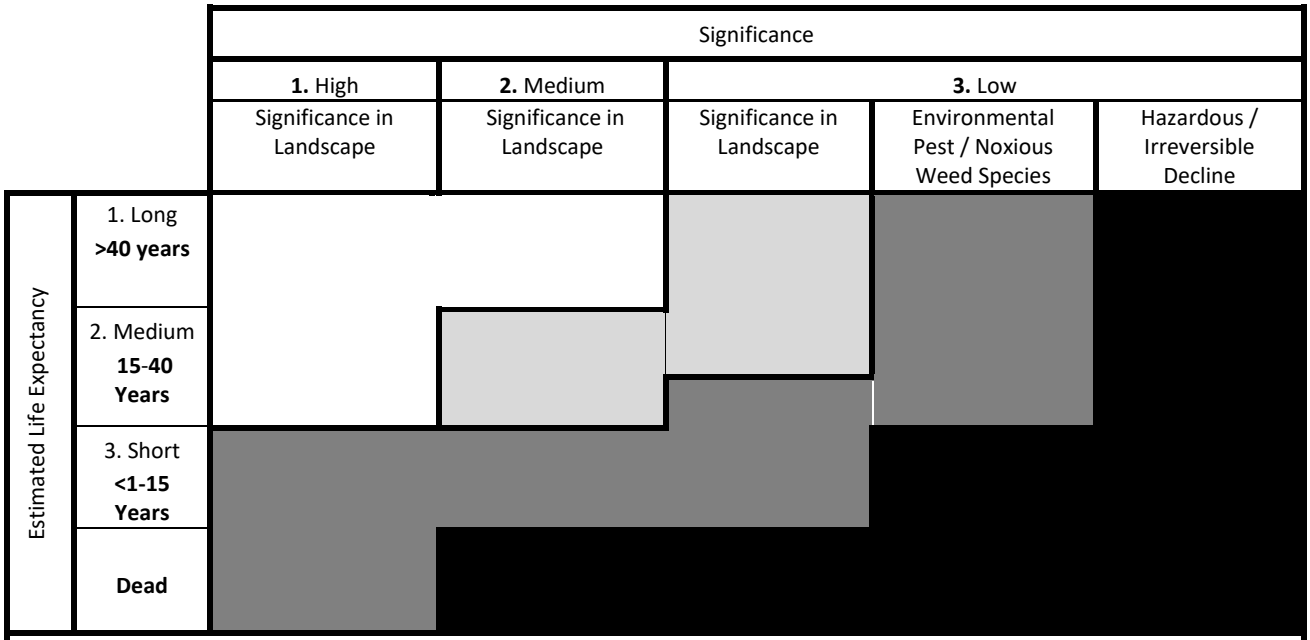
5.4 Appendix C - STARS - Significance of a Tree Assessment Rating System (IACA 2010)©

(2 of 2)

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are designed for individual trees only, but can be applied to a monocultural stand in its entirety e.g. hedge.

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd and Andrew Morton in June 2001.



Legend for Matrix Assessment

	Priority for Retention (High) -These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.
	Consider for Retention (Medium) -These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for Removal (Low) -These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal -These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

Table 1 - Tree Retention Value - Priority Matrix.

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

5.5 Appendix D - Record of Meetings

While no specific meeting minutes were taken, Craig Gibson provided the following details on the 26th March 2018 -

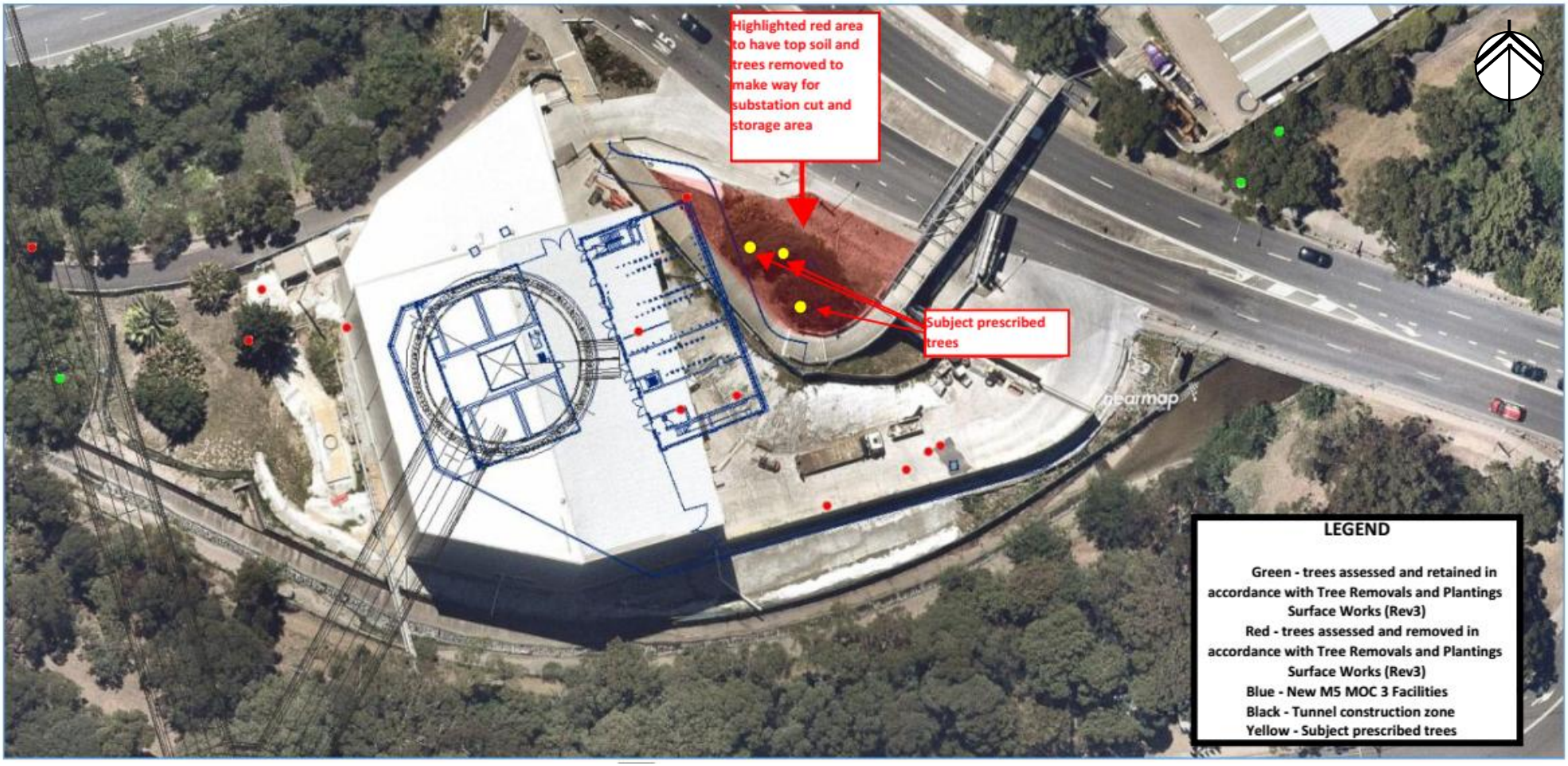
'I have had a site meeting on 7/3/2018 with John McSweeney (Project Engineer, Buildings, CDS-JV) and Lyndon Clements (General Foreman, Buildings, CDS-JV).

No minutes were taken, but we looked at various options to keep the tree, but it all comes back to the fact that we need to change the surface level at this site for construction (to pile the basement of the substation), to rebuild the pedestrian path on a different alignment, and the final embankment is at a different grade and height at the location of this tree too (it would be buried).

There is no option to rearrange this as a 132 KV Transgrid cable (which supplies Beaconsfield and ultimately the CBD) is immediately east of the tree in question, within our site boundary. The placement of the substation, pedestrian path are all based on not altering levels on the cable (which creates heat loading) and can cause failure (CBD power outage)'.

5.6 Appendix E - Site Overview Map

5.7 Appendix F - Tree Location Map



5.8 Appendix G - Schedule of Assessed Trees – Bexley Surface Works Area Site Inspection 9/4/2018.

Site Inspection 3rd & 25th May 2016 by Australian Tree Consultants (ATC) Pty Ltd in relation to Tree 1. Height, spread and diameter as per Part 4 of this report, document number; M5N-ES-RPT-PWD-0002.

Tree No.	*Genus & species* **Common Name**	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
1	*Acacia parramattensis* **Parramatta Wattle**	13	8	250	EM	F	F	Locally native species. Known short lived species. Significant borer damage noted with excessive frass and canopy decline.	3D	M	L	1.85	3.0	28
G2	*Livistonia australis* **Cabbage Tree Palm X 20**	.5-3	2-4	75-150	Y-EM	G	G-F	Locally native species. Young plantings, some leaf burn noted. Height measurement taken of true stem only.	5A	M	L	-	-	-
3	*Acacia saligna* **Golden Wreath Wattle**	7.5	7	@1.8 AGL 275	M	G	F	Introduced native species. Secondary stem at ground level – this has broken off and has been removed. Growth splits noted on stem. Known short lived species.	3A	M	L	2.0	3.3	35
4	*Acacia saligna* **Golden Wreath Wattle**	5	9	@ 1m AGL 175	M	G	G	Introduced native species. Twisted form. No special problems noted at time of assessment. Known short lived species.	3A	M	L	1.6	2.2	15

KEY

Tree to be retained.

Not classed as 'a tree' under DPE conditions i.e. non-prescribed (see Part 1.3).

Tree proposed to be removed.

L	Low Retention Value-These trees are not considered important for retention.	M	Medium Retention Value-These trees may be retained & protected.	H	High Retention Value -These trees are considered important for retention and should be retained and protected.

H refers to the approximate height of a tree in metres, from base of stem to top of tree crown.

Sp refers to the approximate and average spread in metres of branches/canopy (the 'crown') of a tree.

DBH refers to the approximate diameter of tree stem at breast height i.e. 1.4 metres above ground (unless otherwise noted), and expressed in millimetres.

Age refer to Appendix A -Terms and Definitions for more detail.

V refers to the tree's vigour (health) Refer to Appendix A -Terms and Definitions for more detail.

C refers to the tree's structural condition. Refer to Appendix A -Terms and Definitions for more detail.

ULE refers to the estimated *Useful Life Expectancy* of a tree. Refer to Appendices A and B for details.

TSR The *Tree Significance Rating* considers the importance of the tree as a result of its prominence in the landscape and its amenity value, from the point of view of public benefit. Refer to Appendix C – Significance of a Tree Assessment Rating for more detail.

RV Refers to the retention value of a tree, based on the tree's ULE *and* Tree Significance. Refer to Appendix C – Significance of a Tree Assessment Rating for more detail.

SRZ Structural Root Zone (SRZ) refers to the critical area required to maintain stability of the tree. Refer to Appendix A -Terms and Definitions for more detail.

TPZ Tree Protection Zone (TPZ) refers to the *tree protection zones* for trees to be retained. Refer to Appendix A -Terms and Definitions for more detail.

5.9 Appendix H – Photographs

Plate 1 – Tree 1 noted with red arrow.

Plate 2 – Tree 1 with excessive frass at branch junctions and base of stem.

Plate 3 – Tree 3 secondary stem broken at 1.8m above ground level – suspect storm damage noted with red arrow.

Plate 4 – Overview of site and Tree numbering as per Appendix G - Schedule of Trees.