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ARBORICULTURAL ASSESSMENT REPORT

At

WESTFIELD WARRINGAH STORMWATER & SEWER RE-ALIGNMENT
Near Condamine Street

Prepared for

Scentre Group

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DISCLAIMER

The Client acknowledges that this Report, and any opinions, advice or recommendations expressed or given in it, are the information supplied by the Client and on the data inspections, measurements and analysis carried out or obtained by Jacksons Nature Works (JNW) and referred to in the Report. The Client should rely on The Report, and on its contents, only to that extent.

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However Ross Jackson – Consulting Arborist can neither guarantee nor be responsible for the accuracy of information provided by others. Unless stated otherwise:

- Information contained in this report covers only the trees examined and reflects the health and structure of the trees at the time of inspection. The documented, observations, results, recommendations and conclusions given may vary after the site visit due to environmental conditions.
- The inspection was limited to visual examination from the base of the subject tree without dissection, excavation, probing or coring; and
- There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

Ross Jackson.

Consulting Arborist

30th September 2015

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1. BACKGROUND and METHODODOLGY

1.1 The purpose of this Tree Report is to inform and accompany a Section 96 Application to remove trees in relation to stormwater works along Condamine Street towards Pittwater Road, Brookvale – The Site.

1.2 The report was commissioned by Mr W Thomas, Project Design Manager, SCENTRE Group to consider the development impacts on trees on Site along Condamine Street, Brookvale.

1.3 The trees were examined by ground level Visual Tree Assessment (VTA) [1] only in the data collection, taken on 29th September 2015. No aerial (climbing) was undertaken.

1.4 All site photographs were taken by the author at the site. All photographs were taken using a digital camera (Canon 600D) with no image enhancement either within the camera or on computer.

1.5 The subject trees were located on plans supplied. The trees have been plotted and can be found on Annexure B – Tree Location Plan.

1.6 To prepare this report we have reviewed the following documents:

- Tree Report by Tree Scan Urban Forest Management (TRUFM), dated November 2008;
- Development Application No. DA 2008/1742, by Warringah Council; &
- Warringah Council Tree Preservation Order (TPO); &
- Australian Standard AS 4970 – 2009 Protection of trees on development sites.

2. OBSERVATIONS as seen on the days of inspection (29.09.2015)

2.1 The trees examined correspond to the numbers used in the report by TRUFM for trees 15 – 47, then a new numbering system has been employed - Annexure A.

2.2 An aluminium tag has been attached to each tree assessed as part of this report.

3. DISCUSSIONS

3.1 Approval has been granted by Warringah Council to undertake Stormwater and Sewer works from Cross Street, along Pittwater Road then across Condamine Street to the Golf Course in DA 2008/1742, dated 16.5.2012.

3.2 The sewer re-alignment works has been triggered by the proposed lowering of the existing culvert at C6, including a larger culvert chamber – see Annexure C.

The existing sewer line can be seen in Annexure C as the light blue line. The re-aligned sewer is the darker blue line. The new sewer pipe is 1200mm with an easement of 5.5m.

[1] Mattheck, Dr. Clause & Breloer, Helge (1994) – Sixth Edition (2001) **The Body Language of Trees – A Handbook for Failure Analysis** The Stationery Office, London, England

The installation of the re-aligned sewer line requires a working area in excess of the easement width of over seven (7) metres.

An examination of the trees along the re-aligned sewer line has found the following trees will require removal:

1. Trees 15, 18, 19 & 20 *Casuarina cunninghamiana*;
2. Trees 21, 24, 30, 39, 42, 46, 47, 48, 49, *Eucalyptus robusta;*
3. Trees 22, 23, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 45, 53, 54, 55, 56, 57 & 58 *Melaleuca quinquenervia;*
4. Trees 43 & 44 *Corymbia maculata;* &
5. Trees 51 & 52 *Melaleuca armillaris.*

The following trees are outside the proposed works and can be retained and protected as part of the site works:

1. Trees 58A, 59, 60, 60A, 61, 62, 63, 64, 66 & 68 *Cupaniopsis anacardioides;* &
2. Tree 67 *Melaleuca quinquenervia;*

3.3 Approval has been granted by Warringah Council to undertake Stormwater works from Cross Street, along Pittwater Road then across Condamine Street to the Golf Course in DA 2008/1742, dated 16.5.2012.

4. RECOMMENDATIONS

In consideration of the data collected recommendations are provided for the removal or retention of trees including specific tree protection measures required to reduce the anticipated impacts from the proposed construction on those trees proposed to be retained.

The report specifically recommends:

1. The removal of the following trees as part of the sewer re-alignment along the Condamine Street side of the Site: Trees 15, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57 & 58;
2. The following trees can be retained: Trees 58A, 59, 60, 60A, 61, 62, 63, 64, 66, 67 & 68;
3. Approval to remove these trees shall be obtained from Warringah Council as these trees are covered by their Tree Preservation Orders;
4. Tree removal work shall be carried out by an experienced tree surgeon in accordance with NSW WorkCover Code of Practice for Amenity Tree Industry (1998);
5. That the area be replanted as designed by DEM Landscape Architects;
6. Install the following Tree Protection Measures around the retained trees: Tree protection measures shall be a temporary fence of chain wire panels 1.8 metres in height (or equivalent), supported by steel stakes or concrete blocks as required and fastened together and supported to prevent sideways movement. Existing boundary fences or walls are to be retained shall constitute part of the tree protection fence where appropriate. A sign is to be erected on the tree protection fences of the trees to

be retained that the trees are covered by Council's tree preservation orders and that "No Access" is permitted into the tree protection zone;
7. An AQF Level 5 Project Arborist shall be engaged to supervise the building works and certify compliance with all Tree Protection Measures; &
8. Our tree location plans can be found on Annexure B & C.

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Annexure A: Observations as seen on the day of inspection of trees

Tree No	Botanical Name	Age Class	Height – m	Spread - m	D.B.H	D.B.R	TPZ & SRZ Rad.m	Condition comments on trees as seen on site	ULE
15	*Casuarina (C.) cunninghamiana*	M	16	10	470	600	5.6, 2.7	G – failed bifurcated stem at 5m	3
16	*Removed*								
17	*Removed*								
18	*C. cunninghamiana*	M	8	3	220	170	2.6, 1.5	Declining with lost apical growth	4C
19	*C. cunninghamiana*	M	12	5	360	430	4.3, 2.3	G	2
20	*C. cunninghamiana*	M	8	2	200	250	2.4, 1.8	A – pole like	3
21	*Eucalyptus (E.) robusta*	M	16	10	560	720	6.7, 2.9	G. Bifurcated at 2m. Basal injury	2D
22	*Melaleuca (M.) quinquenervia*	M	13	8	350	460	4.2, 2.4	F – suppressed form	2D
23	*M. quinquenervia*	M	8	3	170, 150 (230)	260	2.7, 1.9	F – suppressed form	3C
24	*E. robusta*	M	16	9	500	690	6.0, 2.7	G	3
25	*M. quinquenervia*	M	13	7	440, 150 (470)	500	5.6, 2.5	F – suppressed form	3
26	*M. quinquenervia*	M	11	9	370	500	4.4, 2.5	One sided crown – suppressed	2D
27	*M. quinquenervia*	M	13	9	560	580	6.7, 2.6	Bifurcated at 2m – sparse crown	2D
28	*M. quinquenervia*	M	13	4	260	380	3.1, 2.2	G	2A
29	*M. quinquenervia*	M	9	7	130 x 3, 220 (370)	450	4.4, 2.3	F – weak stem junctions	3D
30	*E. robusta*	M	13	7	300	410	3.6, 2.3	A with crown dieback	3B
31	*M. quinquenervia*	M	9	3	140, 70x2 (220)	250	2.6, 1.8	F – suppressed form	3B
32	*M. quinquenervia*	M	11	7	170, 110 (210)	230	2.5, 1.7	F – weak stem junctions	2D
33	*M. quinquenervia*	M	13	6	210, 340 (400)	470	4.8, 2.4	F – weak stem junctions	2D
34	*M. quinquenervia*	M	16	12	630	900	7.5, 3.2	Failed bifurcated stem	4B
35	*M. quinquenervia*	M	9	6	100, 210 (230)	390	2.7, 2.2	G. One sided crown – suppressed	2D
36	*M. quinquenervia*	M	11	6	330	450	3.9, 2.4	F. One sided crown – suppressed	2D
37	*M. quinquenervia*	M	11	8	210, 340, 240 (470)	610	5.6, 2.7	F – weak stem junctions	2D
38	*M. quinquenervia*	M	13	6	240, 300, 300, 200 (530)	650	6.3, 2.7	F – weak stem junctions	2D
39	*E. robusta*	M	16	10	430, 230, 200 (480)	800	5.7, 3.0	G – epicormic stem	2D
40	*M. quinquenervia*	M	10	13	450, 550 (710)	900	8.5, 3.2	Leaning skewed form (lopped stem)	3D
41	*M. quinquenervia*	M	11	6	440	550	5.3, 2.6	F. One sided crown – suppressed.	2D

Tree No	Botanical Name	Age Class	Height – m	Spread - m	D.B.H	D.B.R	TPZ & SRZ Rad.m	Condition comments on trees as seen on site	ULE
42	*E. robusta*	OM (D)	9	6	150, 150 (210)	250	2.5, 1.8	¾ dead	4A
43	*Corymbia (Co.) maculata*	M	19	12	470	660	5.6, 2.7	G – thinning foliage density	2D
44	*Co. maculata*	M	17	7	360	460	4.3, 2.4	G	2A
45	*M. quinquenervia*	M	9	11	310, 310, 400 (590)	650	7.1, 2.7	F – weak stem junctions	2D
46	*E. robusta*	M	19	11	500	750	6.0, 2.9	G	2A
47	*Co. maculata*	M	19	8	400, 330 (520)	840	6.2, 3.1	G - bifurcated at 1m (stable)	2A
48	*E. robusta*	M	14	12	390	550	4.7, 2.6	G	2A
49	*E. robusta*	M	8	8	320	400	3.8, 2.3	F – G. Failed apical growing point	2C
50	*Gone*								
51	*M. armillaris*	M	7	2	130	270	2.0, 2.0	P – sparse foliage density, leaning, basal injury	4A
52	*M. armillaris*	M	8	3	120, 270 (310)	440	3.7, 2.3	P – sparse foliage density, leaning, suppressed	4A
53	*M. quinquenervia*	M	14	12	280, 330, 350 (580)	740	6.9, 2.9	G – bifurcated at 1m, failed branch	2D
54	*M. quinquenervia*	M	14	12	200, 220, 280, 400 (550)	650	6.5, 2.7	F – squat form	4D
55	*M. quinquenervia*	M	14	8	590	590	7.1, 2.7	G – weak stem junctions	2D
56	*M. quinquenervia*	M	14	6	890	940	10.7, 3.2	G – weak stem junctions	2D
57	*M. quinquenervia*	M	14	8	340, 400, 320 (610)	740	7.3, 2.9	F – weak stem junctions. Lean to E.	2D
58	*M. quinquenervia*	M	14	6	600	680	7.2, 2.7	F – weak stem junctions at 2m & 1.2m	2D
58A	*Cupaniopsis (Cu.) anacardioides*	M	8	6	320	410	3.8, 2.3	G	2A
59	*Cu. anacardioides*	M	5	3	140	190	2.0, 1.5	G	2A
60	*Cu. anacardioides*	M	4	3	180	200	2.1, 1.6	G	2A
60A	*Cu. anacardioides*	M	4	5	140	200	2.0, 1.6	F – sparse foliage	3
61	*Cu. anacardioides*	M	5	6	180	210	2.1, 1.6	G	2A
62	*Cu. anacardioides*	M	6	6	170	210	2.0, 1.6	G	2A
63	*Cu. anacardioides*	M	5	6	220	270	2.6, 1.9	G – bifurcated at 0.8	2D
64	*Cu. anacardioides*	M	4	5	170	210	2.0, 1.6	F – sparse foliage	3
66	*Cu. anacardioides*	M	6	5	180	240	2.1, 1.8	G – failed branch on W side	2A
67	*M. quinquenervia*	M	6	4	130, 11 x 2, 170 (210)	300	2.5, 2.0	G – suppressed form	2D
68	*Cu. anacardioides*	M	5	5	190	280	2.2, 2.0	G	2A

Terms used in Tree Survey & Report:
Age Class

(Y) – Young refers to a well-established but juvenile tree. Less than 1/3 life expectancy
(SM) – Semi-mature refers to a tree at growth stages between immaturity and full size. A tree has reached First Adult Form i.e. displays adult characteristics. 1/3 to 2/3 life expectancy
(M)- Mature refers to a full size tree with some capacity for future growth. Older than 2/3 life expectancy
(OM) – Over-mature refers to a tree approaching decline or already declining. Older than 2/3 life expectancy and showing signs of irreversible decline.

Health refers to a tree's vigour, growth rate, disease and/or insects.
Vitality summarises observations about the health and structure of the tree on a scale of: **(G) Good, (F) Fair, (P) Poor, (P) Poor & (D) Dead.**
Good: Tree is generally healthy and free from obvious signs of structural weaknesses or significant effects of pests and diseases or infection;
Fair: Tree is generally vigorous although has some indication of being adversely affected by the early effects of disease or infection or environmental or mechanical damage. Appropriate tree maintenance can usually improve overall health and halt decline;
Poor: Tree in decline and is not likely to improve with reasonable maintenance practices or has a structural fault such as bark inclusion;
Dead: Tree no longer capable of sustained growth.
Deadwood – deadwood found in canopy as a percentage.

Height expressed in metres refers to estimated overall height of tree.

Spread expressed in metres refers to estimated spread of crown at the drip line.

(DBH) Diameter at Breast Height expressed in millimetres refers to the trunk diameter at 1.4 metres above ground level.

(TPZ) Tree Protection Zone & Structural Root Zone (SRZ) as defined by AS 4970 – 2009 Section 3

(ULE) The various ULE categories indicate the useful life anticipated for an individual tree or trees assessed as a group. Factors such as the location, age, condition and vitality of the tree are significant to the determination of this rating. Other influences such as the tree's effect on better specimens and the economics of managing the tree successfully in its location are also relevant to ULE (Barrell 1993, 1995, 2001).

ULE RATING (UPDATED 1/4/01) BARRELL

1.Long ULE: Trees that appear to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	**2.Medium ULE:** Trees that appear to be retainable at the time of assessment for more than 15-40 years with an acceptable level of risk.	**3.Short ULE:** Trees that appear to be retainable at the time of assessment for more than 5-15 years with an acceptable level of risk.	**4.Remove:** Trees that should be removed within the next 5 years.	**5.Small, young or regularly pruned:** Trees that can be reliably moved or replaced.
(A) Structurally sound trees located in positions that can accommodate future growth	**(A)** Trees that may only live between 15 and 40 more years.	**(A)** Trees that may only live between 5 and 15 more years.	**(A)** Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.	**(A)** Small trees less than 5 Metres in height.
(B) Trees that could be made suitable for retention in the long term by remedial tree care.	**(B)** Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.	**(B)** Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.	**(B)** Dangerous trees because of instability or recent loss of adjacent trees.	**(B)** Young trees less than 15 years old but over 5 metres in height.
(C) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	**(C)** Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	**(C)** Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	**(C)** Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.	**(C)** Formal hedges and trees intended for regular pruning to artificially control growth.
	(D) Trees that could be made suitable for retention in the medium term by remedial tree care.	**(D)** Trees that require substantial remedial tree care and are only suitable for retention in the short term.	**(D)** Damaged trees that are clearly not safe to retain.	
			(E) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	
			(F) Trees that are damaging or may cause damage to existing structures within 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.	

Annexure B: Tree location plan with new sewer line in black

Annexure C: Existing & New Stormwater & Sewer Plan

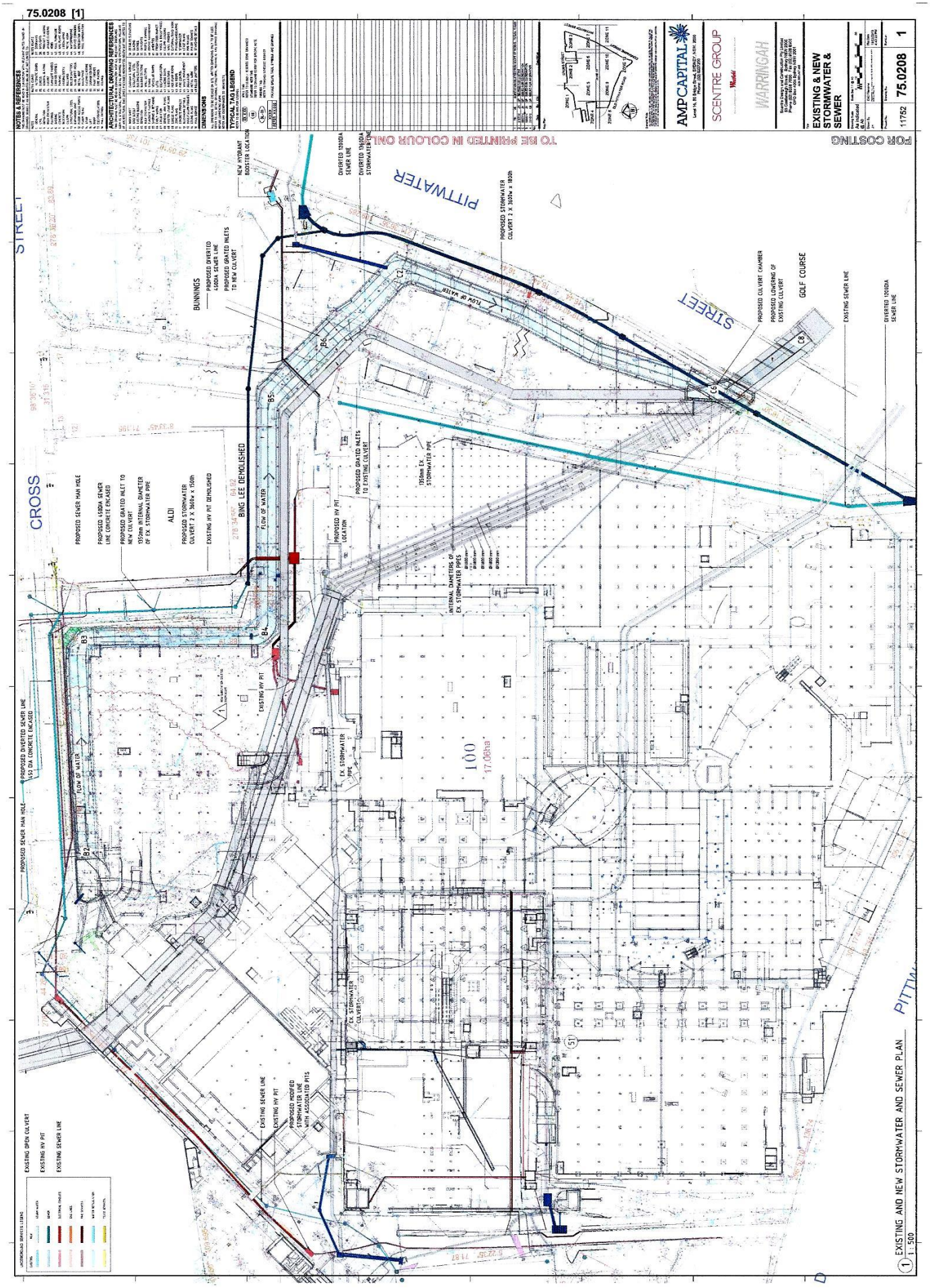

Photo of trees 21, 22, 23, 24 & 25 – typical trees for removal

Photo of trees 61, 62, 63 & 64 – typical trees for retention