

Mr Frank Katsanevas
Group Design Manager
St Hilliers Property
3/8 Windmill Street
Millers Point NSW 2000

28 August 2019

Dear Mr Katsanevas

Arboricultural Impact Assessment
26 Mann Street, Gosford.



TREE MANAGEMENT
CONSULTING ARBORICULTURISTS
HORTICULTURISTS
LANDSCAPE DESIGNERS
ABN 48 623 390 572

I write regarding the current Development Proposal ('the proposal') for 26 Mann Street, Gosford ('the site').

I have been engaged by SH Gosford Residential Pty Ltd to provide urgent advice regarding the likely impact of the proposal on the health, structural condition and viable retention of a large, mature fig tree near the southeast corner of the site.

I have also been asked to specifically note and address the SEARS requirement to "*Ensure the existing Ficus on the corner of Vaughan Avenue and Mann Street is preserved.*"

On 21 and 27 August 2019, Urban Forestry Australia attended the site and undertook assessments of the tree and its current surroundings. The details of the tree are as follows:

Table 1: Tree details

Genus & species Common Name	Ht (m)	Sp (m)	DBH (cm)	Age	V	C	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (m²)
<i>Ficus macrophylla</i> Moreton Bay Fig	22 - 23	11 N, 13 S 15 E, 11 W	235	M	G	F - G	1A	H	H	4.7	15	707

* See attachments for explanation of column headings.

I also noted a mature eucalypt (possibly *Eucalyptus pilularis* [Blackbutt]) growing at the base north side of the subject fig, and a *Ficus microcarpa* "Hillii" (Hills Weeping Fig), probably self-sown from seed from the Hills Weeping Figs on the land to the south. The Hills Weeping Fig is growing up the south side of the subject fig.

Following my assessment, discussion in regard to minimising encroachments into the tree's Designated Tree Protection Zone root zone were held. Design changes were made until a proposal that I can support from an arboricultural perspective was put forward for review.

I have reviewed the site survey dated 5 July 2019 by Veris, and EW Tree Impact Sections dated 26 August 2019, by DKO Architecture. These sections are attached to this report at page 11 (last page).

As this tree has an already substantial percentage of its 15m radius 'notional' TPZ covered by road surface, as well as several services running through the TPZ, it must have compensatory ground contiguous with the root zone to maintain tree health. This compensatory area is in line with recommendations at 3.3.3 of the Australian Standard 4970-2009 *Protection of trees on development sites*.

The area identified as required for the protection and on-going viability of the tree is known as the Designated Tree Protection Zone and differs from the notional Tree Protection Zone (Figure 1).

In addition, works cannot include bulk excavation within or at the edge of the tree's Structural Root Zone due to the likelihood structural support roots are encountered and severed, potentially affecting the tree's anchorage in the ground (Figure 1).

PROPOSED DEVELOPMENT WEST SIDE OF TREE

Approximately 4m west of the fig is an existing crib wall, behind which fig roots are clearly visible. West of this wall is a large rectangular depression/excavation which appears to be around 8m long x 4m wide and around 1.5m deep. There are some torn fig roots at the soil surface, just beyond the crib wall (Plate 1).

The proposal indicates basement excavation beyond the crib wall and, given the existing depression or excavation, it is my opinion the proposed offset to the basement excavation of approximately 7m is acceptable and is unlikely to affect tree health or stability (Figure 1).

The manner in which the proposed excavation is managed to prevent further encroachment is crucial to maintaining the tree. Shoring of the sandy soil must be in place to prevent further soil collapse, and over excavation must be limited to remain clear of the crib wall. As there are fig roots entwined into and around it, this crib wall must be retained adjacent to the tree to prevent further root damage and loss, and an engineer may be required to provide advice in regard to stabilising this wall.

No pruning of the tree is anticipated on its west side of crown.

PROPOSED DEVELOPMENT EAST SIDE OF TREE

A proposed elevated driveway 'bridge' can be adopted that does not disturb the underlying natural ground except for a small area at street level where minor excavation will occur for the driveway to meet existing road levels.

PROPOSED DEVELOPMENT NORTHWEST SIDE OF TREE

Subsequent to advice, the uppermost proposed basement floor within the DTPZ is to be deleted. The lower two basement floors will be undercut to limit disturbance to the existing soil within the tree's DTPZ.

The methodology includes driving horizontal members into the soil and shoring and/or stabilising the area prior to removal of the soil. The upper surface remains undisturbed. As long as 1200 – 1500mm of the existing soil depth can be retained in the DTPZ the tree is unlikely to experience any adverse disturbance or damage to its root system.

The fig will require some pruning to the north to accommodate building clearance and podium level construction scaffolding. The extent of this pruning would include at least one lower limb of 225 – 250mm diameter over the driveway, and at least 2 or 3 limbs of 100 – 150mm diameters for the building line. This pruning represents less than 5% of the tree's live crown volume. As the tree is vigorous, I would expect it to tolerate this minor pruning without any perceivable effect on its long-term health or viability.

SUMMARY

In summary, it is my opinion the current proposal will not have an adverse impact on retention of the tree as long as the proposed basement carparking adopts an undercut design that allows for retention of at least 1200 – 1500mm depth of the existing soil profile in the DPTZ.

PRELIMINARY RECOMMENDATIONS

- Design changes within or close to the tree's notional of designated Tree Protection Zone shall be reviewed by a competent arboriculturist with a minimum AQF5 in arboriculture.
 - The existing crib wall is to remain in place within the notional Tree Protection Zone offset (i.e. within a 15m radius of the tree).
 - No fill or introduced soil media greater than 150mm depth shall be introduced between the existing crib wall and the tree, including the Designated Tree Protection Zone (i.e. the tree protection area identified in Figure 1).
 - Any additional soil media (e.g. for landscaping purposes) shall be of a coarse texture to avoid development of perched water areas within the DTPZ and shall not be used within the tree's Structural Root Zone radius.
 - Pruning of the tree must only be undertaken by qualified tree workers with a minimum AQF 3 in arboriculturist.
- All pruning must be undertaken to Australian Standard 4373-2007 Pruning of amenity trees.

Yours faithfully,



Catriona Mackenzie

Consulting arboriculturist, horticulturist and landscape designer.

Tree Risk Assessment Qualified 2014 (TRAQ)

Certificate of Horticulture *Honours*

Diploma of Horticulture (Arboriculture) *Distinction*

Associate Diploma of Applied Science (Landscape) *Distinction*

Member of the International Society of Arboriculture (ISA)

Founding Member of the Institute of Australian Consulting Arboriculturists (IACA) ACM0052003





Plate 1—Illustrates the location of an existing excavation approximately 8m x 4m x 1.5m, and approximately 5m west of the subject fig. Note severed/torn roots at right (arrowed)

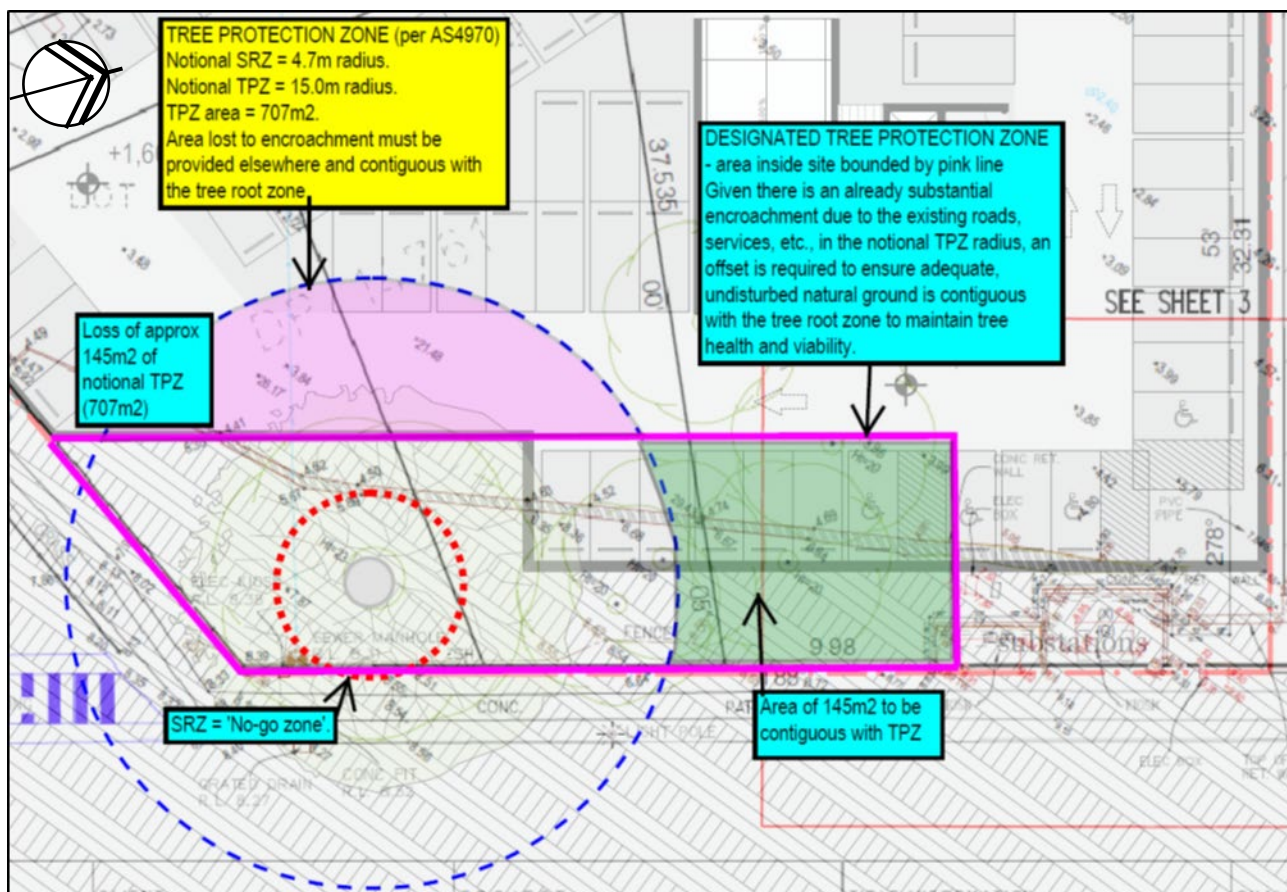


Figure 1—Illustrates the Structural Root Zone (inner, red dotted circle) and notional Tree Protection Zone (outer, blue dotted circle) offsets for the subject fig tree. Proposed encroachment to west (pink, shaded area) and compensatory area (green shaded area) required to offsets loss of Tree Protection Zone.

Excerpt of P4 ground floor plan with excerpt of survey plan overlaid, marked up by C. Mackenzie. Not to scale.

DETAILS OF HEADINGS/SYMBOLS USED IN TREE TABLE

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/or average diameter spread in metres of branches/canopy (the 'crown') of a tree N/S = North to South spread, E/W = East to West spread.
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 centimetres.
Age	
Y	<i>Young</i> refers to a well-established but juvenile tree.
SM	<i>Semi-mature</i> refers to a tree at growth stages between immaturity and full size.
EM	<i>Early-mature</i> refers to a tree that is more or less full sized and vigorously growing.
M	<i>Mature</i> refers to a full sized tree with some capacity for further growth.
LM	<i>Late Mature</i> refers to a full sized tree with little capacity for growth that is not yet about to enter decline.
OM	<i>Over-mature</i> refers to a tree about to enter decline or already declining.
LS	<i>Live Stag</i> refers to a tree in a significant state of decline. This is the last life stage of a tree prior to death.
V	refers to the tree's vigour (health).
C	refers to the tree's structural condition.
ULE	refers to the estimated <i>Useful Life Expectancy</i> of a tree.
TSR	The <i>Tree Significance Rating</i> considers the importance of the tree as a result of its prominence in the landscape and its amenity value, from the point of public benefit.
RV	Refers to the retention value of a tree, based on the tree's ULE and tree's TSR.
SRZ	Structural Root Zone (SRZ) refers to the critical area required to maintain stability of the tree.
TPZ	Tree Protection Zone (TPZ) refers to the <i>tree protection zones</i> for trees to be retained.
TPZ area	the calculated area within the TPZ radius.

TREE RETENTION VALUE ASSESSMENT

Part 1 of 3—Useful Life Expectancy (ULE)

In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. ULE i.e. a system designed to classify trees into a number of categories so that information regarding tree retention can be concisely communicated in a non-technical manner. ULE categories are easily verifiable by experienced personnel without great disparity.

A tree's ULE category is the life expectancy of the tree modified first by its age, health, condition, safety and location (to give the life expectancy); then by economics (i.e. cost of maintenance - retaining trees at an excessive management cost is not normally acceptable); and finally, effects on better trees, and sustained amenity (i.e. establishing a range of age classes in a local population). ULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with a short ULE may at present be making a contribution to the landscape, but their value to the local amenity will decrease rapidly towards the end of this period, prior to them being removed for safety or aesthetic reasons.

ULE categories (modified from Barrell 2001) 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

Part 2 of 3—IACA Significance of a Tree, Assessment Rating System (STARS)©

The landscape significance of a tree is an essential criterion to establish 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. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance 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 <i>in situ</i> - 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 a form typical or atypical for the species
The tree is a planted locally indigenous or a common species with its taxa commonly planted in the 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 and/or below ground influences, reducing its ability to reach dimensions typical for the taxa <i>in situ</i> .
3. LOW SIGNIFICANCE IN LANDSCAPE
The tree is in fair-poor condition and good or low vigour
The tree has a form atypical for 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 <i>in situ</i> - 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

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

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

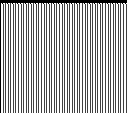
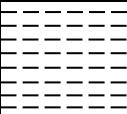
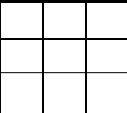
In the development of this document IACA acknowledges the contribution and original concept of the Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd and Andrew Morton in June 2001.

Part 3 of 3—Tree Retention Value Priority Matrix

		SIGNIFICANCE																
		1. High				2. Medium				3. Low								
		Significance in landscape				Significance in landscape				Significance in landscape				Environmental pest / Noxious weed species		Hazardous / Irreversible decline		
ESTIMATED LIFE EXPECTANCY	1. Long >40 years																	
	2. Medium 15–40 years																	
	3. Short <1–15 years																	
	Dead																	

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 AS4970 <i>Protection of trees on development sites</i> . 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.
	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.

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

REFERENCES

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

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Academic Qualifications:

2014 ISA Tree Risk Assessment Qualification (TRAQ)

2003 – 2004 Diploma of Horticulture (Arboriculture) AQF5 Ryde TAFE. *Distinction*

1998 – 2000 Associate Diploma of Applied Science (Landscape Design) at Ryde TAFE. *Distinction*

1983 – 1985 Certificate of Horticulture, Ryde School of Horticulture, Ryde TAFE. *Honours*

Current Professional Memberships:

Member of the Australian Institute of Horticulture

Member of the International Society of Arboriculture

Founding (2003), Accredited Member & past President (2013–2016) of the Institute of Australian Consulting Arboriculturists.

Introduction:

Catriona Mackenzie has been involved in the horticultural, landscape design and arboricultural industry since 1981. Catriona has always maintained a 'hands-on' approach to her landscape and arboricultural projects from the initial stages of design through to managing the landscape and the protection of significant trees and vegetation. Her experience with managing long term landscapes comes from her own landscape design and management business, which she operated for 10 years from 1989 to 2000. Her experience in the arboricultural field encompasses a wide range of tree related work including employment in Local Government (i.e. former Warringah, and Pittwater Councils) and established arboricultural contracting/consulting firms, and as principal consultant for an established arboricultural consulting business (Urban Forestry Australia).

Ms. Mackenzie has also worked as a part time teacher at Ryde TAFE, teaching arboricultural and landscape subjects, i.e. Laws and Regulations, Site Grading, Landscape Graphics, and some relief teaching in Protection of Trees on Construction Sites.

Ms. Mackenzie routinely attends the Arboriculture conferences held in Australia each year and attends the TREENET symposiums held in Adelaide each September. She has attended various seminars and workshops over the past years relating to the arboricultural and landscape professions. Ms. Mackenzie continues to contribute time and effort to the profession and practice of arboriculture and landscape design and is a former President of the Institute of Australian Consulting Arboriculturists.

Professional Experience 1981 – 2019

Works include:

Arboricultural, horticultural and landscape heritage assessments.

Landscape plans, specifications and documentation for development applications.

Landscape amenity assessments and sustainability plans.

Development Assessments.

Protection and preservation of trees on construction sites.

Risk and Hazard Assessments.

Tree Valuations.

Plans of Management for city parks.

Consultancy to private, commercial, religious and educational organizations, state and local government bodies.

Tree auditing, and tree management programs.

Expert Witness

Class 1 Proceedings

Class 2 Proceedings

Class 3 Proceedings

Class 4 Proceedings

District Court

Local Court

Supreme Court

New South Wales Coroner's Court

