Assessor Certificate

Multiple Dwellings

Certificate Version 6.1. Prior versions not valid after 1 March 2006

Issued in accordance with
BASIX Thermal Comfort Simulation Method.

ABSA
Association of Building Sustainability Assessors

Assessor					
Name:	Gavin Chambers	**Company:**	Building Sustainability Assessments	**ABSA #:**	20305
Address:	7 William Street, HAMILTON NSW 2303				
Phone:	(02) 4962 3439	**Fax:**	(02) 4962 3470	**Email:**	enquiries@buildingsustainability.net.au
Declaration of interest:	None				
Client					
Name:		**Company:**	EJE Architecture		
Address:	412 King Street NEWCASTLE NSW 2300				
Phone:		**Fax:**		**Email:**	
Project					
Address:	Lot 1 Edith Street WARATAH NSW 2298				
Applicant:				**Climate Zone:**	15
Assessment					
Date:	16 Nov 11	**File ref:**	6352	**Software:**	BERS **Version:** 4.1

Documentation

All details, upon which this assessment has been based, are included in the project documentation that has been stamped and signed by the Assessor issuing this certificate, as identified below:

Affix assessor stamp

ABSA
Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

Thermal Performance Spec:
Attached, Affixed to drawings Page#: Cover Sheet - A000

Drawings: (Title, Ref.#, Revision, Issue date, etc)
EJE Architecture - Project No: 7480

Building Specifications: (Title, Ref.#, Revision, Issue date, etc)
None

ABSA Assessor Certificate Assessor # 20305 Certificate # 59740941 Issued: 16 Nov 11

Thermal performance specifications

Unit No.	Certificate number	Floor area		Predict. loads (MJ/M^2/y)		
		Cond.	Uncond.	Heat	Cool (Sens & Lat)	
101	59740941	120 0		18	13	
102	48554538	119 0		16	18	
103	76182402	94 0		15	18	
104	34383564	65 0		17	9	
105	22917887	66 0		19	11	
106	22917887	66 0		19	11	
107	14623389	98 0		15	11	
108	62641389	102 0		4	12	
109	22406428	111 0		27	10	
110	21552632	119 0		36	16	
201	39817148	122 0		20	12	
202	50862145	119 0		16	13	
203	46933012	94 0		13	8	

Building Sustainability Assessments					**Ph: 4962 3439**
enquiries@buildingsustainability.net.au					**www. buildingsustainability.net.au**
Important Note for Development Applicants: *The following specification details the requirements necessary to achieve the thermal performance values as indicated on the ABSA Assessor Certificate. Once the development is approved by Council, these specifications will become a condition of consent and must be included in the built works. If you do not want to include these requirements, or need further information, please contact Building Sustainability Assessments.*					
ABSA Assessor #20305		**Certificate # - Refer to stamp**			**November 2011**
Thermal Performance Specifications - BSA Ref: 6352 (Edith Street)					
These are the Specifications upon which the Certified Assessment is based. If they vary from drawings or other written specifications, these Specifications shall take precedence. If only one specification option is detailed for a building element, that specification must apply to all instances of that element for the whole project. If alternate specifications are detailed, the location and extent of the alternate specification must be detailed below and / or clearly indicated on referenced documentation.					
External Wall Construction	*Insulation*	*Colour (Solar Absorptance)*			*Detail*
Brick Veneer & Lightweight	R2.0	Any			
Internal Wall Construction	*Insulation*	*Detail*			
Plasterboard on studs & Brick	none				
Ceiling Construction	*Insulation*	*Detail*			
Plasterboard	R3.5 to ceilings adjacent to roof or decks				
Roof Construction	*Insulation*	*Colour (Solar Absorptance)*			*Detail*
Metal	Foil + R1.0 blanket	Any			
Floor Construction	*Insulation*	*Covering*			*Detail*
Concrete	none	As drawn (if not noted default values used)			
Windows	*Glass and frame type*	*U*	*SHGC*	*Area sq m*	*Detail*
Generic	Single clear Aluminium			As drawn on plans	
Skylights	*Glass and frame type*	*U*	*SHGC*	*Area sq m*	*Detail*
U and SHGC values are according to NFRC. Alternate products may be used if the U value is lower and the SHGC is less then 10% higher or lower then the above figures.					
External Window Cover	*Detail*				
Fixed shading - Eaves	*Width includes guttering, offset is distance above windows*				
Width: 0 Offset: 0	Nominal only, refer to plan for detail				
Fixed shading - Other	*Verandahs, Pergolas (type and description)*				
Shaded areas as drawn					
Ventilation and Infiltration to Habitable Rooms					
Open fire no damper	no	*Exhaust fans no dampers*			no
Door and window seals	yes	*Vented skylights*			no
Vented downlights	no	*Fixed wall or ceiling vents*			no
"No" means that the item was not included in the assessment and shall not be installed.					
Yes to door & window seals means that seals are to be fitted to all external doors and windows.					

ABSA Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

Unit No.	Certificate number	Floor area		Predict. loads (MJ/M^2/y)		
		Cond.	Uncond.	Heat	Cool (Sens & Lat)	
204	67881768	94 0		16	10	
205	27315768	125 0		19	9	
206	27315768	125 0		19	9	
207	67881768	94 0		16	10	
208	62553344	102 0		5	11	
209	79318296	132 0		22	10	
301	39817148	122 0		20	12	
302	29554744	119 0		16	14	
303	25784122	94 0		12	11	
304	67881768	94 0		16	10	
305	94675044	125 0		18	9	
306	94675044	125 0		18	9	
307	45887732	132 0		29	20	
308	77724262	123 0		26	14	
401	39817148	122 0		20	12	
402	29554744	119 0		16	14	
403	25784122	94 0		12	11	
404	67881768	94 0		16	10	
405	94675044	125 0		18	9	
406	94675044	125 0		18	9	
407	45887732	132 0		29	20	
408	77724262	123 0		26	14	
501	75810918	122 0		28	16	
502	79004114	119 0		23	18	
503	57216492	94 0		18	14	
504	33003830	94 0		18	11	
505	33680422	130 0		16	18	
506	84287772	130 0		26	17	
507	26115364	132 0		34	24	
508	68881186	123 0		26	15	
601	12005540	118 7		66	44	
602	91619262	130 0		46	33	
603	91619262	130 0		46	33	
604	24871648	143 0		28	36	

ABSA
Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

BASIX® Certificate

Building Sustainability Index www.basix.nsw.gov.au

Multi Dwelling

Certificate number: 372809M_02

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 29/06/2009 published by the Department of Planning. This document is available at www.basix.nsw.gov.au

This certificate is a revision of certificate number 372809M lodged with the consent authority or certifier on 11 May 2011 with application 10/0527.

It is the responsibility of the applicant to verify with the consent authority that the original, or any revised certificate, complies with the requirements of Schedule 1 Clause 2A, 4A or 6A of the Environmental Planning and Assessment Regulation 2000

Director-General
Date of issue: Wednesday, 16 November 2011
To be valid, this certificate must be lodged within 3 months of the date of issue.

NSW GOVERNMENT Planning & Infrastructure

Project summary		
Project name	6352 - EJE - Maroba Apartments (Apri_02	
Street address	L1 Edith Street Waratah 2298	
Local Government Area	Newcastle City Council	
Plan type and plan number	deposited 1131868	
Lot no.	1	
Section no.	-	
No. of unit buildings	1	
No. of units in unit buildings	47	
No. of attached dwelling houses	0	
No. of separate dwelling houses	0	
Project score		
Water	✓ 40	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 20	Target 20

Certificate Prepared by

Building SustainabilityAssessments

(ABN: 27 131 950 064)

Ph: 02 4962 3439 Fax: 02 4962 3470 Email: enquiries@buildingsustainability.net.au

Revision of Certificates not lodged within 3 months of the date of issue will incur further BASIX issuing fees.

Description of project

Project address	
Project name	6352 - EJE - Maroba Apartments (Apri_02
Street address	L1 Edith Street Waratah 2298
Local Government Area	Newcastle City Council
Plan type and plan number	deposited 1131868
Lot no.	1
Section no.	-

Project type	
No. of unit buildings	1
No. of units in unit buildings	47
No. of attached dwelling houses	0
No. of separate dwelling houses	0

Site details	
Site area (m²)	3008
Roof area (m²)	1112
Non-residential floor area (m²)	0
Residential car spaces	47
Non-residential car spaces	0

Common area landscape	
Common area lawn (m²)	0
Common area garden (m²)	714
Area of indigenous or low water use species (m²)	-

Assessor details	
Assessor number	20305
Certificate number	59740941
Climate zone	15

Project score		
Water	✓ 40	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 20	Target 20

Description of project

The tables below describe the dwellings and common areas within the project

Unit building - Building1, 47 dwellings, 7 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m^2)	Unconditioned floor area (m^2)	Area of garden & lawn (m^2)	Indigenous species (min area m^2)
101	2	120.0	0.0	0	0
105	1	66.0	0.0	0	0
109	2	111.0	0.0	0	0
203	2	94.0	0.0	0	0
207	2	94.0	0.0	0	0
302	2	119.0	0.0	0	0
306	2	125.0	0.0	0	0
402	2	119.0	0.0	0	0
406	2	125.0	0.0	0	0
502	2	119.0	0.0	0	0
506	2	130.0	0.0	0	0
602	2	130.0	0.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m^2)	Unconditioned floor area (m^2)	Area of garden & lawn (m^2)	Indigenous species (min area m^2)
102	2	119.0	0.0	0	0
106	1	66.0	0.0	0	0
110	2	119.0	0.0	0	0
204	2	94.0	0.0	0	0
208	2	102.0	0.0	0	0
303	2	94.0	0.0	0	0
307	2	132.0	0.0	0	0
403	2	94.0	0.0	0	0
407	2	132.0	0.0	0	0
503	2	94.0	0.0	0	0
507	2	132.0	0.0	0	0
603	2	130.0	0.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m^2)	Unconditioned floor area (m^2)	Area of garden & lawn (m^2)	Indigenous species (min area m^2)
103	2	94.0	0.0	0	0
107	2	98.0	0.0	0	0
201	2	122.0	0.0	0	0
205	2	125.0	0.0	0	0
209	2	132.0	0.0	0	0
304	2	94.0	0.0	0	0
308	2	123.0	0.0	0	0
404	2	94.0	0.0	0	0
408	2	123.0	0.0	0	0
504	2	94.0	0.0	0	0
508	2	123.0	0.0	0	0
604	2	143.0	0.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m^2)	Unconditioned floor area (m^2)	Area of garden & lawn (m^2)	Indigenous species (min area m^2)
104	1	65.0	0.0	0	0
108	2	102.0	0.0	0	0
202	2	119.0	0.0	0	0
206	2	125.0	0.0	0	0
301	2	122.0	0.0	0	0
305	2	125.0	0.0	0	0
401	2	122.0	0.0	0	0
405	2	125.0	0.0	0	0
501	2	122.0	0.0	0	0
505	2	130.0	0.0	0	0
601	2	118.0	7.0	0	0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of unit building - Building1

Common area	Floor area (m²)
Car park area (LB)	1950
Garbage rooms (LB)	39
Hallway/lobby type (L1)	115
Hallway/lobby type (L4)	55

Common area	Floor area (m²)
Lift car (No. 1)	-
Community room (L1)	116
Hallway/lobby type (L2)	55
Hallway/lobby type (L5)	76

Common area	Floor area (m²)
Lift car (No. 2)	-
Ground floor lobby type (LB)	50
Hallway/lobby type (L3)	55
Hallway/lobby type (L6)	37

Schedule of BASIX commitments

1. Commitments for unit building - Building1
    - (a) Dwellings
        - (i) Water
        - (ii) Energy
        - (iii) Thermal Comfort
    - (b) Common areas and central systems/facilities
        - (i) Water
        - (ii) Energy

2. Commitments for attached dwelling houses

3. Commitments for separate dwelling houses

4. Commitments for common areas and central systems/facilities for the development (non-building specific)
    - (i) Water
    - (ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for unit building - Building1

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✓	✓	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✓	✓
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✓	✓
(e) The applicant must install:			
(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✓	✓
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✓	✓
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✓	✓	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✓	
(g) The pool or spa must be located as specified in the table.	✓	✓	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✓	✓	✓

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	3 star (> 4.5 but <= 6 L/min)	3 star	5 star	5 star	no	-	-	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✓	✓	✓
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✓	✓
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✓	✓
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✓	✓	✓
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✓	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✓	
(h) The applicant must install in the dwelling:			
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✓	
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and		✓	✓
(cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✓	
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✓	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	gas instantaneous 5 star	individual fan, ducted to façade or roof	interlocked to light	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
601	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	2	0	no	yes	yes	yes	2	yes
104, 105, 106	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1	0	no	yes	yes	yes	0	no
108, 208, 602, 603	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	2	0	no	yes	yes	yes	0	yes
101, 102, 109, 201, 202, 301, 302, 401, 402, 501, 502, 604	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	2	0	no	yes	yes	yes	1	no

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
103, 107, 110, 203, 204, 205, 206, 207, 209, 303, 304, 305, 306, 307, 308, 403, 404, 405, 406, 407, 408, 503, 504, 505, 506, 507, 508	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	2	0	no	yes	yes	yes	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	electric cooktop & electric oven	-	yes	-	-	-	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.			
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.			
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✓	✓
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✓	✓	✓
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✓	✓	✓

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
101	18	13
103	15	18
104	17	9
107	15	11
108	4	12
109	27	10
110	36	16
202	16	13
203	13	8
208	5	11
209	22	10
501	28	16
502	23	18
503	18	14
504	18	11
506	26	17
507	34	24
508	26	15
601	66	44
604	28	36
102, 505	16	18
105, 106	19	11
205, 206	19	9
302, 402	16	14
303, 403	12	11
307, 407	29	20
308, 408	26	14

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
602, 603	46	33
201, 301, 401	20	12
204, 207, 304, 404	16	10
All other dwellings	18	9

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	3 star	5 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/BMS**
Car park area (LB)	ventilation exhaust only	carbon monoxide monitor + VSD fan	fluorescent	daylight sensor and motion sensor	No
Lift car (No. 1)	-	-	fluorescent	connected to lift call button	No
Lift car (No. 2)	-	-	fluorescent	connected to lift call button	No
Garbage rooms (LB)	ventilation exhaust only	-	fluorescent	motion sensors	No
Community room (L1)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No
Ground floor lobby type (LB)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No
Hallway/lobby type (L1)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No
Hallway/lobby type (L2)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No
Hallway/lobby type (L3)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No
Hallway/lobby type (L4)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No
Hallway/lobby type (L5)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No
Hallway/lobby type (L6)	no mechanical ventilation	-	fluorescent	daylight sensor and motion sensor	No

Central energy systems	Type	Specification
Lift (No. 1)	geared traction with V V A C motor	Number of levels (including basement): 7
Lift (No. 2)	geared traction with V V A C motor	Number of levels (including basement): 7

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	3 star	5 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✓" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✓" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✓" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

MAROBA SENIORS LIVING SELF-CARE APARTMENTS

EDITH ST., WARATAH

DRAWING SCHEDULE

A000 COVER SHEET
A200 PROPOSED SITE PLAN
A201 SHADOW DIAGRAMS
A300 BASEMENT FLOOR PLAN
A301 LEVEL 1 FLOOR PLAN
A302 LEVEL 2 FLOOR PLAN
A303 LEVEL 3 FLOOR PLAN
A304 LEVEL 4 FLOOR PLAN
A305 LEVEL 5 FLOOR PLAN
A306 LEVEL 6 FLOOR PLAN
A400 EAST ELEVATION
A401 NORTH ELEVATION
A402 SOUTH ELEVATION
A403 WEST ELEVATION
A404 SECTION A-A
A405 SECTION B-B
A406 SECTION C-C

DEVELOPMENT SCHEDULE

SITE AREA	= 3,008m^2
SITE FRONTAGE WIDTH	= 72.08m
LEVEL 1 GFA	= 1,338m^2
LEVEL 2 GFA	= 1,159m^2
LEVEL 3 GFA	= 1,076m^2
LEVEL 4 GFA	= 1,076m^2
LEVEL 5 GFA	= 1,111m^2
LEVEL 6 GFA	= 617m^2
TOTAL GFA	= 6,377m^2
FLOOR / SPACE RATIO	= 2.1 : 1
LEVEL 1 (3x1-BED. + 4x2-BED. + 3x2-BED+STUDY)	= 10 UNITS
LEVEL 2 (4x2-BED. + 5x2-BED+STUDY)	= 9 UNITS
LEVEL 3 (2x2-BED. + 6x2-BED+STUDY)	= 8 UNITS
LEVEL 4 (2x2-BED. + 6x2-BED+STUDY)	= 8 UNITS
LEVEL 5 (2x2-BED. + 6x2-BED+STUDY)	= 8 UNITS
LEVEL 6 (4x2-BED+STUDY)	= 4 UNITS
TOTAL No. of 1-BED. UNITS	= 3
TOTAL No. of 2-BED. UNITS	= 14
TOTAL No. of 2-BED. + STUDY UNITS	= 30
TOTAL No. of UNITS	= 47
TOTAL No. of BEDROOMS	= 91
TOTAL No. of STUDIES	= 30
No. of CARS	= 47
LANDSCAPED AREA	= 1,380.5m^2 (45.9% of SITE)
MAX. HEIGHT	= 21.25m

ABSA Assessor # 20305 Cert # 59740941 Sign Date 1 Nov 2011

Building Sustainability Assessments Ph: 4962 343
enquiries@buildingsustainability.net.au www.buildingsustainability.net.au

Note for Development Applicants:
The following specification details the requirements necessary to achieve the thermal performance values as detailed on the ABSA Assessor Certificate. Once the development is approved by Council, these specifications will become a condition of consent and must be included in the built works. If you do not want to include these requirements, or need further information, please contact Building Sustainability Assessments.

ABSA Assessor #20305 Certificate # - Refer to stamp November 2011

Thermal Performance Specifications - BSA Ref: 6352 (Edith Street)

These are the Specifications upon which the Certified Assessment is based. If they vary from drawings or other written specifications, these Specifications shall take precedence. If only one specification option is detailed for a building element, that specification must apply to all instances of that element for the whole project. If alternate specifications are detailed, the location and extent of the alternate specification must be detailed below and / or clearly indicated on referenced documentation.

External Wall Construction	*Insulation*	*Colour (Solar Absorptance)*	*Detail*
Brick Veneer & Lightweight	R2.0	Any	
Internal Wall Construction	*Insulation*	*Detail*	
Plasterboard on studs & Brick	none		
Ceiling Construction	*Insulation*	*Detail*	
Plasterboard	R3.5 to ceilings adjacent to roof or decks		
Roof Construction	*Insulation*	*Colour (Solar Absorptance)*	*Detail*
Metal	Foil + R1.0 blanket	Any	
Floor Construction	*Insulation*	*Covering*	*Detail*
Concrete	none	As drawn (if not noted default values used)	

Windows	*Glass and frame type*	*U*	*SHGC*	*Area sq m*	*Detail*
Generic	Single clear Aluminium			As drawn on plans	
Skylights	*Glass and frame type*	*U*	*SHGC*	*Area sq m*	*Detail*

U and SHGC values are according to NFRC. Alternate products may be used if the U value is lower and the SHGC is less then 10% higher or lower then the above figures.

External Window Cover	*Detail*		
Fixed shading - Eaves	*Width includes guttering, offset is distance above windows*		
Width: 0	Offset: 0	*Nominal only, refer to plan for detail*	
Fixed shading - Other	*Verandahs, Pergolas (type and description)*		
Shaded areas as drawn			
Ventilation and Infiltration to Habitable Rooms			
Open fire no damper	no	*Exhaust fans no dampers*	no
Door and window seals	yes	*Vented skylights*	no
Vented downlights	no	*Fixed wall or ceiling vents*	no

"No" means that the item was not included in the assessment and shall not be installed.

Yes to door & window seals means that seals are to be fitted to all external doors and windows

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : COVER SHEET

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	n/a

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A000	F

EJE architecture

SOUTH-EAST APPROACH PHOTO-MONTAGE

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 949
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : SOUTH-EAST APPROACH PHOTO-MONTAGE

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE O RDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	n/a

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A100	C

EJE architecture

SOUTH-EAST PHOTO-MONTAGE

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
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0 10mm 50mm 100mm ON ORIGINAL A3

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DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : SOUTH-EAST PHOTO-MONTAGE

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	n/a

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A101	C

EJE architecture

NORTH-EAST APPROACH PHOTO-MONTAGE

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ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : NORTH-EAST APPROACH PHOTO-MONTAGE

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	n/a

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A102	C

EJE architecture

BRAYE PARK HILL PHOTO-MONTAGE

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 949
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
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0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS
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C	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : BRAYE PARK HILL PHOTO-MONTAGE

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SI TE PRIOR TO THE O RDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN : PH
DATE : DEC 2009
SCALES : n/a
PROJECT No : 7480
PHASE : DA
DRAWING No : A103
REV : C

EJE architecture

BRAYE PARK HILL

ADJOINING MAROBA HOSTEL

EXISTING TREES

PATHWAY FROM COMMUNITY COURTYARD TO BRAYE PARK

ADJOINING CARPARK

APPROPRIATED FOR PIPELINE (9145 WIDE)

BOUNDARY 72700 (2°10'00")

OUTLINE OF FORMER NURSING HOME (NOW DEMOLISHED)

HIGH STREET (UNFORMED)

EASEMENT (4300 WIDE)

WALL S/BACK 1.327

ADJOINING CARPARK

PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

BOUNDARY 36955 (279°45'15")

BOUNDARY 46525 (99°44'05")

BOUNDARY 47010 (279°44'05")

ACCESS DRIVEWAY

ADJOINING MAROBA NURSING HOME

BOUNDARY 72080 (189°43'45")

FOOTPATH

SEWER MAIN

SMH

B'DARY 3660

WATER MAIN

EDITH STREET

GAS MAIN

ADJOINING DWELLING (TYPICAL)

HIGH STREET

40.00E
39.00E
38.00E
37.00E
36.00E
35.00E
34.00E
33.00E
32.00E
31.00E
30.00E

4,340 BALC'Y S/BACK
7,294 WALL S/BACK
11,218 LEVEL 6 WALL S/BACK

13,225 LEVELS 6 WALL S/BACK
9,275 WALL S/BACK
5,155 BALC'Y S/BACK

4,855 WALL S/BACK
5,125 BALC'Y S/BACK
9,515 LEVEL 6 WALL S/BACK

5,155 LEVEL 1 & 2 WALL S/BACK
9,305 LEVEL 3, 4, & 5 WALL S/BACK
11,955 LEVEL 6 WALL S/BACK

PROPOSED SITE PLAN

SCALE - 1 : 250

0 1 2 3 4 5 6 7 8 9 10 m

N

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ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA
Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

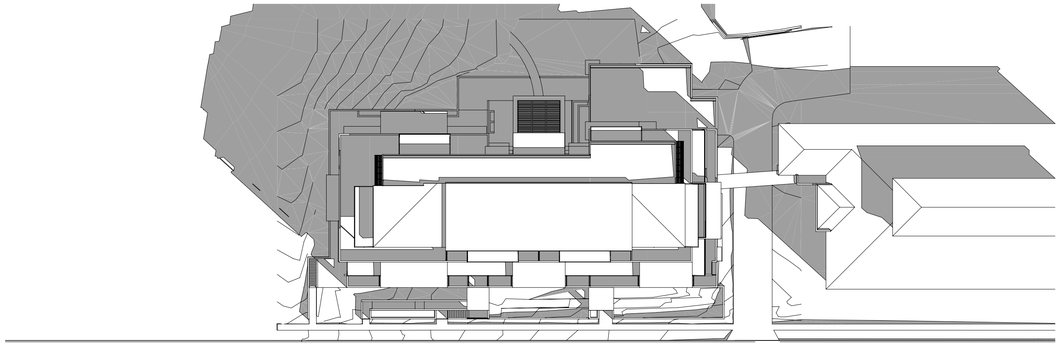
DRAWING : PROPOSED SITE PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

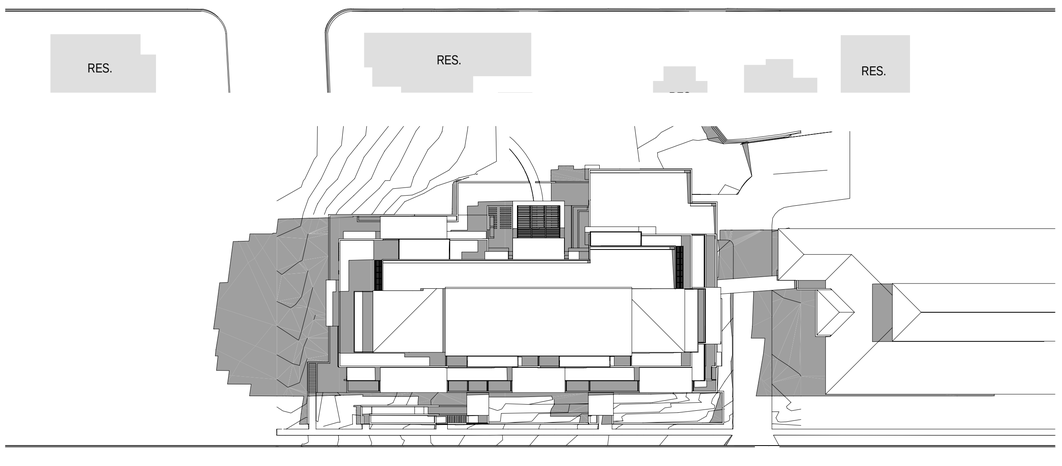
PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A200	F

EJE architecture



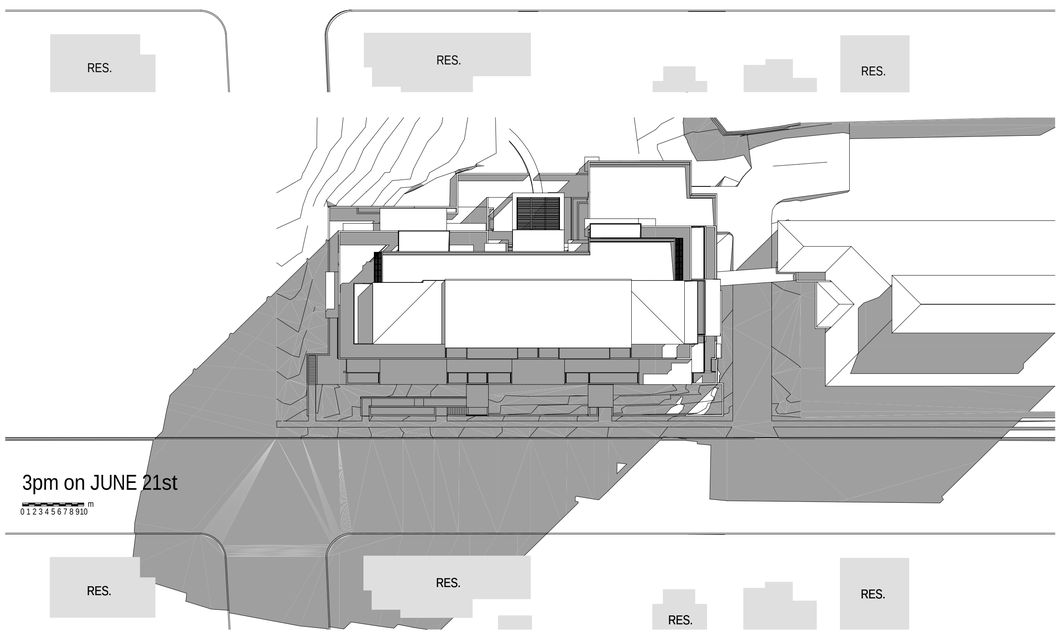
9am on JUNE 21st

0 1 2 3 4 5 6 7 8 9 10 m



12noon on JUNE 21st

0 1 2 3 4 5 6 7 8 9 10 m



3pm on JUNE 21st

0 1 2 3 4 5 6 7 8 9 10 m

SHADOW DIAGRAMS

SCALE - 1 : 500

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
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N

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING
SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868
EDITH ST., WARATAH, NSW.

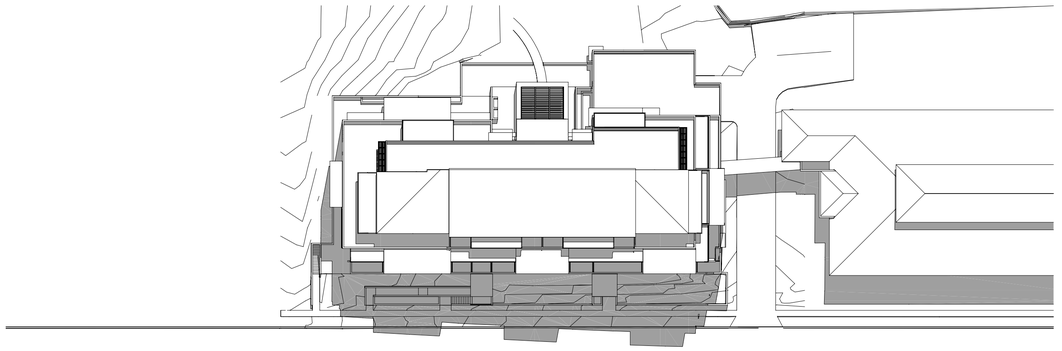
CLIENT : maroba living communities

DRAWING : SHADOW DIAGRAMS

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:500 (A1) 1:1000 (A3)

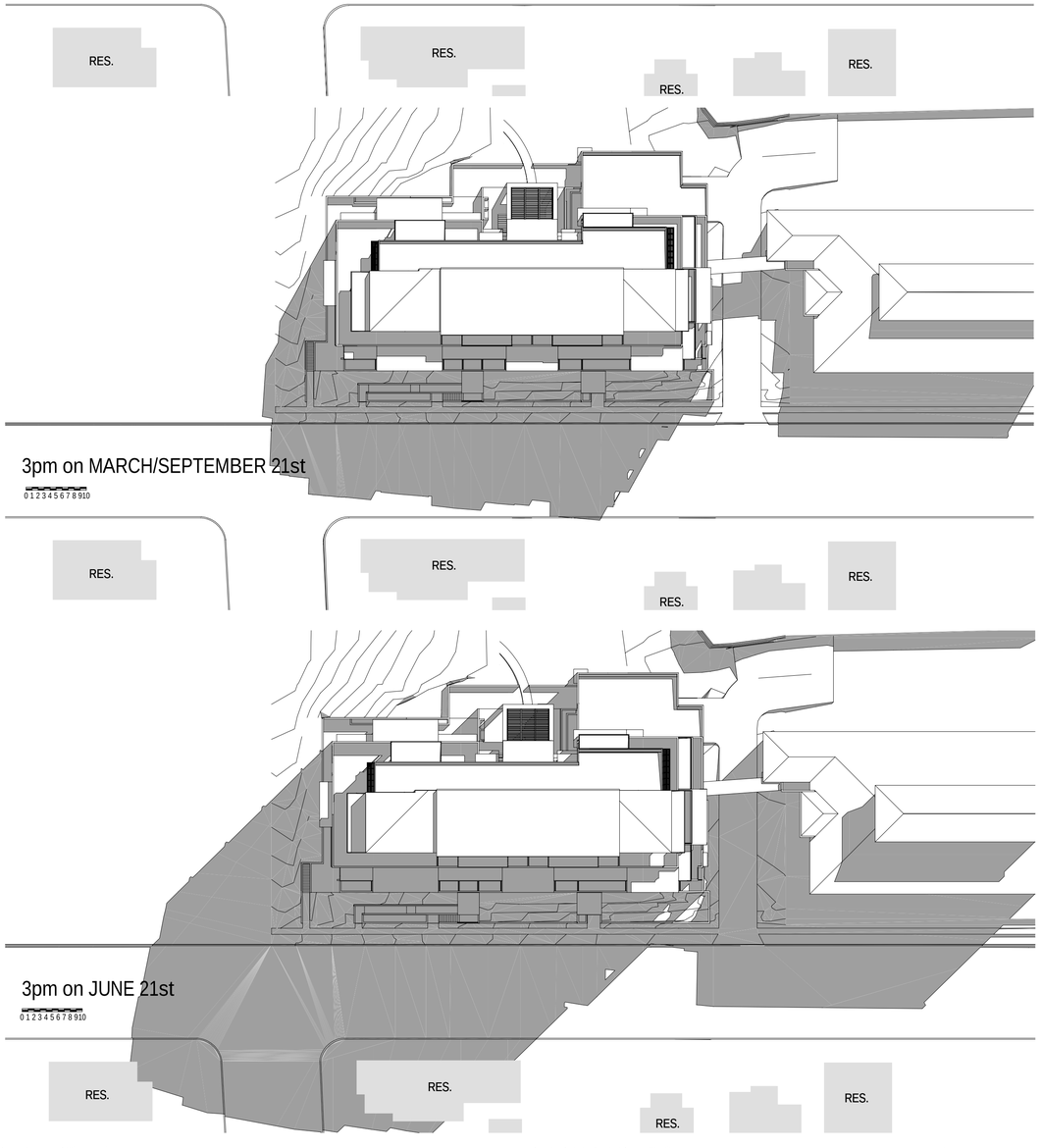
PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A201	C

EJE architecture



3pm on DECEMBER 21st

0 1 2 3 4 5 6 7 8 9 10



3pm on MARCH/SEPTEMBER 21st

0 1 2 3 4 5 6 7 8 9 10

3pm on JUNE 21st

0 1 2 3 4 5 6 7 8 9 10

SHADOW DIAGRAMS 2

SCALE - 1 : 500

EJE ARCHITECTURE
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N

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	03-06-2011	FOR NEIGHBOUR'S INFORMATION
B	14-11-2011	REVISED DA FOR NEIGHBOUR'S INFORMATION

DRN	CHKD	VRFD
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

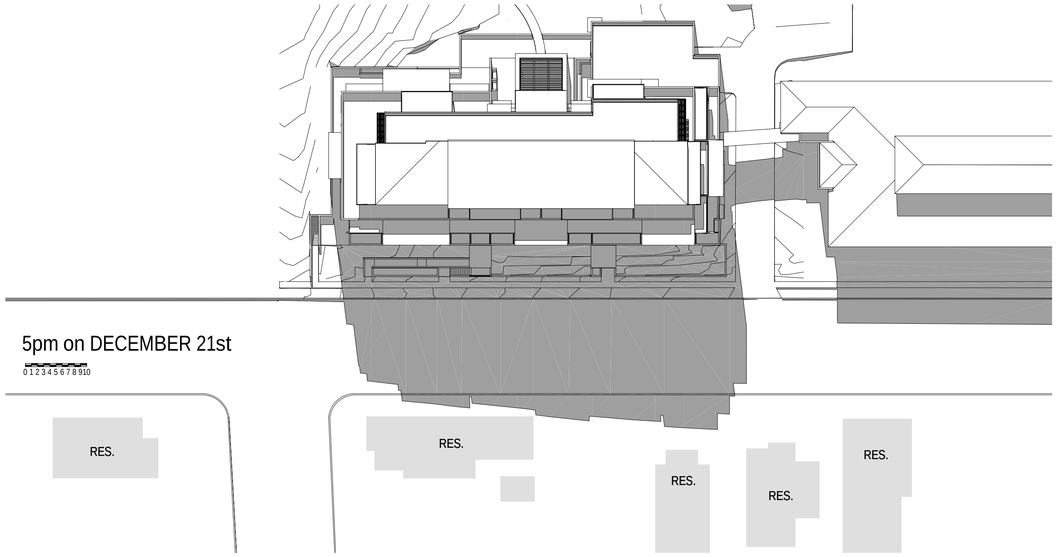
DRAWING : SHADOW DIAGRAMS 2

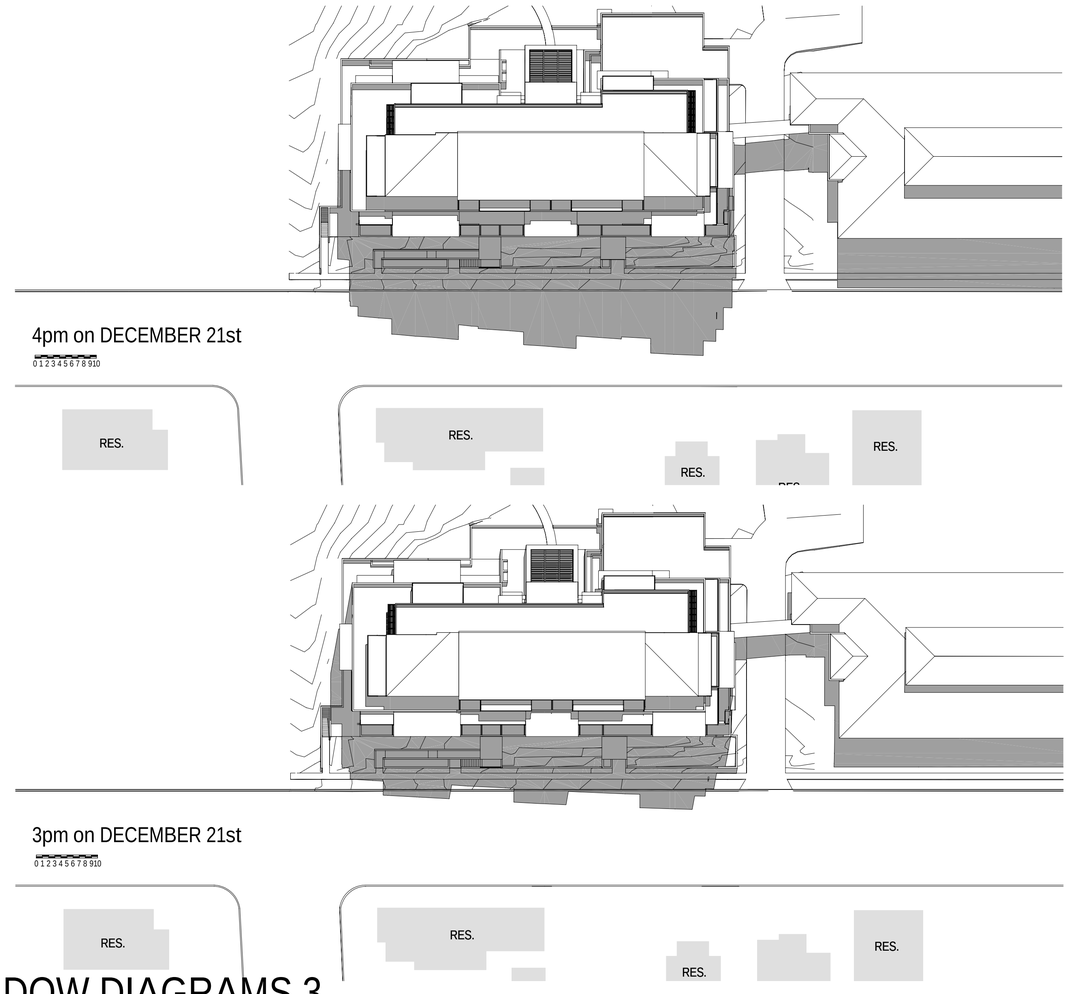
WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

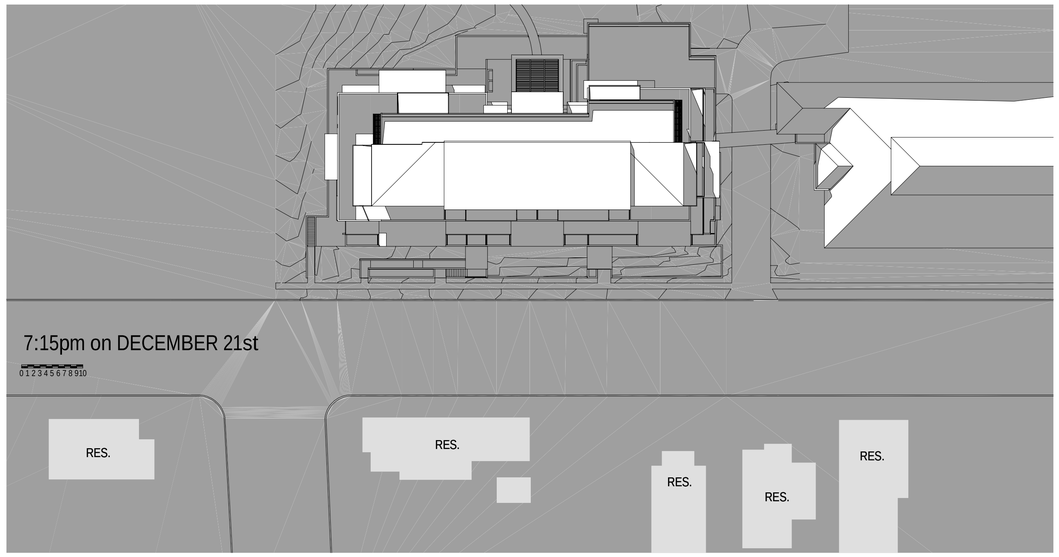
DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:500 (A1) 1:1000 (A3)

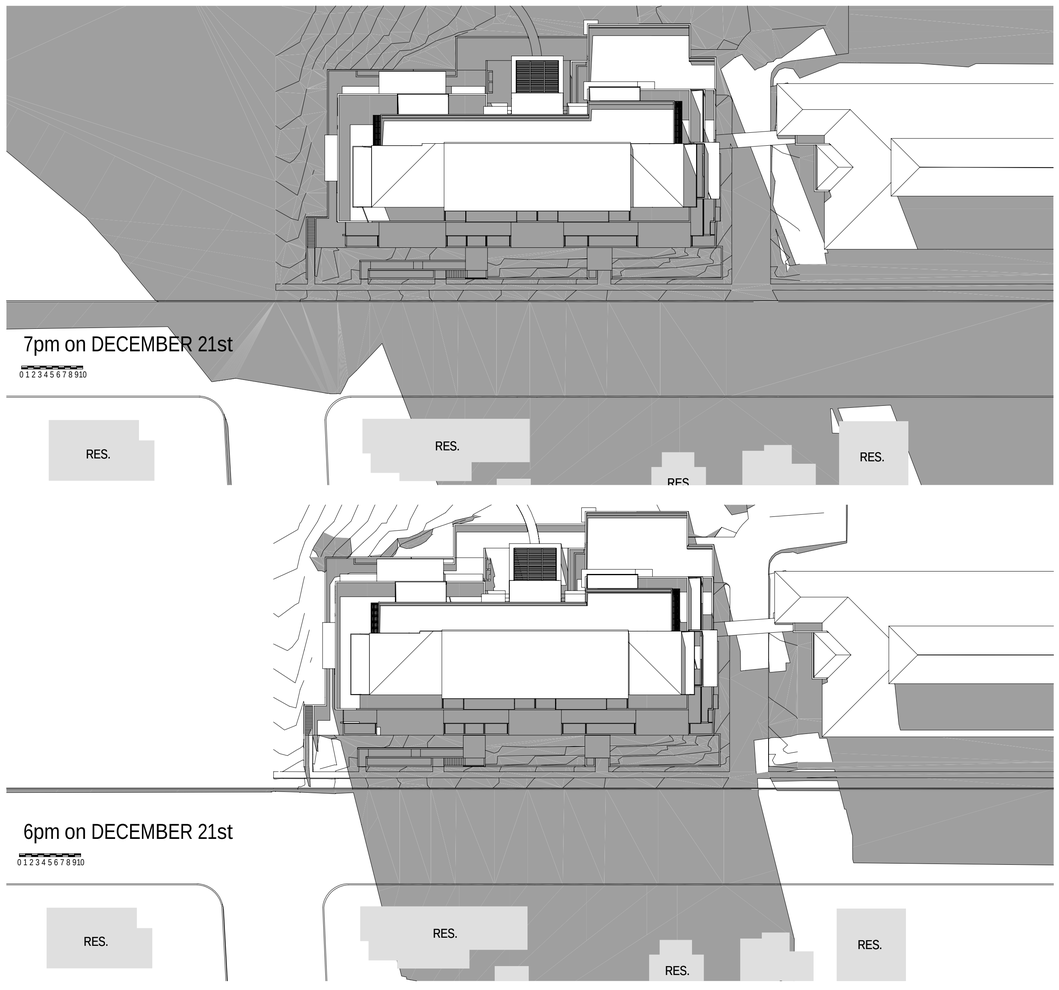
PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A202	B

EJE architecture









SHADOW DIAGRAMS 3

SCALE - 1 : 500

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300
Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

N

REV	DATE	COMMENTS
A	03-06-2011	FOR NEIGHBOUR'S INFORMATION
B	14-11-2011	REVISED DA FOR NEIGHBOUR'S INFORMATION

DRN	CHKD	VRFD
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING
SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868
EDITH ST., WARATAH, NSW.

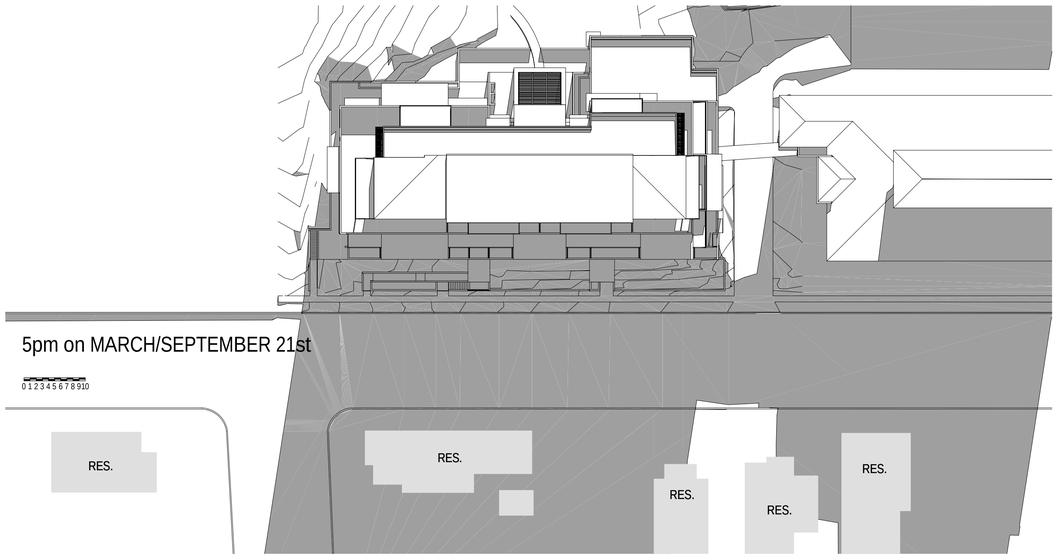
CLIENT : maroba living communities

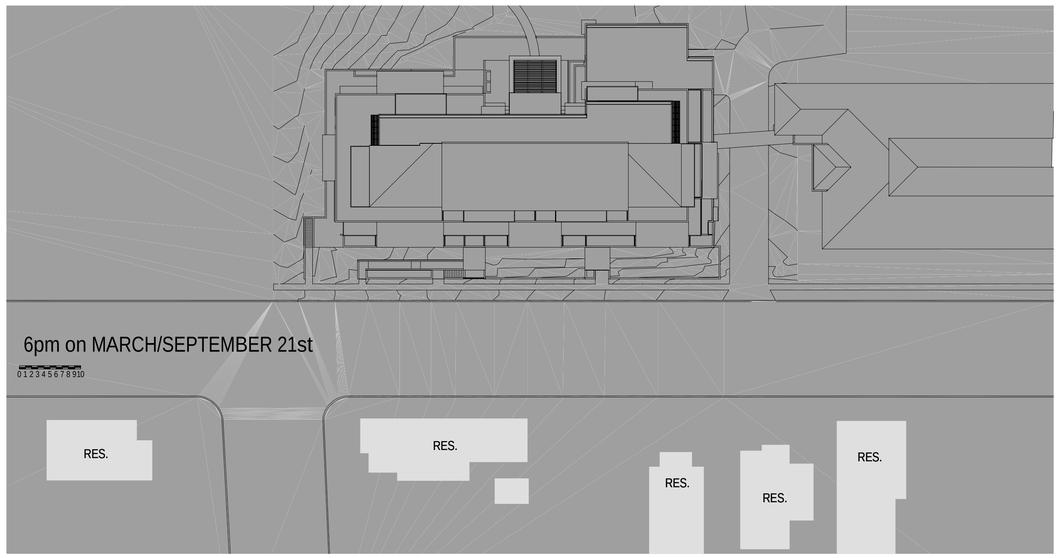
DRAWING : SHADOW DIAGRAMS 3

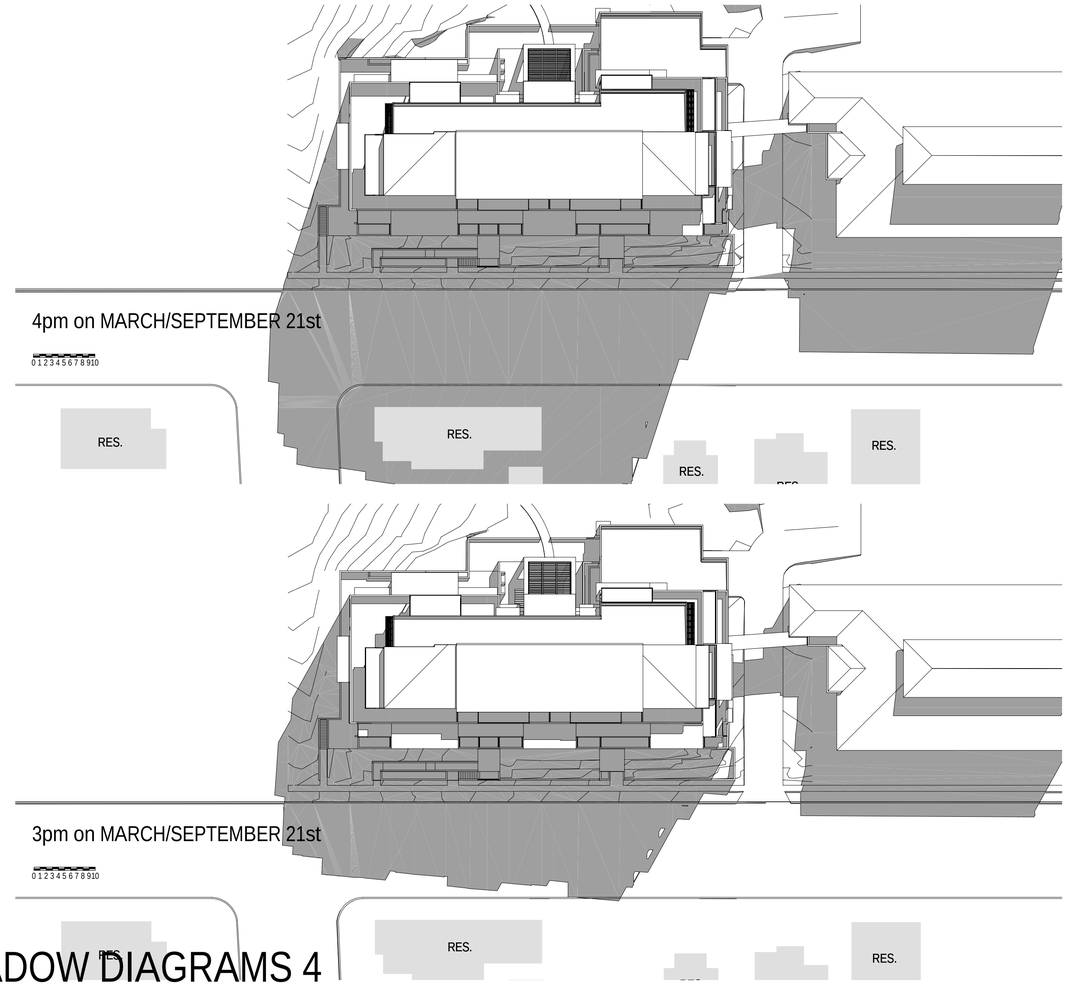
DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:500 (A1) 1:1000 (A3)

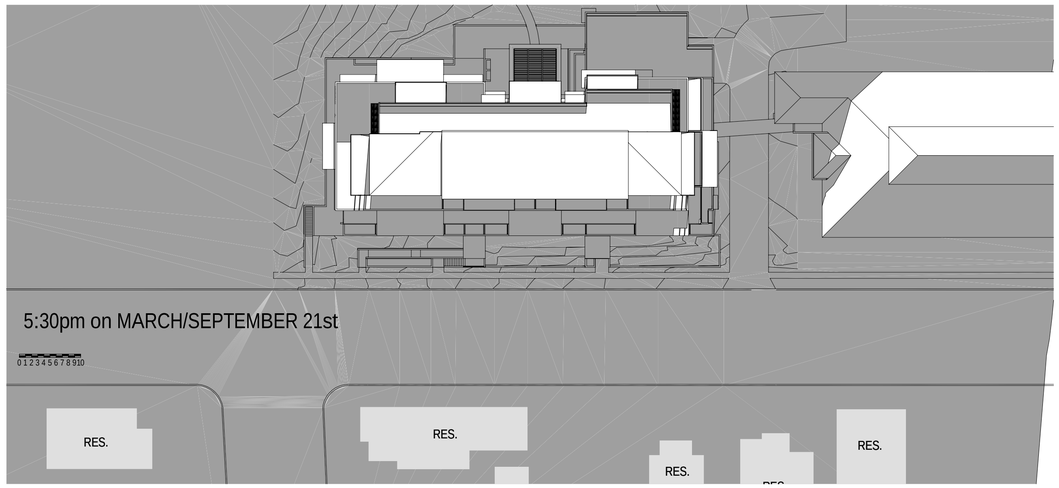
PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A203	B

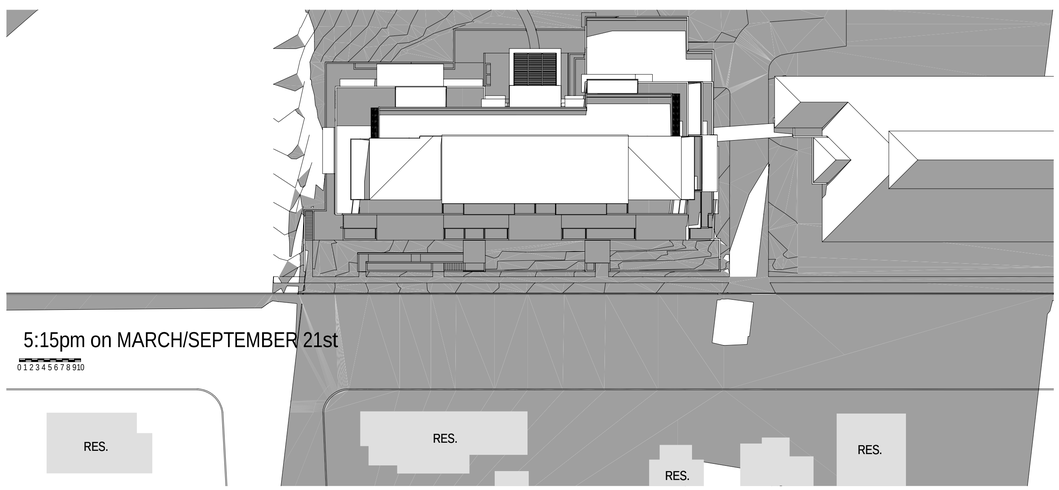
EJE architecture











SHADOW DIAGRAMS 4

SCALE - 1 : 500

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
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Web Site : http://www.eje.com.au

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0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	03-06-2011	FOR NEIGHBOUR'S INFORMATION
B	14-11-2011	REVISED DA FOR NEIGHBOUR'S INFORMATION

DRN	CHKD	VRFD
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING
SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868
EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : SHADOW DIAGRAMS 4

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

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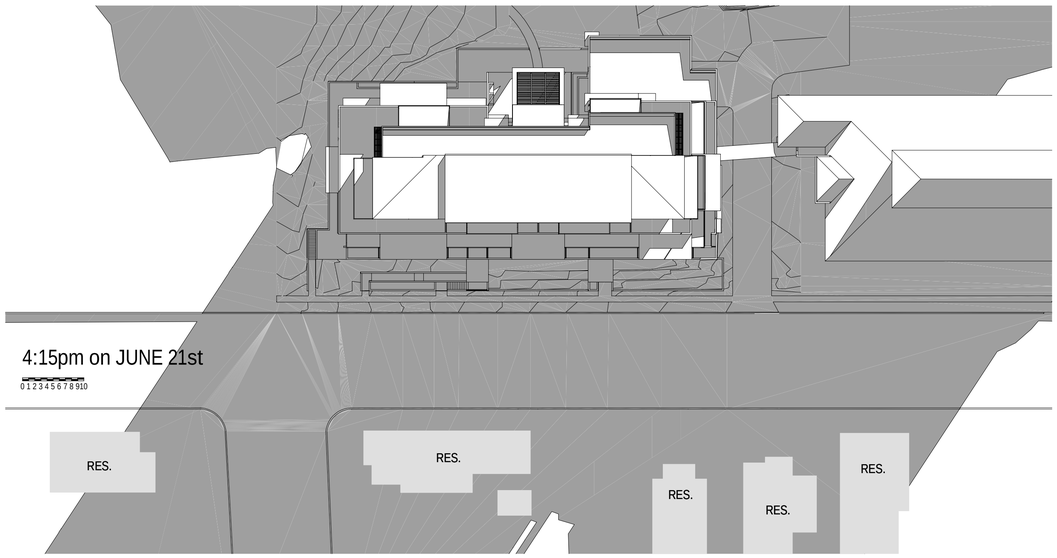
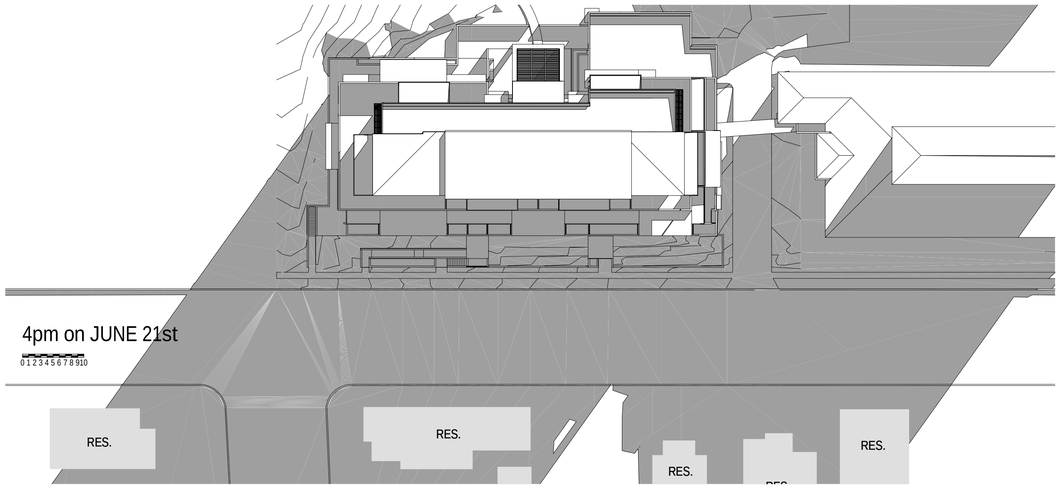
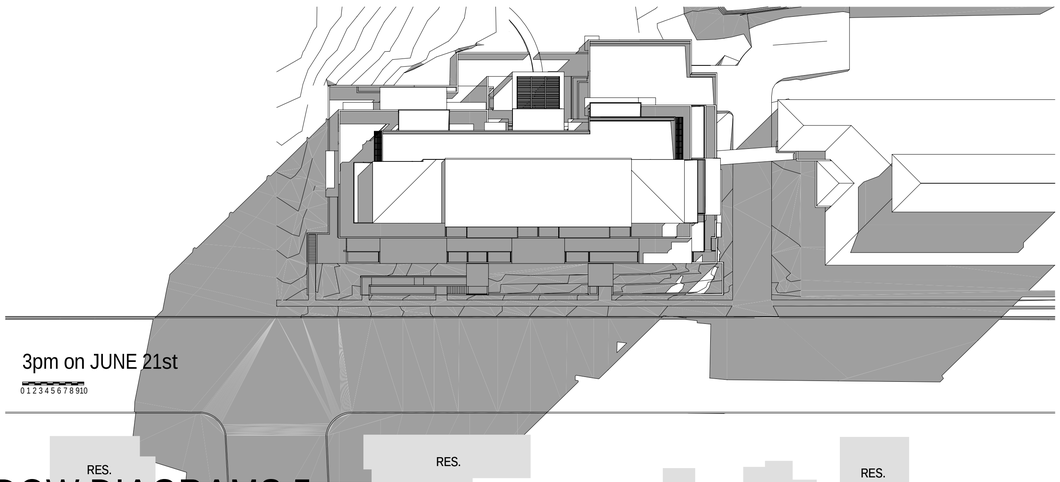
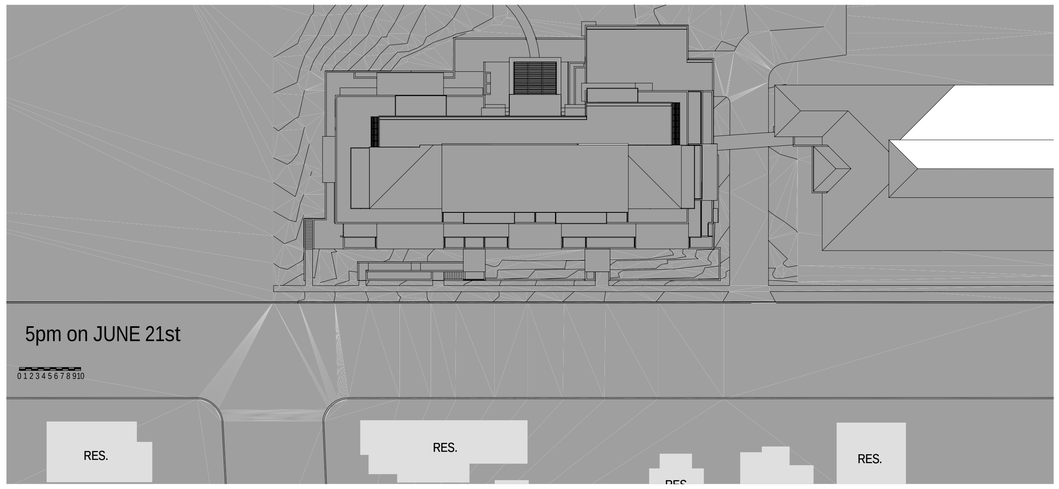
PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A204	B

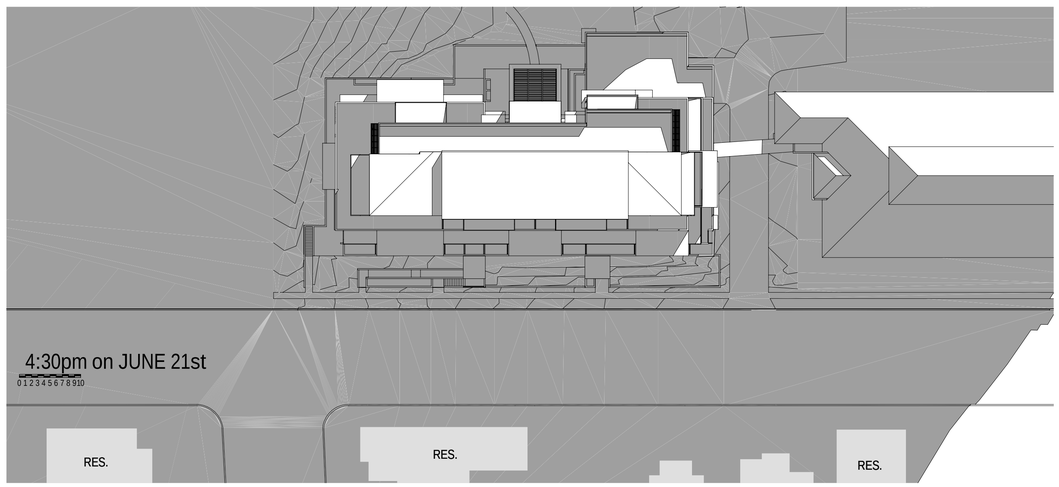
EJE architecture











SHADOW DIAGRAMS 5

SCALE - 1 : 500

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

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0 25mm 100mm 200mm ON ORIGINAL A1

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DRN	CHKD	VRFD
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : SHADOW DIAGRAMS 5

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:500 (A1) 1:1000 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A205	B

EJE architecture

BASEMENT LEVEL FLOOR PLAN

SCALE - 1 : 100

0 1 2 4 10 20 m

CAR PARK
(47 SPACES)
RL 31.80

CARPARK EXHAUST PLENUM TO ABOVE

STORE

RAMP UP @ 1 : 10

CARPARK ENTRY

RL 31.80

RAMP UP @ 1 : 20

BIN STORAGE

LOBBY
RL 31.80

STAIR 1

LIFT 1

SCOOTER CHARGING / STORAGE

STAIR 2

BIN STORAGE

LIFT 2

LOBBY
RL 35.30

BRIDGE OVER

EXISTING DRIVEWAY

EXIT

NORTH ENTRY

STORE

STORE

PATH

LETTER BOXES

FOOT PATH

72.7

72.08

35.03

3.69

46.525

279~44'05"

99~44'05"

47.01

279~45'15"

36.955

3.66

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E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868
EDITH ST., WARATAH, NSW.

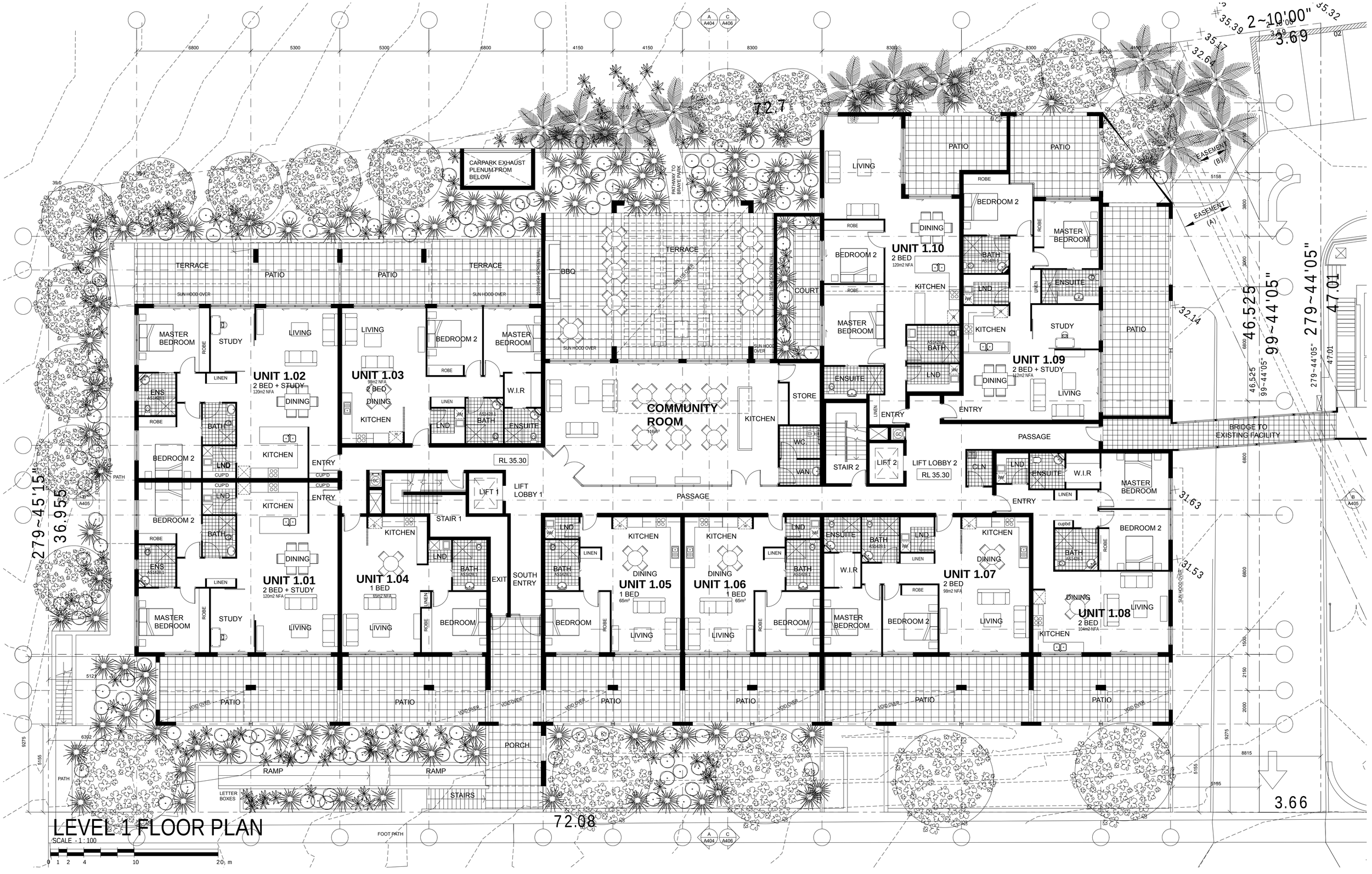
DRAWING : BASEMENT LEVEL FLOOR PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A300	F

EJE architecture



LEVEL 1 FLOOR PLAN

SCALE - 1 : 100

0 1 2 4 10 20 m

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ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

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0 25mm 100mm 200mm ON ORIGINAL A1

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D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA
Assr# 20305 Cert# 59740941
Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

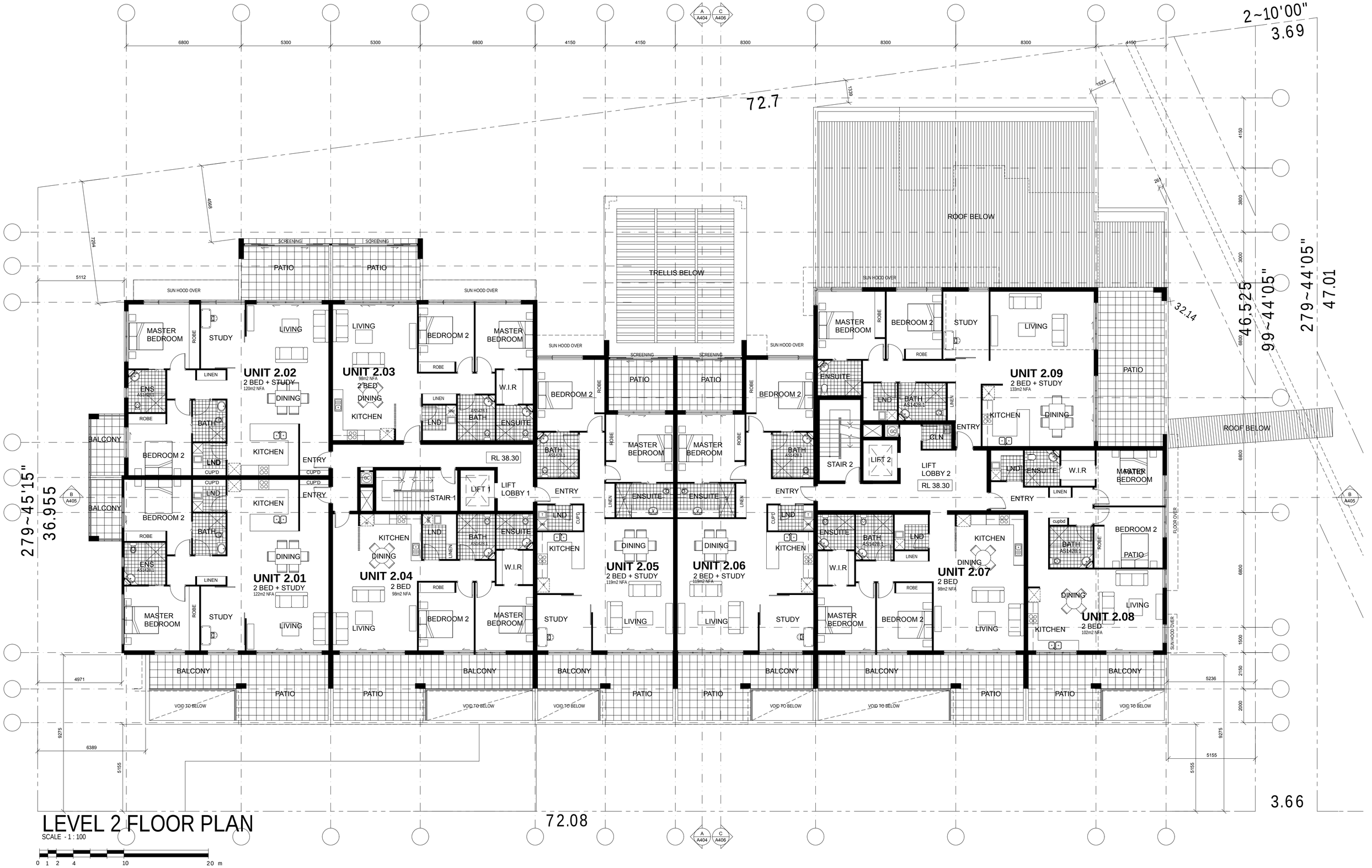
DRAWING : LEVEL 1 FLOOR PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A301	F

EJE architecture



LEVEL 2 FLOOR PLAN

SCALE - 1 : 100

0 1 2 4 10 20 m

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0 25mm 100mm 200mm ON ORIGINAL A1

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D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA Assr # 20305 Cert # 59740941 Sign Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : LEVEL 2 FLOOR PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A302	F

EJE architecture

LEVEL 3 FLOOR PLAN

SCALE - 1 : 100

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ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
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0 25mm 100mm 200mm ON ORIGINAL A1

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DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : LEVEL 3 FLOOR PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

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PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A303	F

EJE architecture

LEVEL 4 FLOOR PLAN

SCALE - 1 : 100

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ABN 82 644 649 849
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Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 | 25mm | 100mm | 200mm ON ORIGINAL A1

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REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	26-02-2011	DA ISSUE	PH	SS	
B	21-04-2011	DA ISSUE FOR LODGEMENT	PH	SS	
C	20-10-2011	PRELIM. REVISED DA ISSUE	PH	SS	
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION	PH	SS	

ABSA Assr# 20305 Cert# 59740941 Sign Date Nov 2011

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : LEVEL 4 FLOOR PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

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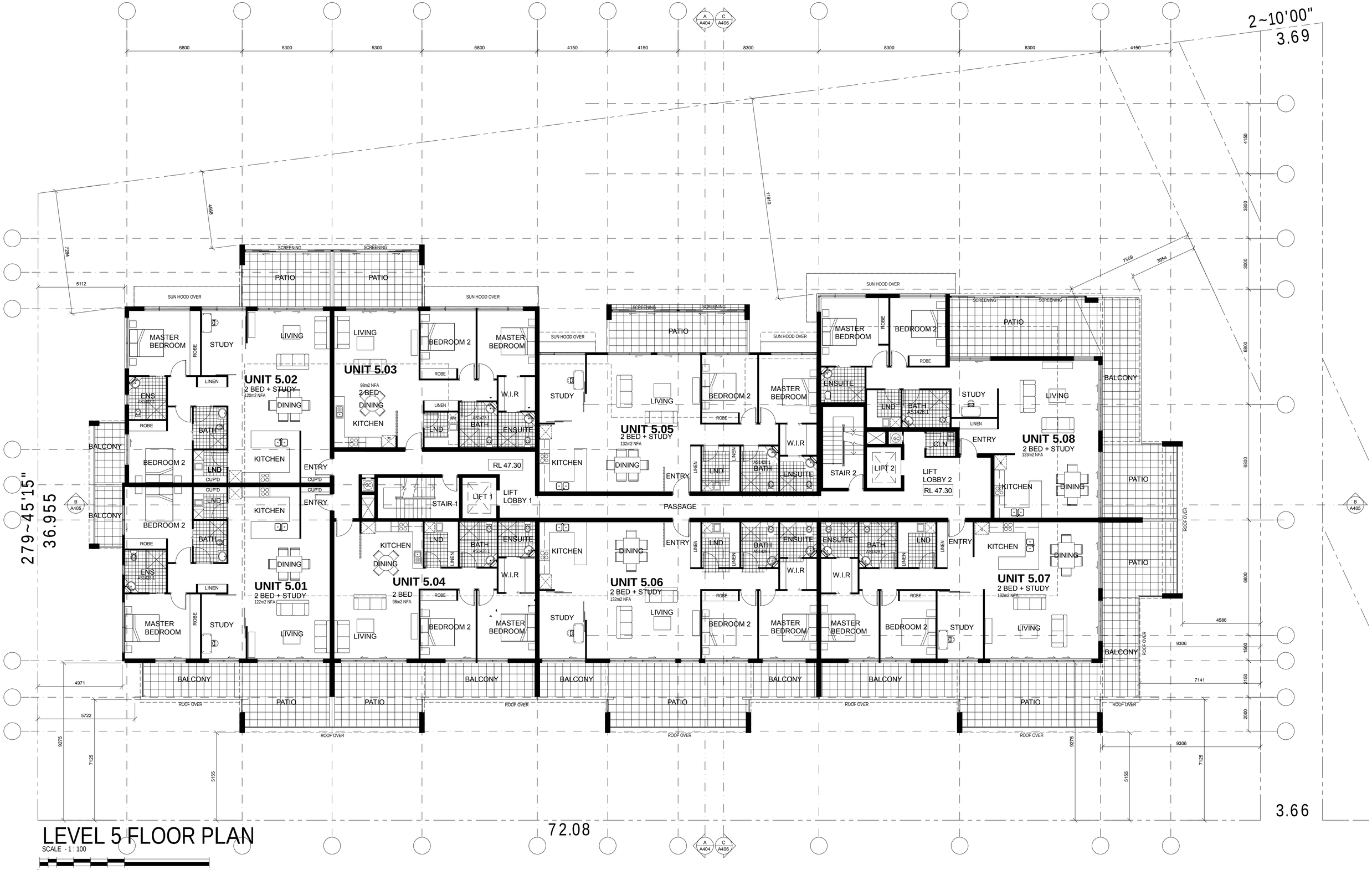
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A304	F

EJE architecture



LEVEL 5 FLOOR PLAN

SCALE - 1 : 100

0 1 2 4 10 20 m

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ACN 002 912 843
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0 25mm 100mm 200mm ON ORIGINAL A1

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Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : LEVEL 5 FLOOR PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

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PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A305	F

EJE architecture

LEVEL 6 FLOOR PLAN

SCALE - 1 : 100

0 1 2 4 10 20 m

UNIT 6.01
2 BED + STUDY
126m2 NFA

UNIT 6.02
2 BED + STUDY
132m2 NFA

UNIT 6.03
2 BED + STUDY
132m2 NFA

UNIT 6.04
2 BED + STUDY
144m2 NFA

LIFT LOBBY 1 RL 50.30

LIFT LOBBY 2 RL 50.30

ROOF BELOW

PATIO ROOF OVER

MAIN ROOF OVER

TRELLIS OVER

SUN HOOD BELOW

SUN HOOD OVER

WALL/ROOF BELOW

SCREENING

ROOF OVER

EJE ARCHITECTURE
ACN 002 912 843
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0 25mm 100mm 200mm ON ORIGINAL A1

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Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : LEVEL 6 FLOOR PLAN

WORK IN F IGURED DIME NSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK, REPORT ALL ERRORS AND OMISSIONS.

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PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A306	F

EJE architecture

EAST ELEVATION

SCALE - 1 : 100

0 1 2 3 4 5 6 7 8 9 10 m

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ACN 002 912 843
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Assr # 20305 Cert # 59740941
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DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : EAST ELEVATION

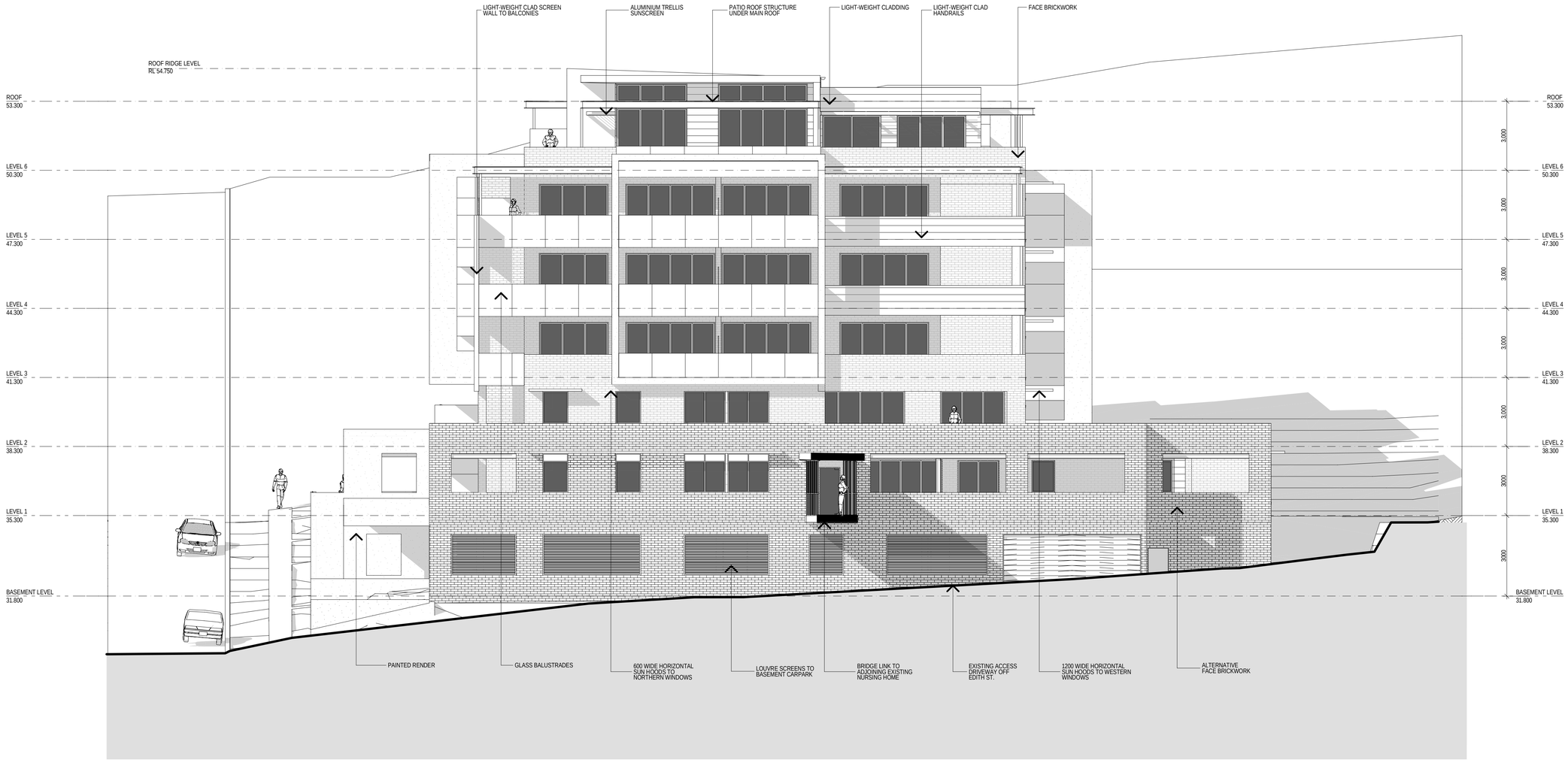
WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A400	F

EJE architecture

0 25mm 100mm 200mm ON ORIGINAL A1



NORTH ELEVATION

SCALE - 1 : 100

0 1 2 3 4 5 6 7 8 9 10 m

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA Assr # 20305 Cert # 59740941 Sign Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : NORTH ELEVATION

WORK IN F IGURED DIME NSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK, REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A401	F

EJE architecture

SOUTH ELEVATION

SCALE - 1 : 100

0 1 2 3 4 5 6 7 8 9 10 m

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 949
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA
Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : SOUTH ELEVATION

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :	
PH	DEC 2009	1:100 (A1) 1:200 (A3)	
PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A402	F

EJE architecture

WEST ELEVATION

SCALE - 1 : 100

0 1 2 3 4 5 6 7 8 9 10 m

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

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Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA
Assr # 20305 Cert # 59740941
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Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

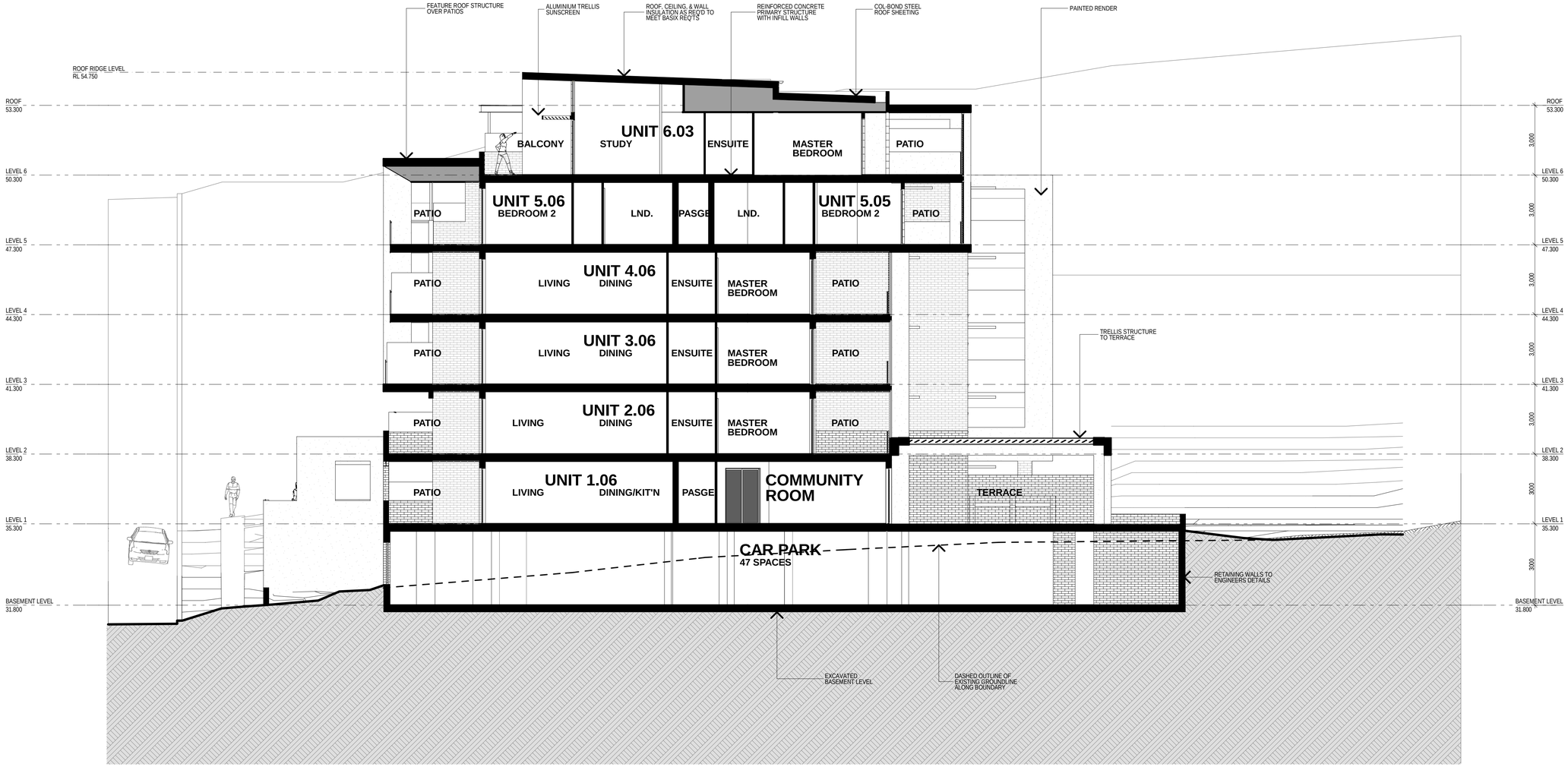
DRAWING : WEST ELEVATION

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A403	F

EJE architecture



SECTION A-A

SCALE - 1 : 100

0 1 2 3 4 5 6 7 8 9 10 m

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
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Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA
Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

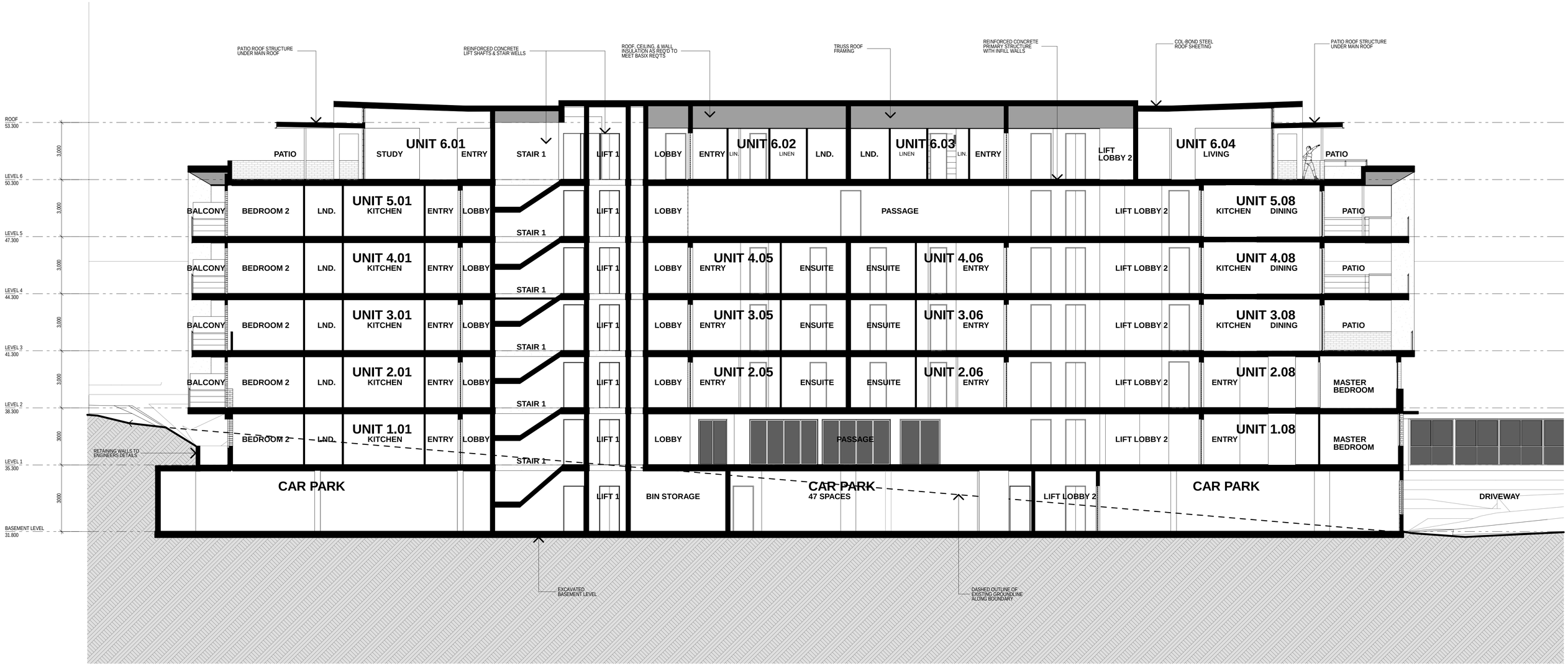
DRAWING : SECTION A-A

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A404	F

EJE architecture



SECTION B-B

SCALE - 1 : 100

0 1 2 3 4 5 6 7 8 9 10 m

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
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Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA
Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

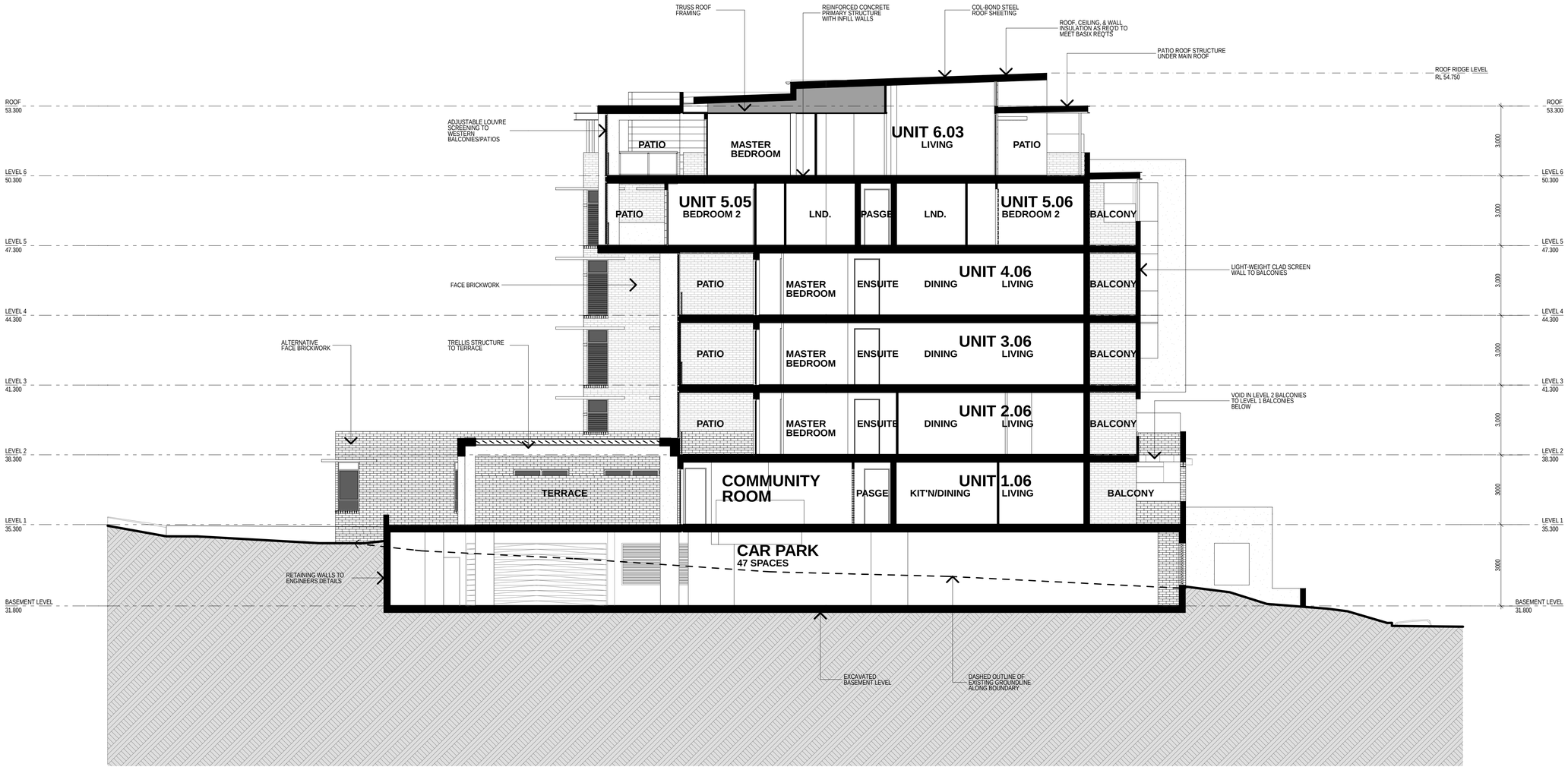
DRAWING : SECTION B-B

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPL ETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A405	F

EJE architecture



SECTION C-C

SCALE - 1 : 100

0 1 2 3 4 5 6 7 8 9 10 m

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 25mm 100mm 200mm ON ORIGINAL A1

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
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E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

ABSA
Assr # 20305 Cert # 59740941
Sign
Date Nov 2011

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

CLIENT : maroba living communities

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

DRAWING : SECTION C-C

WORK IN F IGURED DIME NSIONS IN PREFERENCE T O SCALE. CHECK DIMENSIONS AND LEVEL S ON SITE PRI OR T O THE ORD ERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK, REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:100 (A1) 1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A406	F

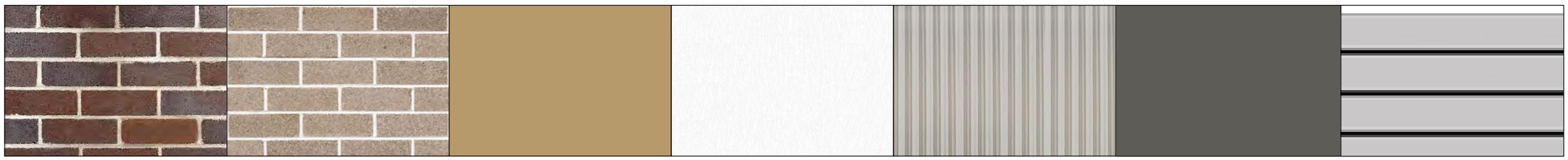
EJE architecture

EAST ELEVATION

SCALE - 1 : 200

0 1 2 3 4 5 6 7 8 9 10 m

EXTERNAL FINISHES SCHEDULE



AUSTRAL BOWRAL 'GERTRUDIS BROWN' FACE BRICKWORK	BORAL 'SILVER SHADOW' FACE BRICKWORK	DULUX 'SWAMP FOX' LIGHT-WEIGHT WALL CLADDING	DULUX 'VIVID WHITE' PAINTED RENDER	COLORBOND 'DUNE' ROOF SHEETING	COLORBOND 'WOODLAND GREY' TRIMS:- GUTTERING, DOWNPIPES, HANDRAILS, POSTS, WINDOW & DOOR FRAMES, GARAGE DOOR, LOUVER SCREENS.	METAL 'LIGHT GREY' CLADDING

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 949
412 King St NEWCASTLE NSW 2300
Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS
A	26-02-2011	DA ISSUE
B	21-04-2011	DA ISSUE FOR LODGEMENT
C	20-10-2011	PRELIM. REVISED DA ISSUE
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

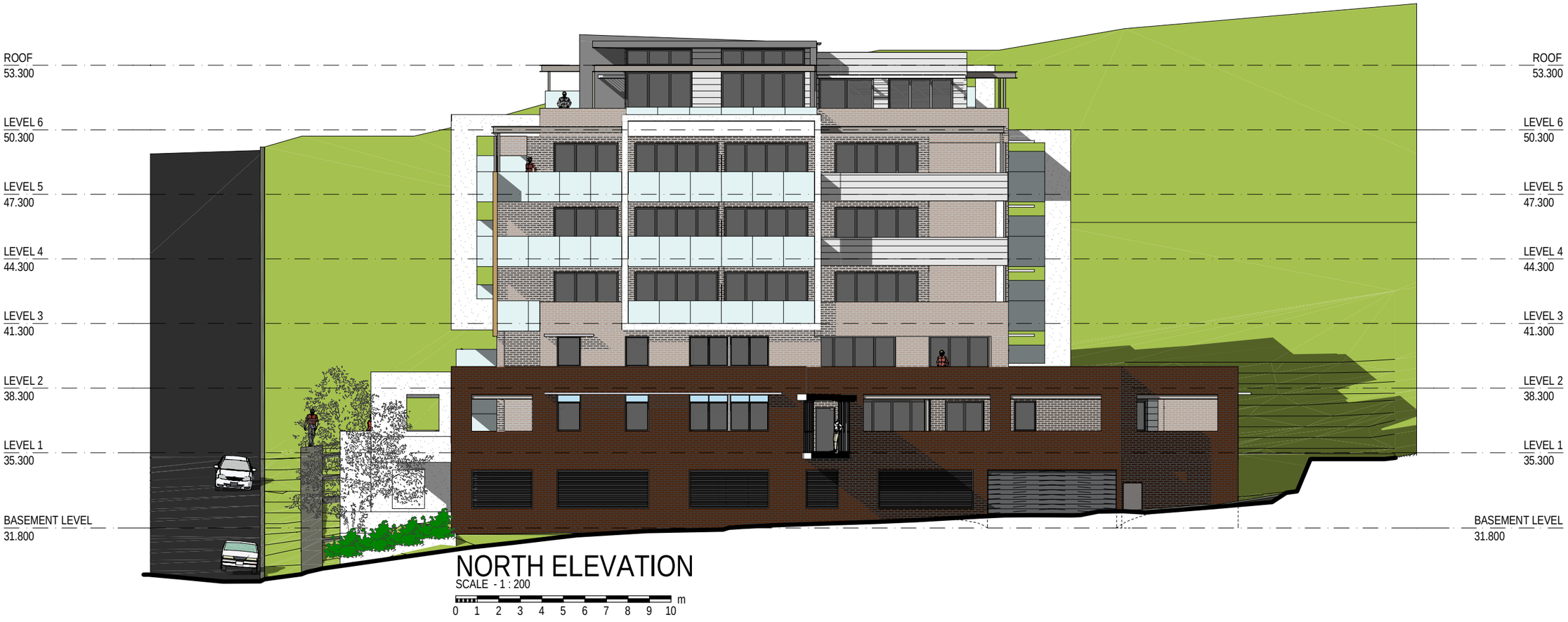
DRAWING : COLOURED EAST ELEVATION

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE O RDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A407	F

EJE architecture

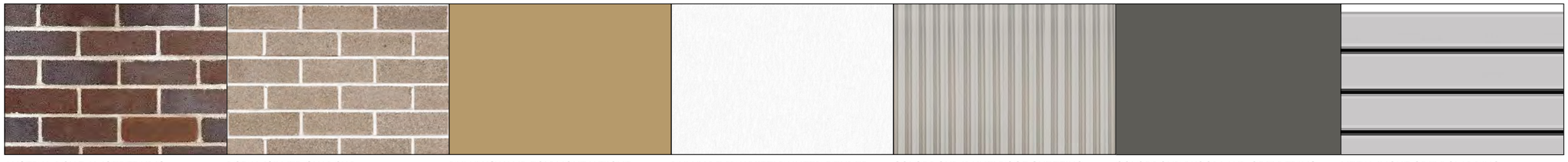


NORTH ELEVATION

SCALE - 1 : 200

0 1 2 3 4 5 6 7 8 9 10 m

EXTERNAL FINISHES SCHEDULE



AUSTRAL BOWRAL 'GERTRUDIS BROWN' FACE BRICKWORK	BORAL 'SILVER SHADOW' FACE BRICKWORK	DULUX 'SWAMP FOX' LIGHT-WEIGHT WALL CLADDING	DULUX 'VIVID WHITE' PAINTED RENDER	COLORBOND 'DUNE' ROOF SHEETING	COLORBOND 'WOODLAND GREY' TRIMS:- GUTTERING, DOWNPIPES, HANDRAILS, POSTS, WINDOW & DOOR FRAMES, GARAGE DOOR, LOUVER SCREENS.	METAL 'LIGHT GREY' CLADDING

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 849
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Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	26-02-2011	DA ISSUE	PH	SS	
B	21-04-2011	DA ISSUE FOR LODGEMENT	PH	SS	
C	20-10-2011	PRELIM. REVISED DA ISSUE	PH	SS	
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION	PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

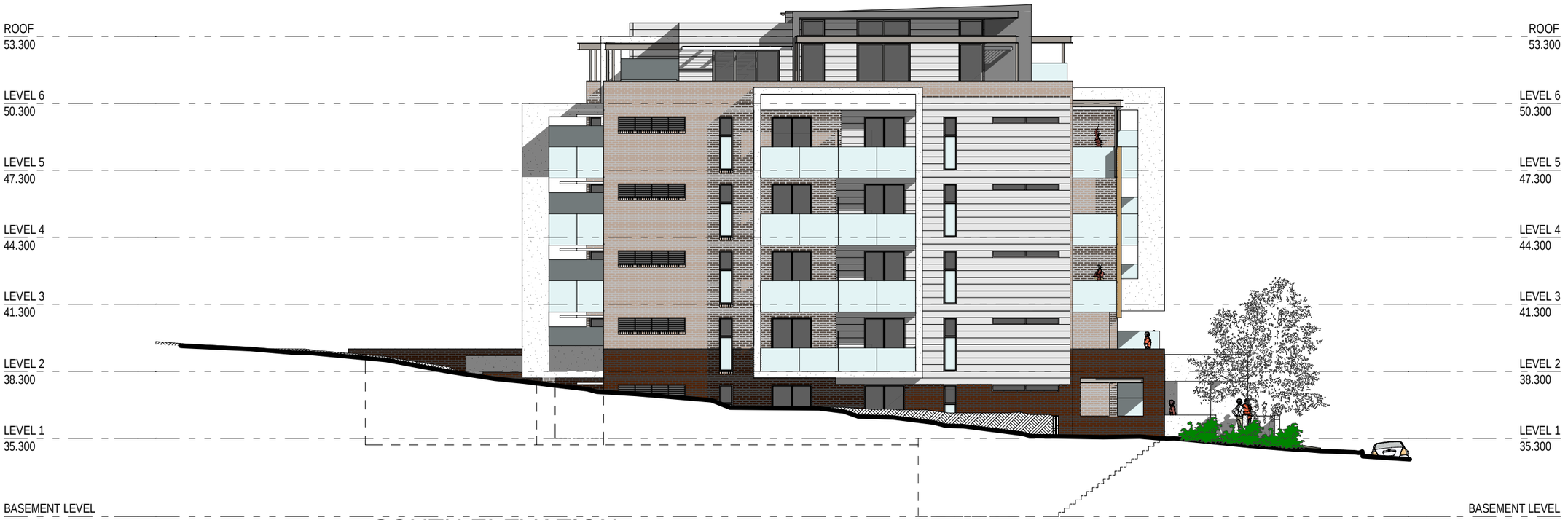
DRAWING : COLOURED NORTH ELEVATION

WORK IN FIGURED DIMENSIONS IN P REFERENCE TO SCALE. CHECK DIMENSIONS AND L EVELS ON SI TE PRIOR TO THE O RDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A408	F

EJE architecture

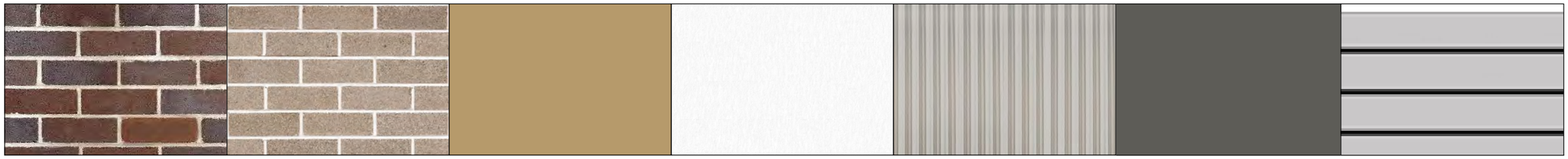


SOUTH ELEVATION

SCALE - 1 : 200

0 1 2 3 4 5 6 7 8 9 10 m

EXTERNAL FINISHES SCHEDULE



AUSTRAL BOWRAL 'GERTRUDIS BROWN' FACE BRICKWORK	BORAL 'SILVER SHADOW' FACE BRICKWORK	DULUX 'SWAMP FOX' LIGHT-WEIGHT WALL CLADDING	DULUX 'VIVID WHITE' PAINTED RENDER	COLORBOND 'DUNE' ROOF SHEETING	COLORBOND 'WOODLAND GREY' TRIMS:- GUTTERING, DOWNPIPES, HANDRAILS, POSTS, WINDOW & DOOR FRAMES, GARAGE DOOR, LOUVER SCREENS.	METAL 'LIGHT GREY' CLADDING

EJE ARCHITECTURE
ACN 002 912 843
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Ph : (02) 4929 2353
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Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	26-02-2011	DA ISSUE	PH	SS	
B	21-04-2011	DA ISSUE FOR LODGEMENT	PH	SS	
C	20-10-2011	PRELIM. REVISED DA ISSUE	PH	SS	
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION	PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : COLOURED SOUTH ELEVATION

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN :	DATE :	SCALES :
PH	DEC 2009	1:200 (A3)

PROJECT No :	PHASE :	DRAWING No :	REV :
7480	DA	A409	F

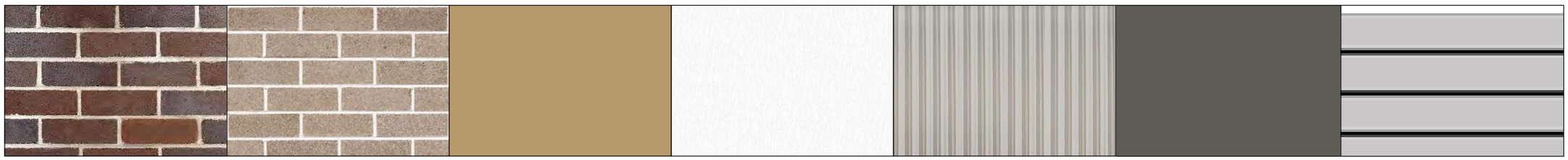
EJE architecture

WEST ELEVATION

SCALE - 1 : 200

0 1 2 3 4 5 6 7 8 9 10 m

EXTERNAL FINISHES SCHEDULE



AUSTRAL BOWRAL 'GERTRUDIS BROWN' FACE BRICKWORK	BORAL 'SILVER SHADOW' FACE BRICKWORK	DULUX 'SWAMP FOX' LIGHT-WEIGHT WALL CLADDING	DULUX 'VIVID WHITE' PAINTED RENDER	COLORBOND 'DUNE' ROOF SHEETING	COLORBOND 'WOODLAND GREY' TRIMS:- GUTTERING, DOWNPIPES, HANDRAILS, POSTS, WINDOW & DOOR FRAMES, GARAGE DOOR, LOUVER SCREENS.	METAL 'LIGHT GREY' CLADDING

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Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	26-02-2011	DA ISSUE	PH	SS	
B	21-04-2011	DA ISSUE FOR LODGEMENT	PH	SS	
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D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION	PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

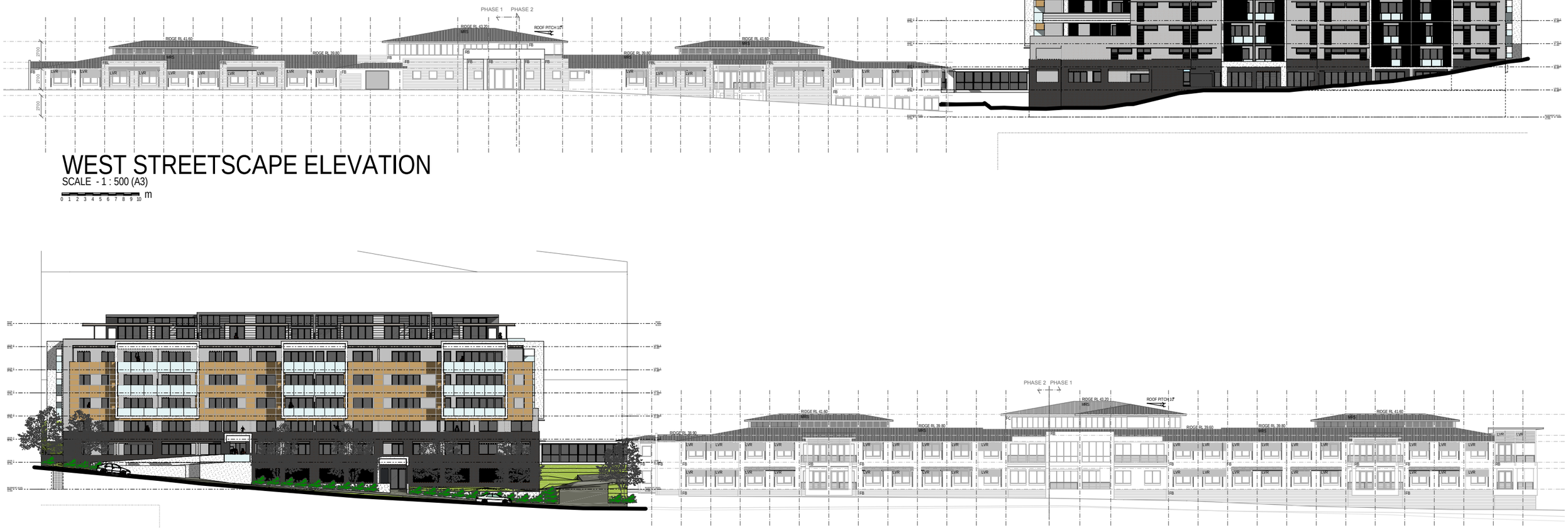
CLIENT : maroba living communities

DRAWING : COLOURED WEST ELEVATION

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN : PH
DATE : DEC 2009
SCALES : 1:200 (A3)
PROJECT No : 7480
PHASE : DA
DRAWING No : A410
REV : F

EJE architecture



WEST STREETSCAPE ELEVATION

SCALE - 1 : 500 (A3)

0 1 2 3 4 5 6 7 8 9 10 m

EAST STREETSCAPE ELEVATION

SCALE - 1 : 500 (A3)

EJE ARCHITECTURE
ACN 002 912 843
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Email : mail@eje.com.au
Web Site : http://www.eje.com.au

0 10mm 50mm 100mm ON ORIGINAL A3

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	26-02-2011	DA ISSUE	PH	SS	
B	21-04-2011	DA ISSUE FOR LODGEMENT	PH	SS	
C	20-10-2011	PRELIM. REVISED DA ISSUE	PH	SS	
D	21-10-2011	AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
E	04-11-2011	FURTHER AMENDED PRELIM. REVISED DA ISSUE	PH	SS	
F	14-11-2011	REVISED DA ISSUE FOR SUBMISSION	PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : COLOURED STREETSCAPE ELEVATIONS

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

DRAWN : PH
DATE : DEC 2009
SCALES : 1:500 (A3) 1:250 (A1)
PROJECT No : 7480
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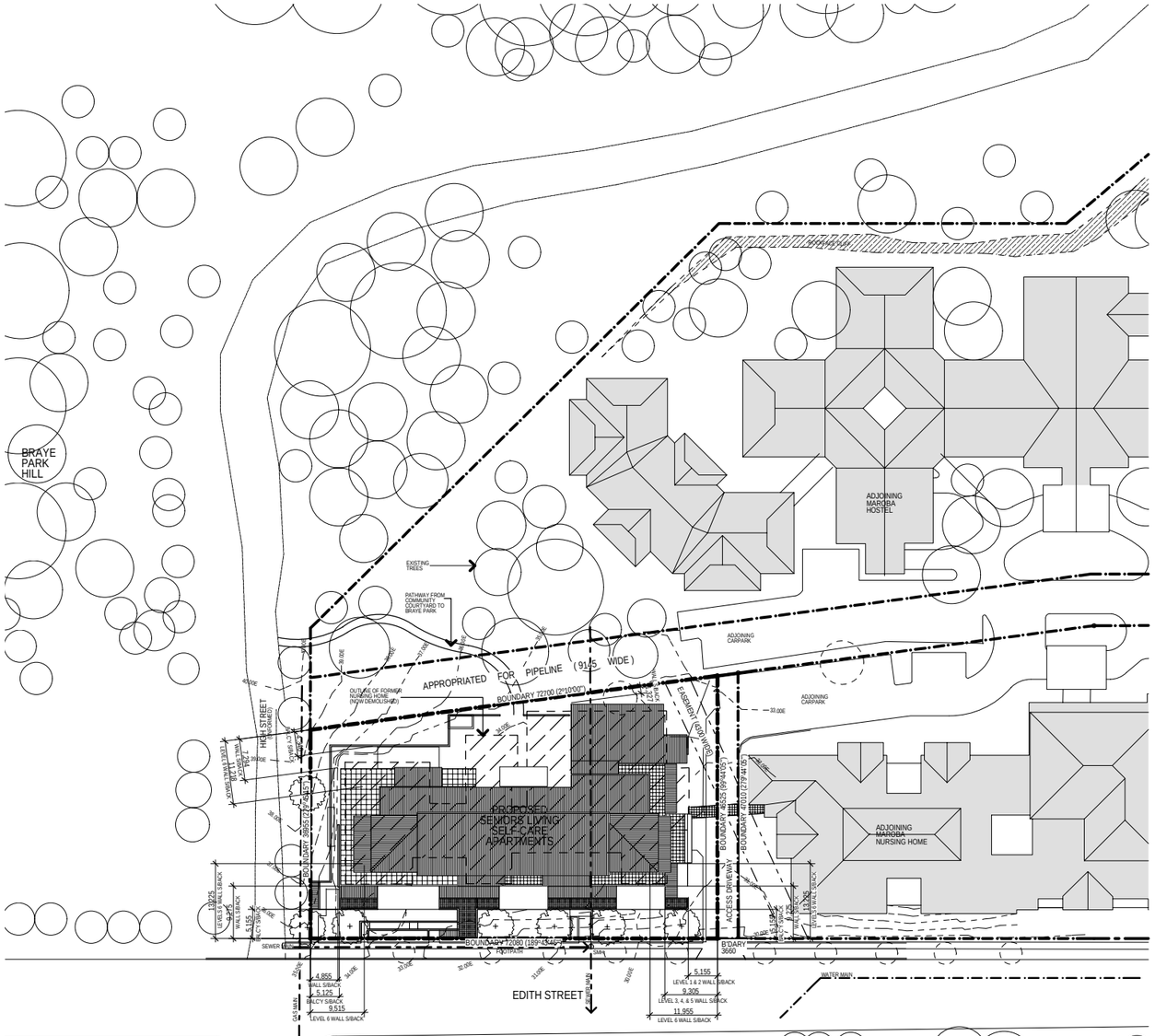

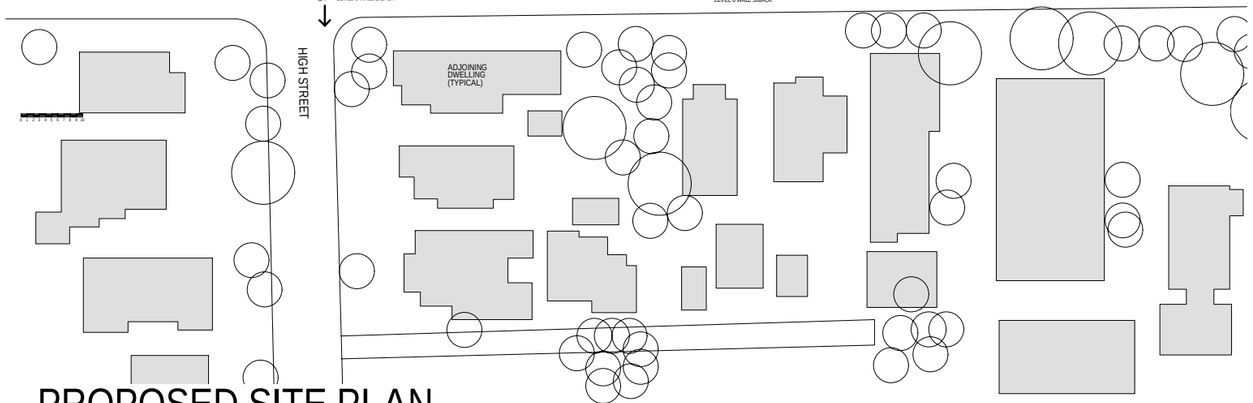

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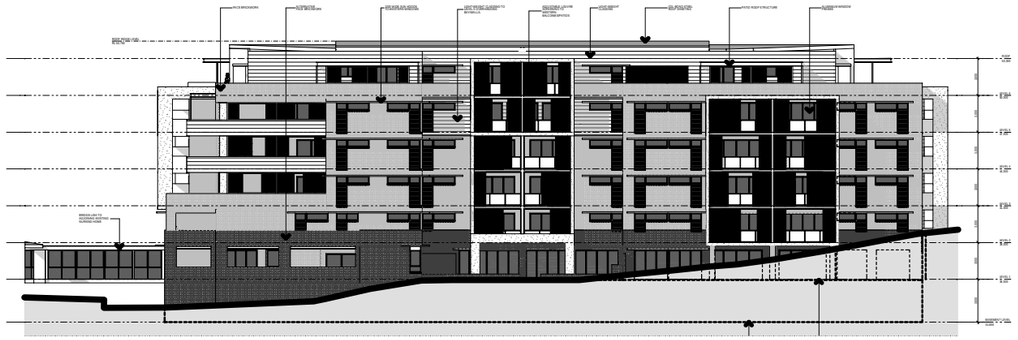

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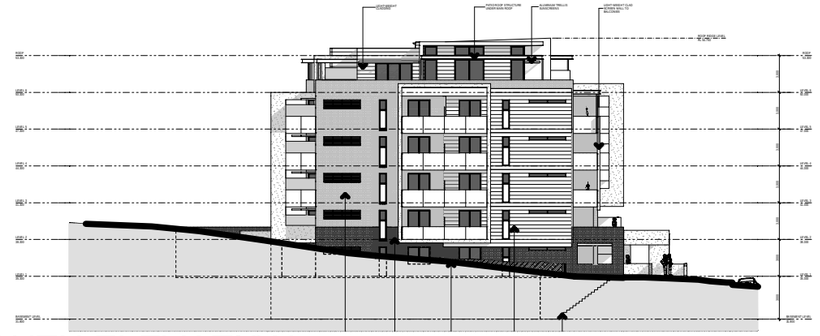
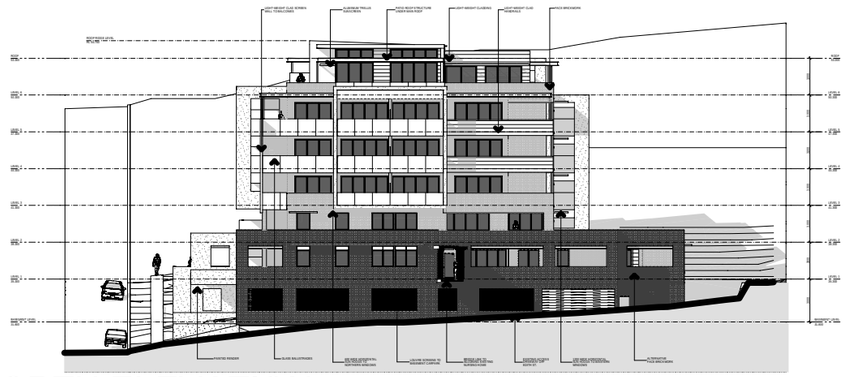


SOUTH ELEVATION



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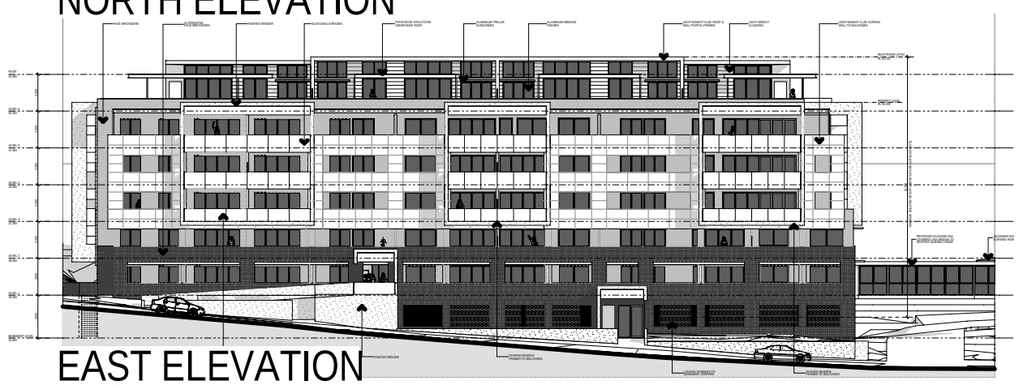

EAST ELEVATION

SCALE - 1 :500

EJE ARCHITECTURE
ACN 002 912 843
ABN 82 644 649 949
412 King St NEWCASTLE NSW 2300

Ph : (02) 4929 2353
Fax : (02) 4926 3069
Email : mail@eje.com.au
Web Site : http://www.eje.com.au

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C	14-11-2011	REVISED DA ISSUE FOR SUBMISSION

DRN	CHKD	VRFD
PH	SS	
PH	SS	
PH	SS	

PROJECT : PROPOSED SENIORS LIVING SELF-CARE APARTMENTS

SITE : LOT 1, DP 1131868 EDITH ST., WARATAH, NSW.

CLIENT : maroba living communities

DRAWING : NOTIFICATION PLAN

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EJE architecture

economic analysis

working together

ADW JOHNSON PTY LIMITED

Economic and Social Analysis Report

Proposed Seniors Independent Living Units (47 Units)

Property:
58 Edith Street, Waratah
Lot 1 DP 1131868

Applicant:
Maroba

Date:
November 2011

adw

project management • town planning • engineering • surveying
visualisation • economic analysis • social impact • urban planning

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ADW Johnson Pty Limited
ABN 62 129 445 398

hunter region
7/335 hillsborough road
warners bay nsw 2282
ph. 02 4978 5100
fax. 02 4978 5199
email. hunter@adwjohnson.com.au

central coast
po box 3717
tuggerah nsw 2259
ph. 02 4305 4300
fax. 02 4305 4399
coast@adwjohnson.com.au

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Executive Summary

This report goes to support the proposal to develop 47 Independent Living Units for the aged and aging in our community.

This report makes clear that the proposal:

- Is consistent with Newcastle Council Planning and Community Policies;
- Is consistent with the NSW Government's legislated policy on Aged Housing (SEPP [Housing for Seniors or People with a Disability] 2004);
- Meets the standards for such developments set out in state guidelines and in fact exceeds them in terms of integrated and progressive level of care;
- Reflects the planning decisions of the Minister for Planning, the Land and Environment Court and the Planning Assessment Commission;
- Supports the finding of the Federal Government's 2010 report on Intergenerational Equity;
- Is based on sound demographic evidence that underpins the existing and escalating demand for purpose built accommodation for members of our community over 65 years of age;
- Delivers significant lifestyle, security and health benefits to residents of facilities such as that proposed at Maroba;
- Delivers significant community and social benefits that are deserving of consideration;
- Goes some way to meet the growing unmet demand for such facilities at local level;
- Is demanded by the local community and has not been found to be "objectionable" throughout a process of broad consultation; and
- On balance, delivers such substantial social benefits that the fact that it 'breaks the planning rules" is of secondary consideration, particularly noting that such variations do not result in adverse impacts and indeed has support of Councils Urban Design Consultative Group.

1.0 The Existing Village

There are currently 23 self care units on the Maroba site. The village atmosphere promotes a feeling of security and community. Regular contact with staff is available through the numerous functions and events taking place each week. Residents can come together and enjoy company, be free to enjoy their individual preferences and pursuits, or take up volunteering opportunities.

The villages two and three bedroom homes, have views across Newcastle and some out to sea. They are designed for seniors living with large, open plan living areas and kitchens which are easily accessed and cleaned with the aim of giving residents' comfort and practicality. Small lawn sizes and attractive gardens provide added recreation and relaxation areas and provide a venue for active gardeners. The village square provides a meeting place to chat with neighbours or for quiet contemplation.

Maroba Lodge Hostel is a contemporarily designed 53 bed home where quality of life for residents is a priority. The ambience of the hostel is inviting and staff are keenly aware of Maroba's vision and mission to provide individualised care with all residents' uniqueness and worth being recognised.

All care assistants hold Certificate III in Aged care or equivalent and ongoing education and advancement of skills is encouraged. All hospitality assistants have certificates in safe food handling practices and all staff receive ongoing training in infection control principles. While in the hostel residents are encouraged to maintain lifelong friendships and external activities as part of their lifestyle. In this regard Lifestyle Co-ordinators provide a wide range of activities that support the continued enjoyment of life skills including the 'men's shed', ladies beauty therapy, knitting circle, shuffle board, and bingo. Maroba also provides special events and bus outings which aim to foster a sense of community and friendship.

Maroba's philosophy is that residents should be able to age in place where possible, however with consideration to residents ongoing safety and welfare, the complex also has a high care facility on site should the need arise. Maroba Lodge provides this service for those elderly residents no longer able to manage their lifestyle within their family home.

Maroba Nursing Home has its roots in aged care firmly established with the provision of excellent care to the community for over 50 years. At Maroba Nursing Home the prime focus is on enabling residents to enjoy a high quality of life. Care programs are individually assessed to meet the needs of the individual. This care is provided by qualified staff. Staff, families and friends are encouraged to actively participate in the care planning and lifestyles of the home's residents. Maroba Nursing Home also hosts a boutique dementia specific unit.

The addition of 47 independent living units is entirely in keeping with the existing design, philosophy and management framework of Maroba and offers a level of service now often referred to as a "vertical village" unparalleled in Newcastle.

2.0 The Proposal

The proposed development involves the construction of a modern six storey building above basement car parking to accommodate the following:

47 seniors living self care apartments comprised of:

- 4 x 1 bedroom;
- 18 x 2 bedroom;
- 25 x 2 bedroom + Study; and
- Total of 115 beds.

The key components of the proposal are as follows:

Basement Floor

- Provision of a 44 space secure basement carpark.
- The carpark will accommodate two way vehicular movement.
- Vehicular entry to the carpark will be provided from a single two way access point from the north. This point of entry to the carpark will be accessed off a driveway from Myall Road to the north of the site.
- Pedestrian access points to the basement carpark will be provided from the following:
  - The Edith Street frontage;
  - Two lifts;
  - An access door at the north western corner of the carpark; and
  - Internal stairwells adjacent to the lifts and at the south eastern and south western sections of the carpark.
- Provision of a central area designated for scooter charging and storage.
- Provision of two bin storage areas.

Floor Level 1

- 11 self care units comprised of:
  - 4 x 1 bedroom;
  - 4 x 2 bedroom; and
  - 3 x 2 bedroom + study.
- Community room with patio.
- Private balconies for units 1.01, 1.05, 1.06, 1.08, 1.09, 1.10 and 1.11.
- Private patios for units 1.02 – 1.03 and 1.07.
- Pedestrian entry to Floor Level 1 will be provided from (1) the Edith Street frontage and (2) an entry at the northern side of the building.
- Two lifts and adjacent stairwells will be available.

Floor Level 2

- 10 self care units comprised of:
  - 5 x 2 bedroom; and
  - 5 x 2 bedroom + study.
- Private balconies will be provided for all units.
- Access to units 2.01 – 2.05 will be provided from lift 1 and an adjacent stairwell.
- Access to units 2.06 – 2.10 will be provided from lift 2 and an adjacent stairwell.

Floor Level 3

- 9 self care units comprised of:
  - 5 x 2 bedroom; and
  - 4 x 3 bedroom.
- Private balconies will be provided for all units.
- Access to units 3.01 – 3.05 will be provided from lift 1 and an adjacent stairwell.
- Access to units 3.06 – 3.09 will be provided from lift 2 and an adjacent stairwell.

Floor Level 4

- 7 self care units comprised of:
  - 2 x 2 bedroom; and
  - 5 x 2 bedroom + Study.
- Private balconies will be provided for all units.
- Access to units 4.01 – 4.03 will be provided from lift 1 and an adjacent stairwell.
- Access to units 4.04 – 4.07 will be provided from lift 2 and an adjacent stairwell.

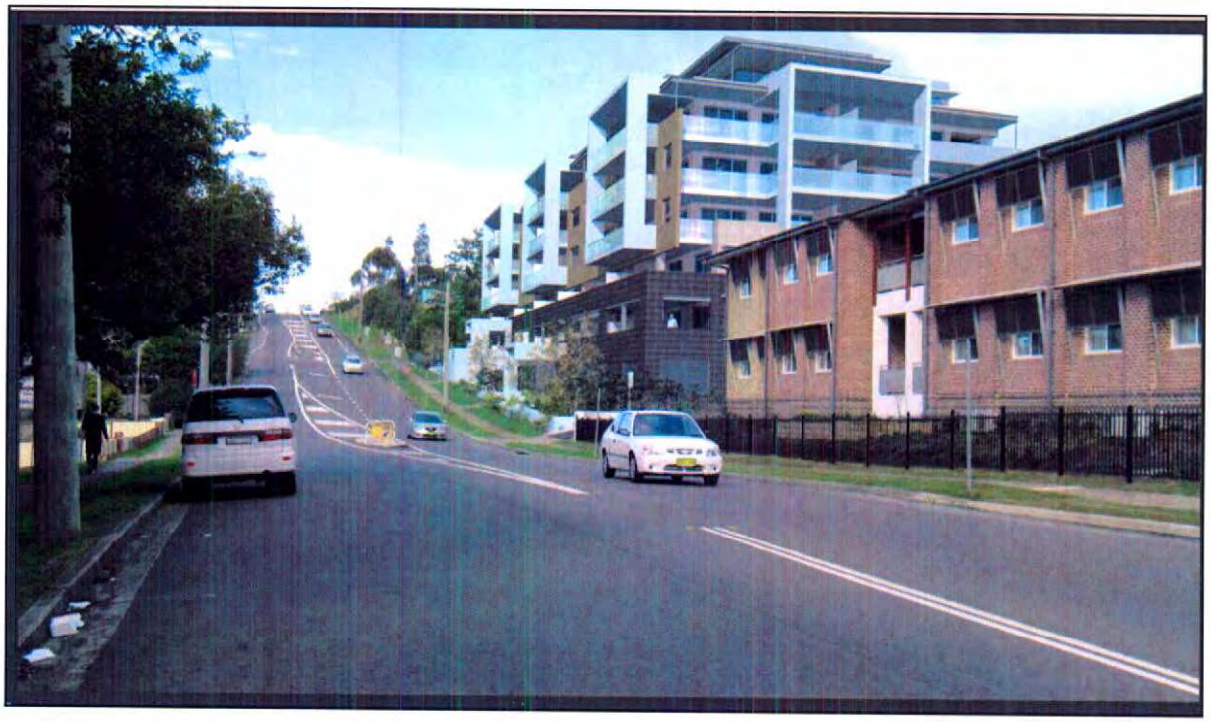
Floor Level 5

- 7 self care units comprised of:
  - 2 x 2 bedroom; and
  - 5 x 2 bedroom + study.
- Private balconies will be provided for all units.
- Access to units 5.01 – 5.03 will be provided from lift 1 and an adjacent stairwell.
- Access to units 5.04 – 5.07 will be provided from lift 2 and an adjacent stairwell.

Floor Level 6

- 4 self care units comprised of:
  - 3 x 2 bedroom.
- Private balconies will be provided for all units.
- Access to unit 6.01 will be provided from lift 1 and an adjacent stairwell.
- Access to units 6.02 & 6.03 will be provided from lift 2 and an adjacent stairwell.

South East Photo Montage



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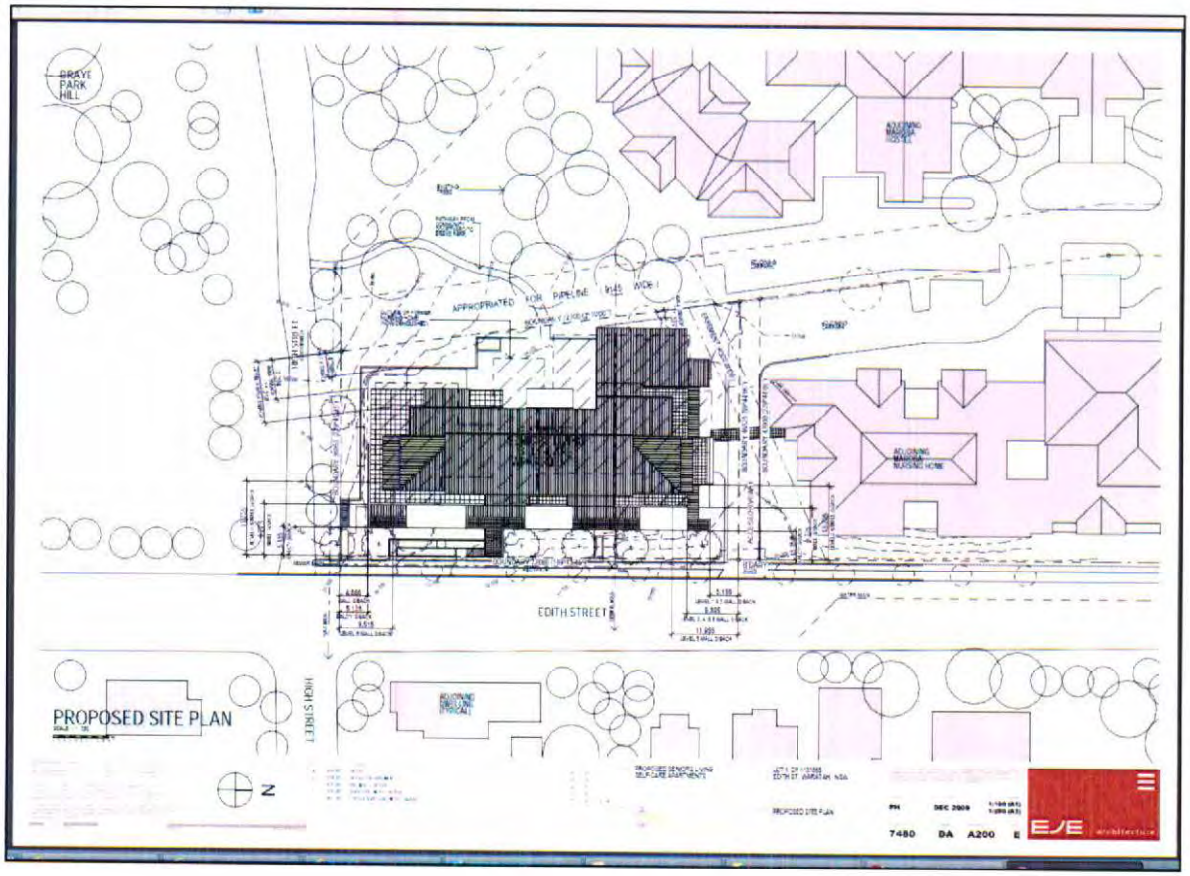

Proposed Site Plan

2.1 KEY FEATURES OF THE PROPOSAL

The development proposal at Maroba includes the following key features:

- 47 Independent Living Units (ILU);
- Integrated access to low and high care facilities;
- Access to community and health services;
- Scheduled and programmed health care services;
- Flexible and robust building form to provide for long term adaptability;
- High levels of finish and treatment to reduce maintenance and facilitate cleaning and serviceability; and
- High levels of amenity and comfort.

The location of the 47 ILU within the wider Maroba complex provides the following benefits to residents:

- Ability to progress over time from an independent care facility to a low care facility and then a high care facility, on the same site;
- Ability for partners with different care levels to be accommodated within easy and close proximity;
- Ability to access high level specialist medical and emergency care from the neighbouring Mater Hospital; and
- Ability to access on-site visits by a wide range of medical practitioners.

3.0 THE HOME, THE IMPORTANCE OF ACCOMMODATION FOR THE AGED & AGEING

The home has special significance for older people. This fact is highlighted in the results of a study undertaken for a Ministerial Advisory Council on Housing[1] in order to understand the importance of housing and neighbourhood in coming to terms with ageing and frailty in old age. Home is a familiar place, in a familiar location, where older people know others and feel in control of their lives. Other studies examining older people's preferences for housing have found that the majority wish to stay in their home, or if they had to move, to move once and at least remain within their current suburb, in a familiar social environment.[2]

The health and well being of older people is intrinsically linked to housing and can be influenced by many factors including, the type of housing tenure, the location of the home in relation to neighbours and access to services, the design of the home, the ability to maintain it and the level of financial resources.[3] This is supported by extensive qualitative research that has identified direct links between unmet housing needs and poor health[4].

The current Federal Government policy of "ageing-in-place", which (among other objectives) encourages older people to remain living independently in their own home and aims to prevent premature admission to residential care, is dependent upon the appropriateness of housing arrangements and the availability of the support services needed. However, as many observers argue, the objectives of this policy are not being met due to a lack of choice in available housing options, difficulties in accessing support services and the limited linking of housing with other services[5]

The appropriateness of housing in meeting the needs of people as they grow older consequently involves a range of issues including, affordability, vocational proximity to services, amenities and networks, as well as housing design and facilities in the home that can be adapted to meet the changing physical needs of people as they age.[6]

Maroba and the proposed addition of 47 Independent Living Units (ILU) is a local attempt to address the needs of seniors living in a very directed and targeted manner. It allows for people to age in their homes, in the confidence and comfort provided by a managed and supported

---

1 Davison, H Kendig, F Stephens, and V Merrill, It's my place: older people talk about their homes, Australian Government Publishing Service, Canberra, 1993.
2 M.A. Groves and V.F. Wilson, .To move or not to move? Factors influencing the housing choice of elderly persons,. Journal of Housing for the Elderly 10, 1992
3 Lesley Guster, .Housing Options for Older People: A Discussion Paper,. prepared for The Older Persons Housing Advisory Network (OPHAN) and Shelter SA, November 2002, p.4.
4 see Dr Peter Phibbs, .The Social and Economic Impacts of Unmet Housing Needs,. Queensland Government Department of Housing, Occasional Paper 4, p.6.
5 Guster, above note 3.
6 Bruce Judd, Kay Kavanagh, Alan Morris and Yuvisthi Naidoo, "Housing Options and Independent Living: Sustainable Outcomes for Older People who are Homeless" for the Australian Housing and Urban Research Institute (AHURI), University of NSW-University Western Sydney Research Centre, August 2003, p.12

community, with the ability to progress to higher levels of care as time and need dictate. Maroba provides this in a location which is central to the wider Newcastle community so that people from a range of inner and middle ring suburbs feel comfortable and familiar with the location.

4.0 Policy Context

How to plan for, manage, and best serve the ageing and aged members of our community is an important issue, and has justly warranted the significant attention of all levels of government in Australia. The proposal to develop 47 ILU at Maroba must be considered in the context of this policy environment.

4.1 NEWCASTLE CITY COUNCIL PLANNING AND POLICY CONTEXT

Newcastle City Council policies support the provision of ILU as proposed at Maroba. In 2007 Newcastle Council adopted the ***Senior Novocastrian Policy***. This Policy remains current and there is an encumbrance on Council to consider it in making decisions that relate to Senior Novocastrians. "This policy recognizes the importance of a planned corporate approach to the expanding numbers and the diverse capacity of future seniors. The undertakings identified in the policy establish a set of principles to guide Council and support increased cooperation and collaboration across Council to address the emerging needs of seniors."[7] The report supporting the adoption of this policy says that "The adoption of the amended Senior Novocastrian Policy would acknowledge community comment, support Council in identifying and prioritizing issues of concern to senior Novocastrians, guide the development of strategies to address these in future management plans and would differentiate Council's response to an ageing population from other levels of government and community organisations." [8]

The Policy states Council will:

1. Ensure **equitable access for seniors to Council services**, facilities, activities and events.
2. **Promote opportunities for seniors to maintain independence**, mobility and well being.
3. **Advocate for the provision of a range of housing** and transport options suitable for seniors.
4. Maximise opportunities for multi-cultural, inter-generational living.
5. Encourage seniors to actively participate in paid and unpaid work and community life.
6. Promote lifelong learning for seniors to enable them to engage in continuing education.
7. **Facilitate community and government working together** to provide coordinated support services for seniors.
8. Develop processes that will **enhance the capacity of seniors to engage in planning**, decision making and community action.

Many of the policy directions, identified for reference by number above, go directly to support the proposed development at Maroba. To argue against the proposed development of 47 ILU at Maroba without a wider consideration of items 1, 2 and 3 would be in direct contradiction of Council's own policy. Any consideration of the proposed development must be done so in the context of Council's own policy which promotes access to services and facilities, opportunities to maintain independence and the provision of a range of housing types for seniors. Item 7 states that council will facilitate the community and government working together. This commitment

7 Mackenzie/Clarke Senior Novocastrian Policy, 19 June 2007, ordinary Council Meeting, item 18.
8 Ibid.

should be considered when assessing the capacity of the planning framework to accommodate non conforming development with a strong social justification. Similarly, Item 8 indicates that Council will support the ability of seniors to engage in decision making. Therefore, any decision in regard to Maroba must take into account the input of the hundreds of people on the waiting list for the facility.

The need, and indeed desirability, of compact, well located and well serviced seniors ILU is supported at the highest level in Council's ***Newcastle 2030 Community Strategic Plan***. The Plan identifies the ageing of the population as a key challenge facing the city, along with the need to efficiently and affordably accommodate new growth. How better to achieve both these agendas than by freeing up housing for young families in established suburbs while providing more age appropriate and suitable compact living for the aged and ageing in new purpose built facilities.

The Plan continues to articulate Council's commitment to environmental sustainability: to reduce or at least contain our carbon footprint, to better utilize scarce resources and to become more connected and accessible for pedestrians and for public transport users. While the development at Maroba exceeds the provisions established in the DCP and the new LEP for residential accommodation, Council's other agendas of social and environmental sustainability should also be considered. The planning framework did not conceive the level of demand for seniors housing or the range of issues and impacts development outside the standard provisions might generate. A wider view of the social benefits is worthy of consideration. The social benefits include accommodation of people who are planning for their old age in a convenient, well serviced and connected location at densities above the norm, the freeing up of housing in existing suburbs thereby reducing the demand for fringe expansion, and minimisation of the impact on the city's urban foot print.

The land/site area for the 47 units is approximately 3,005m^2. This is the equivalent of 64m^2 per dwelling. Once these units are constructed there will be some 47 existing suburban dwellings available for sale to younger families. These are families who alternatively may have purchased homes in new residential subdivisions on the city's fringe. Typically new dwelling lots are on average 600m^2 and another 600m^2 is required for roads, open spaces and other servicing (i.e. standard ration of 8 lots per hectare). This means that potentially another 5.6ha on the city fringe would need to be converted to housing to accommodate these families. The evidence shows that without planned aged accommodation options seniors stay in their homes despite the often inappropriateness of that option for them and for the wider community.

The proposal to provide 47 ILU at Maroba should also be seen in the context of Council's built environment objectives and strategies. Council's 2030 Community Plan explicitly states two strategies which, if considered in the decision making in regard to Maroba, would be highly influential. These sit under Objective 5.3 *Greater diversity of quality housing for current and future community needs*. Strategy 5.3a states "Provide a mixture of housing types that allow residents to meet their housing needs at different stages of their lifecycle within the city" and 5.3b states "Ensure new residential development is well designed for people with a disability or limited

mobility, the elderly and is adaptable for use by different household types".[9] If council is serious about these strategies it is required to at least consider the wider social and community outcomes of a project such as Maroba and determine whether it is appropriate on the basis of the significant advantages the project brings, including improved housing choice, diversity and affordability in any decision making matrix.

The ***Newcastle 2030 Community Plan*** goes on to focus in section 5 on the desired form of urban development for the city and states in strategy 5.2a that Council should "Plan for concentrated growth of housing around transport and activity nodes, where there are appropriate services". Further, 5.2c it states that Council should aim to "Cluster facilities with shops, school and other activity centres to create community focal points and promote safety".[10] The model being implemented in the existing and proposed Maroba proposal is built on these same strategies: clustering supportive and synergistic activities, and building clusters of a scale that provide diversity of services and safety, and ensure residents have good public and pedestrian access to services, amenities and facilities. To significantly reduce density on this site would be to contradict these principles and strategies.

Council also has urban planning policy documents that relate to specific locations. In this regard the ***Newcastle Urban Strategy*** [11] specifically identifies the planning objectives for the Waratah area. It states that Council should "Encourage development which is capable of catering for additional population, particularly for older persons and students." In terms of this objective the development of 47 ILU at Maroba deliver on both the accommodation of additional population and housing for older persons.

The ***2030 Community Plan***, while not a statutory planning instrument like an LEP, is a fundamental and significant frame of reference for this project. The document itself, was widely communicated, exhibited and developed via community input, and subsequently endorsed by Council. It states in strategy 7.1c that Council will "Integrate Newcastle 2030 principles, objectives and strategies in the City of Newcastle corporate planning framework". Furthermore, this is the most comprehensive, up-to-date, and community based document produced by Council. Any argument that the 2011 Draft LEP and its provisions which apply to the site reflect more recent community values and expectations for the site are fallacious. The 2011 Draft LEP is a response, not to a comprehensive planning investigation and consultation, but to the direction of the NSW government to bring the city wide LEP into the standard and template form. Indeed the aim was not to substantially change zones and provisions as part of the exercise.

The Newcastle 2030 Community Plan recognizes the importance of community input and engagement and states in strategy 7.2 that it should "provide opportunities for genuine and

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9 http://www.newcastle.nsw.gov.au/__data/assets/pdf_file/0007/146554/Newcastle_2030_Publication_final_web.pdf. page 58.

10 Ibid

11 http://www.newcastle.nsw.gov.au/__data/assets/pdf_file/0015/116421/Newcastle_Urban_Strategy_Update_2009_web_version.pdf page 20.

representative community engagement in local decision making." In regard to Maroba, this process of consultation and engagement has been thorough. The process included:

- Consideration and evaluation by the Council's Urban Design Consultative Group which supported the proposal.

- Advertising and exhibition of the project for public consideration and comment. The exhibition attracted 73 letters of support, one letter of conditional support and one letter in objection.

- Posting of details of the proposal on the Maroba web site and in other communications material which resulted in the establishment of a waiting list specifically for these units of 157 individual and couples.

If Council is committed to this strategy, and its policy of open and inclusive community engagement, then there is a valid expectation that the views of the local community in this regard will be taken into consideration. While certainly not the only consideration, it is valid grounds for Council to determine that the provision of a DCP can be exceeded if community support and benefit justify that exceedance. This is most certainly the experience with determinations by the Minister, the Planning Assessment Commission and in case law on this matter across NSW as will be demonstrated in **section 4.3** of this report.

4.2 STATE PLANNING CONTEXT

The most significant state planning policy in regard to the Maroba development proposal is **State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004,** current version for 29 July 2011 to date. The aims of the policy are as follows:

(1) This Policy aims to encourage the provision of housing (including residential care facilities) that will:

> *(a) increase the supply and diversity of residences that meet the needs of seniors or people with a disability, and*
>
> *(b) make efficient use of existing infrastructure and services, and*
>
> *(c) be of good design.*

(2) These aims will be achieved by:

> *(a) setting aside local planning controls that would prevent the development of housing for seniors or people with a disability that meets the development criteria and standards specified in this Policy, and*
>
> *(b) setting out design principles that should be followed to achieve built form that responds to the characteristics of its site and form, and*

(c) ensuring that applicants provide support services for seniors or people with a disability for developments on land adjoining land zoned primarily for urban purposes.

This state policy was designed exactly for projects such as Maroba Independent Living Units as is indicated in **Table** 1 below:

Table 1: Maroba's responses to aims of SEPP (Housing for Seniors or People with a Disability) 2004

SEPP AIM	RESPONSE
(a) increase the supply and diversity of residences that meet the needs of seniors or people with a disability, and	The project provides 47 new independent living units which are affordable and designed specifically to meet the needs of seniors in the Newcastle community
(b) make efficient use of existing infrastructure and services, and	The project efficiently utilises and has easy access to existing public and private infrastructure including access to public transport, the Mater Hospital, on site geriatric health services , neighbourhood retail facilities, clubs and sporting groups
(c) be of good design.	The project has the support of the urban design advisory panel, future purchasers and there has only been one resident objection.

The SEPP calls for the setting aside of regular planning provisions and the focused and specific assessment of the project on the basis of good urban design, design suited to seniors, and access to support services. The Maroba proposal meets these criteria.

Further "the policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes". The subject site is zoned for residential use, and as such the policy is applicable to the site and proposal. The Policy specifies that seniors are any of the following:

"*(a) people aged 55 or more years,*

(b) people who are resident at a facility at which residential care (within the meaning of the Aged Care Act 1997 of the Commonwealth) is provided,

(c) people who have been assessed as being eligible to occupy housing for aged persons provided by a social housing provider."

And that Seniors housing is residential accommodation that is, or is intended to be, used permanently for seniors or people with a disability consisting of:

"(a) a residential care facility, or

(b) a hostel, or

(c) a group of self-contained dwellings, or

(d) a combination of these,

but does not include a hospital."

In summary what this charter does is allow the development of the proposed 47 units at Maroba despite the provisions of any other environmental planning instrument if is carried out in accordance with this Policy and if there is reasonable social benefit. In the Department's guidelines for the implementation of this SEPP it states that while there are no mandated standards for retirement villages, the "ideal village" is "one offering 3 levels of care in different types of accommodation: self–contained dwellings, and residential care facilities (low and high care)". It further recognises the advantage of co-located care facilities, allowing the operator to cross subsidise the construction of facilities and offer a higher level of lifelong, in-place care. [12] The Policy guidelines go on to indicate where seniors housing should be developed. **Table 2** makes a check on the location of Maroba against the criteria set out in the guidelines.

Table 2: Maroba Units performance against SEPP Seniors Living design guidelines.

POLICY STATES THAT HOUSING SHOULD BE ACCESSIBLE TO	HOW THE 47 NEW UNITS AT MAROBA MEASURE UP
Shops, as a pedestrian or by public transport, within 400m	The nearest shopping village is Waratah Village which is 1 kilometre from the village and accessible by bus from the stop 200m from the village. Other centres also accessible by bus from this stop include: Georgetown shops, Wallsend, Stockland Mall at Jesmond, Mayfield shopping, West End shopping centre and commercial centre and the Newcastle city centre
Recreational facilities, as a pedestrian or by public transport, within 400m	The 104 bus can take residents to bowls, tennis clubs, Mayfield East RSL, as well as the fish co op and marina at Honeysuckle..
Community facilities, as a pedestrian or by public transport, within 400m	The 104 bus also takes residents to Newcastle University, and the 226 bus can take them to Council's new Wallsend library.
General medical practitioners, as a pedestrian or by public	GP's and medical specialist visit the facility on a regular basis. These, and more specialised services,

12 http://www.planning.nsw.gov.au/settingthedirection/pdf/seniorsguide_may04.pdf. page 11.

POLICY STATES THAT HOUSING SHOULD BE ACCESSIBLE TO	HOW THE 47 NEW UNITS AT MAROBA MEASURE UP
transport, within 400m	will be accessible to the residents of the proposed units. The nearest public hospital is the Mater Misericordiae which is 200m from the village.
Public transport	From the bus stop, some 200m from the village entrance, public buses are available to take residents to a wide variety of locations. Appendix A shows the two most convenient bus routes available from the village and Mater bus stops. This bus also delivers residents to both Waratah and Newcastle Station from where they can access the Hunter valley and Sydney services.
Accessible	The proposed development meets all design standards in terms of wheel chair access, security, access to letterboxes, car parking and entries, as well as ease of 'finding your way around", room size bathroom, bedroom and kitchen features.
Adaptable	The proposed design of the ILU is such that that the internal walls of the units are non-load bearing and can be relocated to accommodate other styles of accommodation or indeed other longer term uses.
Affordable	The location of the new units on the existing site affords greater affordability at the initial purchase stage and well as in terms on ongoing resident living costs.

4.3 RELEVANT CASES AND EXPERIENCE

Relevant cases in the Land and Environment court, the decisions made by the Minister under Part 3A and the findings of the Planning Assessment Commission are most often in support of applications for seniors living facilities under SEPP (Housing for Seniors or People with a Disability) 2004, when the proposed development exceeds council planning provisions for height and density and when they do not conform to the permissible uses in a zone. Some of these cases bare direct relevance to this project and demonstrate overwhelmingly that at state planning and legal levels the determination has most often come down to community and social benefit.

The first example is Sir Moses Montefiore Jewish Home in a determination under Part 3A by the Minister for Planning. The Minister found in favour of the project on the basis of a recommendation of the Director General on 28th June 2011. Randwick Council made submissions objecting to the project including:

- Breaches in density and height are at the upper limit that the site can tolerate relative to the existing and future character of the surrounding area.
- The proposal is an over development of the site.

- Impact on surrounding residential amenity from intensification of use such as additional staff and related car parking and traffic.

- Transport and accessibility.

Despite these criticisms the Department assessed the proposal and found that having "assessed the merits of the proposal it is considered that the impacts can be suitably mitigated and/or managed to ensure a satisfactory level of environmental performance, pursuant to Section 75J of the Act. The Department considers that the proposed development is an appropriate site specific response to the increased demand for aged care places in existing built up areas of inner Sydney. This demand is recognised by the Seniors Living SEPP and the Draft East Subregional Strategy which identifies a significant need within the area to provide different housing forms to promote 'ageing in place'.

The Department has considered the proposal within the context of the established need for this form of development with its associated public benefits through various levels of aged care including self-care to high level dementia care services in the proposed facility. Ultimately the Department considers that this proposal provides a socially desirable outcome."[13]

Another case which demonstrates that social benefit can be applied to overrule existing planning controls is found in the Planning and Assessment Commission's report 20/1/2011 in relation to the application for housing under SEPP Seniors Living at the Cardinal Freeman Village, at 137 Victoria Street Ashfield Sydney.

The Commission's Comments are below:

"Following the Commission members' examination of the documents and plans provided by the Department, the Commission noted that the development will increase the overall building heights on the site compared to existing conditions. However, the Commission considers the site location and topography lends itself to this level of development. The development will also assist in improving housing choice to enable the existing community to 'age-in-place', which is a requirement of the draft Inner West Sub-Regional Strategy".

In the case of the Benevolent Society v Waverley Council (file 10848 of 2009) the NSW Land and Environment Court also found in favour of the social benefits of aged care accommodation over the need to maintain existing planning provisions. The proposal involved the demolition of existing structures, the construction of a series of accommodation blocks including a ten storey building and the provision of 140 self care units. The project was situated in an existing residential area of high amenity and significant heritage elements. Further, the proposal was inconsistent with elements of the LEP (permitted uses) and the DCP (height and FSR). The court recognized the validity of SEPP Seniors Living in such cases (clause 34). The court heard a range of "uncontradicted evidence in support of the proposal not merely from a range of persons who are

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13 https://majorprojects.affinitylive.com/public/c236aa8143f9a0f3d42e22e5d5df4713/Director%20General's%20Environmental%20Assessment%20Report.pdf, page 29.

potential future occupants of the premises, a group of persons to might be regarded as giving evidence purely in their own self-interest, but also from a number of persons who have considerable professional expertise in aged care and medical or social issues associated with an ageing population. This evidence was given by:

- Professor G A Broe, Professor of Geriatric Medicine;
- Professor H Kendig, Research Professor of Ageing and Health;
- Ms G McFee, Director of UnitingCare Ageing NSW/ACT; and
- Ms A Collings, Director, St Vincent's Hospital Community Health Service.

(Clause 60) This evidence supported the broad proposition that the Society's "Apartments for Life", ageing in place life strategy for more elderly citizens was desirable not only for the occupants but, as I understood the evidence, on an economic as well as social cost efficiency basis."[14]

The "Apartments for Life Model" was adapted from the Dutch model developed and espoused by Hans Becker. Becker says "Before it was like this: a person would live in their own house until they became a little ill and they would move into [hostel-type] care and then if they became ill again, they would enter a nursing home. Now you don't have to move. Under this model, you can stay within the same apartment – even with physical handicaps as you get older." [15] While not referred to as "apartments for life units" the base model upon which the Maroba complex is built and managed reflects this international supported model.

The judgment goes on to say that (61) "The evidence given about the social desirability of and local community demand for such accommodation is relevant material for my consideration as it falls within matters arising from the broad public interest (see *Terrace Tower Holdings Pty Limited v Sutherland Shire Council* [2003] NSWCA 289; (2003) 129 LGERA 195)".

Clause 102 of the judgments provides further reinforcement of the need to consider social benefit and demand. "Indeed, the positive social benefits of a proposal such as this are, in my opinion, appropriate to be taken into account – as doing so it is entirely consistent with the decision of the High Court in *Kentucky Fried Chicken Pty Limited v Gantidis* [1979] HCA 20; (1979) 140 CLR 675. Although this case is most frequently prayed in aid where there are said to be adverse social impacts of a proposed development, it seems to me that a positive social benefit being taken into account is merely the flipside of the High Court's decision on the legitimacy of social impacts being proper planning considerations."[16]

14
http://www.lawlink.nsw.gov.au/lecjudgments/2010nswlec.nsf/19eb930e64c0733bca257363001d0a87/3431 6f1bf070268eca257703000db6e0?OpenDocument

[15] http://www.australianageingagenda.com.au/2008/06/23/article/Apartments-for-Life-in Aus/UDQONOCLHI.html

16 Ibid clause 102.

Senior Commissioner Tim Moore ruled that the development be approved with some minor amendments and he made clear this ruling was based very fundamentally on the social benefit, community demand and state policy goals achieved by the project.

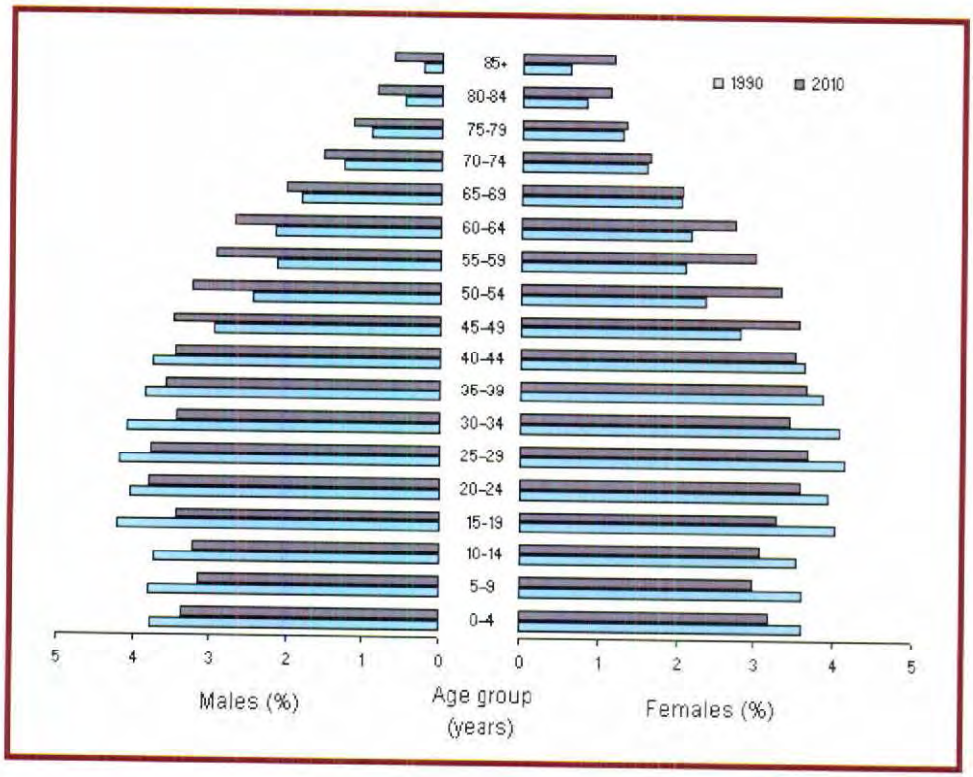
The weight of evidence suggests that if this matter were to go to court or to the Department of Planning and the Minister for consideration that it would very likely be approved.

5.0 Demand Evidence

Social benefit is most often derived when both a personal need is satisfied and broader benefits to the community are delivered. The underlying basis of benefit is demand. This section investigates and reveals the significant level of demand for aged accommodation at a national, regional and project level.

5.1 THE NATIONAL LEVEL DEMAND

Between 30 June 1990 and 30 June 2010, the proportion of Australia's population aged 15-64 years has remained relatively stable, increasing from 66.9% to 67.5% of the total population. The proportion of people aged 65 years and over has increased from 11.1% to 13.6%. During the same period, the proportion of population aged 85 years and over has more than doubled from 0.9% of the population at 30 June 1990 to 1.8% of the total population at 30 June 2010. The proportion aged under 15 years decreased from 22.0% to 18.9%.[17]



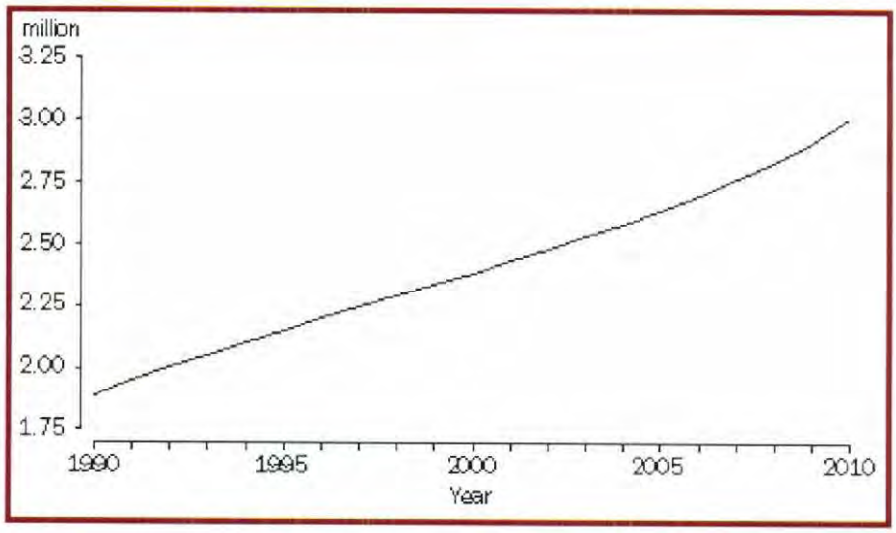
Source: ABS 3201.1

Figure 1: POPULATION STRUCTURE, Age and sex - Australia – 1990 and 2010.

[17] Australian Bureau of Statistics, 3201.0 - Population by Age and Sex, Australian States and Territories, Jun 2010, updated 2 December 2010.

In the year ended 30 June 2010, there were 292,000 young people aged 15 who entered the working age population while 204,600 people turned 65 years and left the working age population.

In the 12 months to 30 June 2010, the number of people aged 65 years and over in Australia increased by 94,800 people, representing a 3.3% increase. The proportion of the population aged 65 years and over increased from 11.1% to 13.5% between 30 June 1990 and 30 June 2010.



Source: ABS 3201.1

Figure 2: Population Aged 65 years and Over (1990-2010).

In the 12 months to 30 June 2010, the number of people aged 85 years and over increased by 23,100 people (6.1%) to reach 398,200. Over the past two decades, the number of elderly people increased by 170.6%, compared with a total population growth of 30.9% over the same period. There were almost twice as many females (260,200) than males (138,100) in this age group at 30 June 2010.

In the year ended 30 June 2010, the second largest increase in the number of people aged 85 years and over occurred in New South Wales (6.3%). In the 12 months to 30 June 2010, the number of people aged 100 years and over increased by 580 people (18.2%) to reach 3,700. Over the past two decades, the number of centenarians increased by 185%, compared with a total population growth of 30.9% over the same period. There were more than three times as many females (2,900) than males (800) in this age group at 30 June 2010.

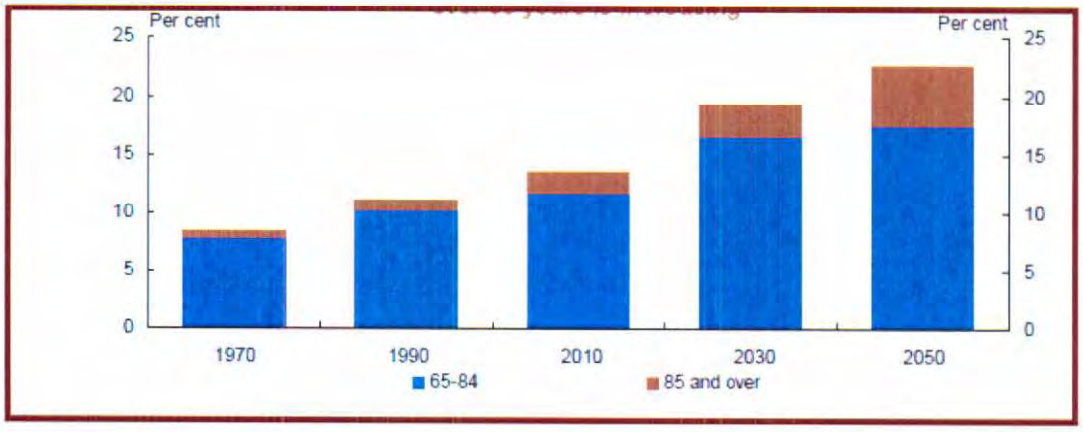
Population as at 30 June (millions of people)						
Age range	1970	2010	2020	2030	2040	2050
0-14	3.6	4.2	4.9	5.4	5.7	6.2
15-64	7.9	15.0	16.6	18.2	20.0	21.6
65-84	1.0	2.6	3.7	4.8	5.6	6.3
85 and over	0.1	0.4	0.5	0.8	1.3	1.8
Total	**12.5**	**22.2**	**25.7**	**29.2**	**32.6**	**35.9**
Percentage of total population						
0-14	28.8	19.1	19.0	18.3	17.4	17.2
15-64	62.8	67.4	64.7	62.4	61.3	60.2
65-84	7.8	11.7	14.3	16.6	17.2	17.6
85 and over	0.5	1.8	2.1	2.7	4.0	5.1

Source: 2010 Intergenerational Report, Treasury.

Figure 3: Australian's population history and projections (1970-2050).

In Australia, based on the latest Series B (moderate) population projections, the number of people aged 65 years and over is projected to exceed the number of children aged 0-14 years around the year 2025. This will be the culmination of a progression over the last 40 years. This progression is shown in the Federal Governments Intergenerational Report 2010 Figure 3.

The report also reveals the impact of ageing for the economic future of the nation. Figure 4 from the report shows the increasing percenge of people over 65 years of age and over 85 years of age within the population. The number of traditional working age people to support each retiree is expected to fall from 5 people today, to 2.7 people in 2049-50. In 1970, there were 7.5 working age people for each person aged over 65 years.



Source : http://www.treasury.gov.au/igr/igr2010/Overview/pdf/IGR_2010_Overview.pdf

Figure 4: The proportion of the population aged over 65 and over 85 years.

5.2 NEWCASTLE - LOCAL LEVEL DEMAND

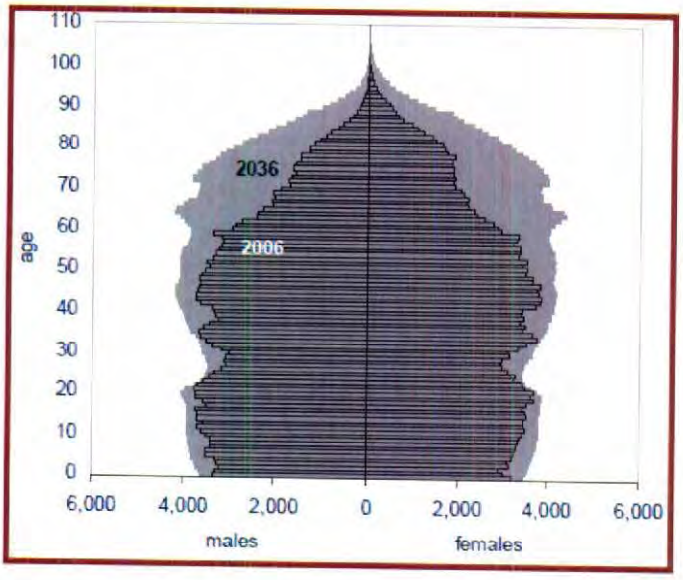
The ageing of the population seen at the national level and identified as an issue of national policy concern by the 2010 Intergenerational Report is also strongly evident at the regional and local levels. The data in this section is drawn from the Department of Planning, New South Wales State and Regional Population Projections, 2006-2036, the 2008 release.

For the Newcastle Statistical Subdivision the key results were as follows:

- The population of the Newcastle region is projected to grow to 676,000 by 2036, an increase of 31% on the 2006 population of 518,000.
- 34% of this growth will be driven by natural increase (births minus deaths) and 66% by net migration.
- Annual population growth is projected to be around 5,500 for the first 15 years of the projection, declining slowly thereafter to reach about 4,500 by 2035-36.
- The percentage of the population aged 65 and over is expected to rise from 15.2% in 2006 to 25.4% in 2036.
- Population growth rates are projected to be slightly lower than those of the State as a whole.

In the context of accommodating an ageing population the Newcastle Statistical district will have 25.4% of its population over 65 years as compared to the NSW figure 21.5% in 2036 and the Australian estimate of 21.2% in 2040. With an estimated 39,100 persons aged over 65 years of a total projected population of 177,700 people in the Newcastle LGA some 22% will be aged over 65 years. [18] Between 2006 and 2036 the Newcastle region is projected to experience population growth at all ages, with the greatest increase in numbers occurring in the older adult ages (Figure 5). Again the relatively larger number of women over 65 years is evident.

[18] NSW Statistical Local Area Projections, 2006-2036, page 155.



Source: 2006 data – ABS; 2036 Dept Planning forecasts

Figure 5: The age & sex profile of the Newcastle region's population in 2006 and 2036.

The New South Wales Household and Dwelling Projections, 2006–2036, also 2008 release, produced by the NSW Department of Planning demonstrates the impact of aging on the demand and need for housing stock. The number of **lone person households** in the Newcastle Statistical Subdivision "is projected to increase from 52,400 in 2006 to 84,700 by 2036, a rise of 32,300 households over the period, or 62%. The chance of someone being in a lone person household is greatest in the elderly ages. Growth in the number of this household type is in large part associated with the projected growth of the elderly population. The share of all households which are lone person households is projected to rise from 25% in 2006 to 29% by 2036".[19] This is represented in **Figure 6**.

[19] New South Wales Household and Dwelling Projections, 2006–2036: 2008 Release, page 11

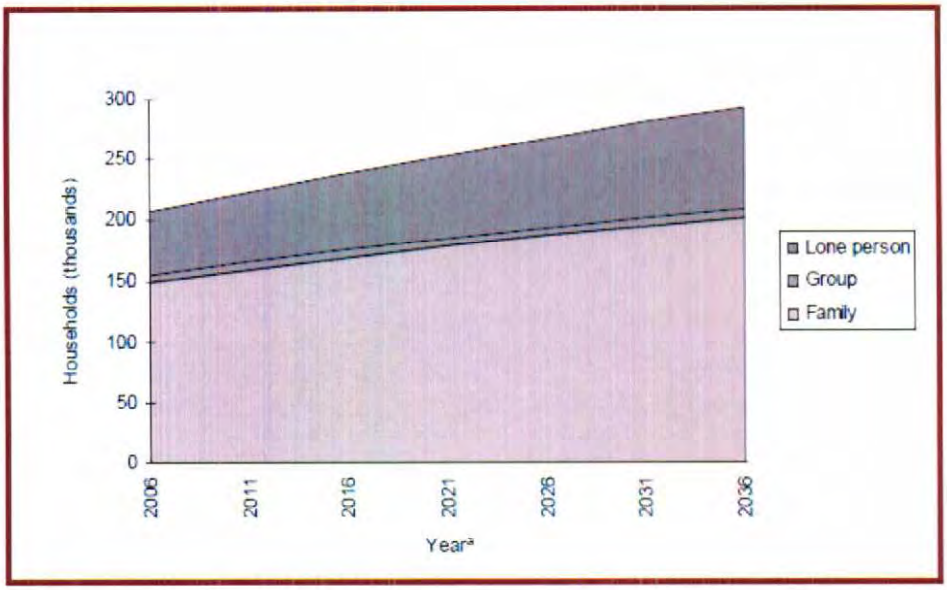


Figure 6: Projected number of households in the Newcastle region, 2006-36.

5.3 FACILITY BASED DEMAND - MAROBA

The demand for accommodation that is targeted and designed to suit the aged and ageing, is clearly demonstrated at the national, state and local level is more than evident in terms of the Maroba experience. The current waiting list (November 2nd, 2011) for any form of ILU at Maroba is 202. This includes both individual applications and applications for couples with the total number of people on the waiting list estimated to be 325. A wait list specifically for the "new units" has also been started and has 157 individuals and couples listed. This represents some 251 people. 78% of those listed have nominated the "new units' as their preference. With 47 units proposed this is three times the demand than the potential supply.

5.4 THE DRIVERS OF DEMAND

In addition to the absolute growth in the number of persons aged over 55, and the relative size of this demographic as demonstrated throughout **section 4** there are other social factors, both nationally and in the local context, that are driving demand.

- People are living longer and where once retirement was a short phase of life it is now increasingly a longer period of time. Importantly people know and are constantly reminded that they are living longer and will need levels of care beyond what their parents needed. This has driven a demand to be prepared and a desire to "get in on ground level" to ensure higher levels of care are available when needed. The decision to move to ILU is occurring earlier and is supported by social and government policy to age-in-place.

- Australia's population, like that of most developed countries, is ageing not just as a result of increasing life expectancy but also because of sustained low fertility. This is resulting in proportionally fewer children (under 15 years of age) in the population. The median age (the age at which half the population is older and half is younger) of the Australian

population has increased by 4.8 years over the last two decades, from 32.1 years at 30 June 1990 to 36.9 years at 30 June 2010.

- Policy directives, media and personal experience have supported the new expectation that people should, and want to, age-in-place. Increasingly this is not the place in which they raised their children, but in a new place designed for them (not a family) in the community where they are familiar and have contacts and relationships.

- The concept of downsizing dominates much of the decision making for this generation. This is particularly evident in Australia, which is characterised by a dominance of large detached house ownership. However, this concept is often misunderstood. It relates far less to the downsizing of the size of the home, as it does to the size of the yard, the features like pools and garages, and the level of cleaning and maintenance required. This means that there is strong demand for ILU with 2 and 3 bedrooms and large living areas but all with less maintenance and car parking required.

- The emerging market for ILU is the baby boomer generation. This demographic is the first age group not to have lived through the Great Depression and does not have the same sense of austerity as its predecessors. Bernard Salt posits "They are educated, opinionated and leisured people and they are very different to the people you have been dealing with up until now.....The baby boomers invented the transition into teenagehood and adolescence 40 years ago and it is likely that they will "re-engineer" retirement as well." [20] The expectations and experiences of this group will drive a whole new level of care for the aged and ageing.

The statistics at a local and national level indicate that there are far more women relative to men as people age: twice as many women as men over 65 years and three times as many women as men over 85 years. For this age group it is not untypical for the men in a partnership to have managed the financial, business and home maintenance responsibilities of the family. With the knowledge that most women will outlive their partners there is an added sense of necessity to move in to retirement living with the progression to care facilities while both partners are still well and able.

[20] http://www.australianageingagenda.com.au/2010/06/21/article/The-times-they-are-a-changing/WFKOUYGDUD.html, 21/06/10

6.0 Supply Constraints

When estimating the potential demand supply equation for ILU a recent study by Dr Anna Howe has recommended the adoption of a 3% medium demand model to be used as a starting point for determining more planned approach to the development of independent living units for seniors[21]. Many in the sector suggest a 4% model but the conservative approach is adopted for her analysis. **Table 3** shows local retirement villages self care units as benchmarked against the 3% of the population over the age of 60 years.

Table 3: Retirement villages self care units as benchmarked against the 3% of the population over the age of 60 years.

	OVER 60 YEAR POPULATION (ABS 2006)	NUMBER OF ILUS	DEMAND BASED ON 3% OF POP OVER 60 YEARS	DIFFERENCE
Newcastle	27,743	246	832	-586
Lake Macquarie	35,179	1,847	1,055	+792
Port Stephens	11,406	483	342	+141

Clearly there is a short fall of ILU in Newcastle relative to the demand in the order of almost 590 units. If the 2036 projection of 39,100 persons over the age of 65 is considered, the demand will rise to almost 1,200 ILU, increasing the short fall based on current stock to 927 ILU. This would require approval of approximately 50 ILU each and every year for the next 25 years.

Further, consideration beyond the numeric short fall is the apparent over supply in Lake Macquarie and Port Stephens LGAs and the reasons for this. Supply is also qualitative not just quantitative. Facilities that are distant from services and facilities, do not have immediate and fast access to medical facilities, are not located in "familiar and connected suburbs"", and do not facilitate visits or visiting by friends and family, are still accommodated and in demand. This demonstrates the severity of the supply situation and the environment which forces seniors to take accommodation outside their normal preferences. It appears that over supply in neighbouring LGAs is accommodating Newcastle residents because of the significant under supply within the local government area.

Supply data for the Newcastle and lower Hunter only serve to underscore the unmet demand for ILU in well located and serviced facilities such as Maroba. **Table 4** provides a current supply assessment for ILU in the Newcastle LGA. While new aged care facilities have been constructed,

[21] Retirement Accommodation and Residential Aged Care in the ACT 2006-2026 Demand and Supply Study: A Report prepared for the Chief Minister's Department of the ACT Government, 2006. Page 10.

none have incorporated ILU. Moreover, no other facility in the LGA offers three levels of care on one campus.

Table 4: Supply assessment within Newcastle LGA.

FACILITY	LOCATION	OPERATOR	ILU	LOW LEVEL CARE	HIGH LEVEL CARE
Annesley Court	Mayfield	Uniting care	21	none	none
St Luke's Terrace	Cooks Hill	Catholic care of the Aged	6		
Buchanan Court Village	Merewether	Anglican care	20	none	none
Denison Court	Hamilton	Uniting Care	32	none	none
Ephesus	Lambton	Catholic care of the Ages	8	none	none
Highfield Court	Mayfield	Living care	23		
Jenny Macleod	Wallsend	Arton Group	89	8	none
Maroba	Waratah	Islington Baptist Church	23	55	100
St Josephs' Village	Sandgate	Catholic Care of the Aged	18	none	none
Tours Terrace	Hamilton South	Catholic Care of the Aged	6		
			246		

7.0 DEMONSTRATING SOCIAL BENEFIT

It is clear that the proposal at Maroba for an additional 47 ILU as part of an integrated complex is consistent with local and state planning policy and the interpretation of those polices by the Department, the Minister and the court. This policy consistency is based on the overarching social benefits that projects such as this deliver to their residents, to the wider community and to government. Moreover, in the context of the ageing of the Australian population and the need to address issues of intergenerational equity, the demand for improved solutions and potential for these social benefits is only growing.

7.1 BENEFITS TO RESIDENTS

As discussed earlier the home has special significance for older Australians and there is too often a disconnect between what is required and desired in terms of a home to age in, and what people are forced to accept, and even tolerate.

Research and anecdotal evidence make it clear that the planned move to independent living, with the "built in" option to progress over time to low care and high care facilities, is not only the ideal model but what is being demanded by those in that decision making bracket. The key benefits to residents of well located, designed and serviced facilities, such as Maroba, include:

- The ability to remain in their community not be pushed to the unfamiliar fringe;
- Ease of access to facilities and services;
- Access to family and friends, both to visit and to be visited;
- The commitment to integrated and lifelong care and a progression from independent living to low and high level care facilities;
- The affordability of housing in a not for profit facility;
- The promise and reputation of quality accommodation, care and facilities;
- Mechanism to downsize thus improving quality of life, physical and mental health;
- The ability to take control of decision making at a stage in life when they are capable of doing so;
- The comfort and security of knowing that they can live in a managed, secure, supported and serviced community;
- The ability to access quality accommodation and amenities without the "stigma" of aged care;
- The comfort of knowing that if a partner should become in need of higher levels of care that this can be delivered in close on site proximity; and

- The ability to continue to mix with old friends and the ability to make new ones across a range of ages from 55 to 100 years of age.

Ageing-in-place promotes self-sufficiency, encourages cost-saving interdependence between friends and neighbours in the community, offsets social isolation, and does not involve costly professional support unless necessary. Rather than relocating individuals from their family home to a facility as they become frail, allowing them to age-in-place keeps valuable social networks. Late in life relocating can entail the loss of friendships, regular shopping and entertainment areas and familiar support personnel, resulting in a significant loss in the quality of life, personal control and dignity. Ageing in place allows all of these powerful networks to remain intact, providing both quantitative and qualitative benefits. A recent study completed by the Department of Health and Social Behaviour at Harvard University concluded that "compared with persons who had 5 or 6 social ties, those who had no social ties were at increased risk for cognitive decline after adjusting for a variety of socio-economic and physical factors".

7.2 BENEFITS TO COMMUNITY

Facilities such as the Maroba self care units deliver benefits not just to the residents of the facilities but to the wider community.

The reality is that often the houses of aged and ageing people, especially single women, suffer deterioration over time. Many seniors struggle to maintain a home that served them well while raising a family but in the latter half of their lives has become too big and expensive for one individual to maintain As cities struggle to increase and preserve their affordable housing stock, they cannot afford to let the older homes, often some of the most affordable, deteriorate. The deterioration of housing stock has a mental health impact on aged residents, but it also has a negative effect on communities more generally. Maintaining a home is much cheaper than rehabilitating it after it has suffered from a roof leak or plumbing problem over the course of time. When it comes to housing, preventive maintenance can save thousands of dollars in more substantial repair costs for the individual but of equal importance is that it can help protect a stock of affordable housing available to new families.

Section 4.1 provided some simple analysis of the potential benefit of freeing up 47 existing dwellings in existing suburbs for purchase by younger families. The benefits include the obviated cost of developing an additional 5.6ha of land on the city's fringe and the associated costs in terms of the environment, purchase price, and the provision of public services and infrastructure.

This effective use of public and private infrastructure is a significant benefit to government and the community. Existing suburbs are often well serviced and better serviced than new fringe suburbs. Residents have access to facilities such as libraries, parks, pools, community centres and clubs, retail and entertainment venues. The ability of higher density aged care facilities, located in existing suburbs, to use these facilities underpins their ongoing sustainability, and often enhances their commercial and operational efficiency. This premise underpins the notion of urban fill and increased density strategies adopted and supported by all levels of urban planning in government.

The provision of planned senior's accommodation can significantly help reduce the overall cost of providing health services to the aged and ageing. Ageing services are most expensive when they are delivered in an adhoc unplanned and dispersed manner across the community. The over care or under care resulting from this model can compound an existing health or housing service need, decreasing the quality of life and increasing the costs of care. Allowing individuals to age-in-place with calibrated support services offers a more efficient form of care, maximizing an individual's capacity for self-help and maintaining his or her economic and social contributions to a community.[22]

Often when older people live alone in their family home they tend to receive over care or most often under care. This is most likely to occur when an individual lives in substandard housing or is "over-housed," that is, he or she lives in a house that is much larger than necessary or manageable. Under care also occurs when, due to a lack of mobility or accessible transportation, an individual may not be receiving the proper level of care to maintain good health and prevent illness or catastrophe. By neglecting either the health or home of an individual, under care can incur unnecessary health and housing expenses.

Successful ageing-in-place programs minimize the provision of inappropriate care, and therefore the costs, by offering a range of flexible services and calibrating those services to fit the needs of the individual. Rather than a rigid service-delivery system, ageing-in-place strategies create both health-care and housing options that provide support at the margin of need as defined by an individual's personal desire and efforts to live independently. Ageing-in-place works best as part of a comprehensive and holistic approach to the support needs of an ageing individual and an ageing community. Planned integrated villages such as Maroba have the ability to deliver targeted and appropriate care and accommodation, thus reducing the overall health cost to the community.

The Maroba proposal to provide 47 ILU will also deliver environment and sustainability outcomes. Having 1 or 2 people living in large homes is an inefficient use of land and very often results in an over use on a per person basis of water and especially power. Older homes can be less efficient to heat and cool and are serviced by older less efficient appliances and equipment. The new units at Maroba have been designed to meet the most modern and stringent standards in terms of environmental sustainability.

The design aim has included:

- Lowering the ongoing environmental impact;
- Reducing energy use;
- Reducing waste use;
- Reducing waste to landfill;

[22] http://www.jchs.harvard.edu/publications/seniors/lawler_w01-13.pdf, page 12.

- Providing healthy and comfortable living and working spaces; and
- Improving and preserving site ecology.

Maroba is committed to environmentally sustainable practices in all their business operations. The new building has been designed in accordance with environmentally sustainable design principles including solar access, design for climate, cross ventilation, energy saving, water use minimisation, recycling and efficient waste management.

The expectation is that once seniors move from their suburban detached dwellings, these dwellings are purchased and renovated by younger families. This process protects the embedded energy in this housing stock and enhances its operational sustainability as renovations and improvements often include solar heating, insulation, energy saving appliances. The person to usage ratio is increased and the net benefit is less energy and water consumed.

7.3 EVIDENCE OF SUPPORT

Illana Halliday, CEO of Aged & Community Services Association of NSW & Act has provided a letter of support, this is attached at **Appendix B.** Illana identifies a strong case for the provision of Seniors Housing.

Appendix A

Bus Routes

Appendix B

Letters of Support

Aged & Community Services
Association of NSW & ACT
Incorporated

21 November 2011

Joint Regional Planning Panel

Dear Panel

Maroba Apartments Development Application

Over the next decade billions of dollars will be invested in new accommodation and support for older Australians, in NSW. The aged care sector is undergoing major reform and huge pressures for growth.

NSW provides more than 40% of the aged care services available in Australia. This is an important fact, as the Department of Health and Ageing has determined that Australia needs an additional 82,000 aged care beds by 2020. This represents around 32,800 additional beds in NSW, in the next eight years (roughly 80 new beds a week). The average cost of each bed is around $150,000. These figures represent a major investment in infrastructure over the next 8-10 years, and the demand is unlikely to be met. We need to also invest in many other forms of accommodation, to meet consumer expectations and to reduce the demand for nursing home beds.

Appropriate new infrastructure is needed urgently. Demand for services is rapidly outstripping supply. It appears to be impossible to provide sufficient new beds in the sector. We do not have the luxury of time to wait for new Local Environmental plans or rezonings to be done.

By 2050, over 3.5 million older Australians will need to access aged care services each year compared with over 1 million now. Older Australians want to stay in their own communities, close to their current support systems, friends and families. This means that they want to stay in accommodation that feels like their own home, and if they have to move, it should be close to their current homes. This development is providing a much needed option for accommodation in Newcastle, that is not a nursing home, and yet still provides the safety and security available in the best aged care facilities.

PO Box 3124 Rhodes NSW 2138 (Level 3, 9 Blaxland Road)
TEL 02 8754 0400 1800 424 770 **FAX** 02 9743 4556 **EMAIL** mail@agedservices.asn.au **WEB** www.agedservices.asn.au **ABN** 13 737 853 254

This development by Maroba is an urgently needed age-appropriate form of housing. It allows 'older people to age in place', providing on-site support for them as their level of need for support increases. It is an efficient form of affordable housing, linking in to the other facilities on site at Maroba. This will decrease demand on Council to provide services such as libraries, community centres, day activities, recreation and leisure, local shops and services such as hairdressers and corner shops.

The site is an exceptional example of integration, being part of a complex with 24 hour medical and nursing staff support available, links to the exiting hospitals, and proximity to public transport if the residents wish to go to the various venues available in Newcastle. (Although the facility will of course also operate its own transport if residents wish to use that.)

Maroba is a Not For Profit provider of services to the aged and frail. It has an exceptional record of environmentally sustainable development, built to a standard other providers envy. They build in features that make the facilities a pleasure for the residents to be in and a welcoming place for visitors. They provide for a normal social experience for people living, working or visiting the facility.

I commend this development to you as an exceptional development that meets an urgent demand. It is perfectly placed within the Maroba complex, provides units with wonderful utility for the residents, provides for parking and transport, has minimal visual impact given the topography of the site, and is strongly supported by the local community.

Yours sincerely

Illana Halliday
Chief Executive Officer

Aged & Community Services Association of NSW & ACT Incorporated

Corporate Supporters

Our valued ACS Corporate Supporters are entitled to a wide range of benefits:

- ACS website listing including the company profile, logo, website link and the opportunity to write feature stories
- Discounted sponsorship rates for ACS Afternoon Seminars
- Speaking opportunities at our Afternoon Seminars as a sponsor
- Your company's promotional material displayed in our Training Room
- Use of the ACS Corporate Supporter logo on your promotional material
- A subscription to the bi-monthly *ACS Update* magazine, fortnightly e-newsletter *Brief Update* and options to contribute articles
- Discounted advertising rates in *ACS Update*.

Industry Affiliations

ACS is affiliated with various industry bodies:

- ACS is part of the federation of State Associations that comprises Aged and Community Services Australia (ASCA) - the national peak body
- ACS is a Registered Industrial Organisation of Employers and can lobby on industrial matters on behalf of members at the Commonwealth and State level
- ACS is a Registered Training Organisation and operates within the requirements of the Australian Quality Training Framework. In 2009 ACS achieved re-registration from the NSW Vocational Education & Training Accreditation Board for a further five years.

Aged & Community Services Association of NSW & ACT Incorporated

Aged & Community Services Association of NSW & ACT Incorporated

ABN 13 737 853 254

PO Box 3124 Rhodes NSW 2138
(Level 3, 9 Blaxland Road)
T: (02) 8754 0400 or 1800 424 770
F: (02) 9743 4556

E: mail@agedservices.asn.au
W: www.agedservices.asn.au

06/2009

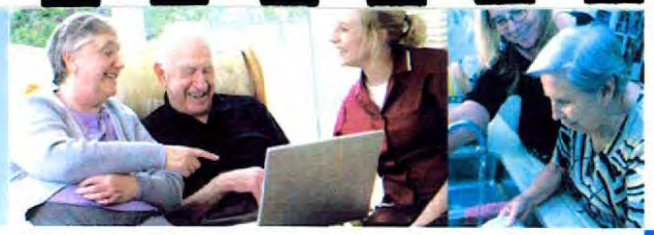
Aged & Community Services Association of NSW & ACT Incorporated

ACS

Industry Leadership
Member Services
Building Partnerships

Who we are

Aged & Community Services Association of NSW & ACT Incorporated



Aged & Community Services Association of NSW & ACT (ACS) is the leading peak organisation for not-for-profit retirement living, community and residential aged care providers.

ACS represents 300 organisations in NSW and the ACT providing over 1,700 services to more than 100,000 people. ACS Members range in size from large multi-site organisations to small rural and regional stand alone providers. ACS supports a regional network comprising 14 Regional Committees across the State and Territory.

Our vision

Achieving measurable improvements in the wellbeing of residents and clients of member organisations by influencing government policy, advising on good governance and providing quality education.

Our mission

Providing leadership to the aged and community care sector and empowering and supporting ACS member organisations to provide quality aged and community care services.

Member services and benefits

ACS Members receive the following:

- Lobbying of State, Territory and Federal Governments on policy improvements for retirement living, community and residential aged care providers
- Clinical and policy support
- Industrial and employee relations advice
- Nationally accredited courses at member rates
- Professional development through courses and conferences at member rates
- Latest information through the bi-monthly *ACS Update* magazine, fortnightly *Brief Update* e-newsletter, ACSA *National Report* e-newsletter and the ACS website
- Support through the regional network.

Members are entitled to vote and stand for the:

- ACS Board
- Advisory Committees
- Regional Committees.

Industry Advice Scheme

The Industry Advice Scheme (IAS) was established for those providers who are for-profit organisations. IAS providers receive the same services and benefits as Members except IAS providers cannot vote or sit on the ACS Board or Advisory Committees.

Additional fee based services

ACS Members and IAS participants can receive additional services on a fee for service basis.

1. **Employee relations services include:**

- Legal representation at Industrial Relations Commission or other relevant court or tribunal
- Preparation for and representation at Industrial Relations Commission or other relevant court or tribunal hearings beyond conciliation stage
- Negotiation of workplace enterprise agreements
- On-site services such as assistance with disciplinary, mediation or termination meetings.

2. **Consultancy services include facilitation and advice for:**

- Strategic planning
- Management structure and service review
- Mentoring key personnel
- Quality management systems including accreditation and Integrated Monitoring Framework
- NSW food safety standards
- ACFI funding review

3. **Members and IAS participants can profile their organisations and services on the ACS website.**

coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

CONTAMINATION ASSESSMENT MAROBA APARTMENTS, CNR EDITH AND HIGH STREETS, WARATAH NSW

EJE Architecture Pty Ltd

ENAUWARA04216AA-R01
11 November 2011

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SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

CONTAMINATION ASSESSMENT MAROBA APARTMENTS, CNR EDITH AND HIGH STREETS, WARATAH NSW

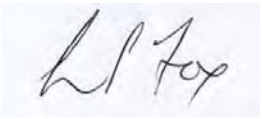
EJE Architecture Pty Ltd

ENAUWARA04216AA-R01
11 November 2011

Written/Submitted by:

Emma Coleman
Senior Environmental Scientist

Reviewed by:



Laurie Fox
Principal

Coffey Environments Australia Pty Ltd ABN 65 140 765 902
19 Warabrook Boulevard Warabrook NSW 2304 Australia

11 November 2011

EJE Architecture Pty Ltd
412 King Street
NEWCASTLE NSW 2300

Attention: Glen Spicer

Dear Glen

RE: CONTAMINATION ASSESSMENT
MAROBA APARTMENTS, CNR EDITH AND HIGH STREETS, WARATAH NSW

Coffey Environments Australia Pty Ltd (Coffey) is pleased to provide the report for the Contamination Assessment for the Maroba Apartments development.

This report should be read in conjunction with the attached "Important Information about your Coffey Environmental Report", which provides a general context for this type of environmental report.

We trust that the report meets with your current requirements. If you require further information, please do not hesitate to contact the undersigned on (02) 4016 2300.

For and on behalf of Coffey Environments Australia Pty Ltd

Emma Coleman

Senior Environmental Scientist

RECORD OF DISTRIBUTION

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LIST OF ATTACHMENTS

Important Information About Your Coffey Environmental Report

Tables

Table LR1: Soil Analytical Results

Figures

Figure 1: Site Locality Plan

Figure 2: Sampling Location Plan

Figure 3: Soil Contamination

Appendices

Appendix A: Site Photographs

Appendix B: Test Pit Logs

Appendix C: Laboratory Reports

Appendix D: Data Validation Report

ABBREVIATIONS

AHD	Australian Height Datum
C6-C36	Hydrocarbon chainlength fraction
Bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
COC	Chemical of Concern
ID	Identification
LOR	Limit of Reporting
mg/kg	milligrams per kilogram
NATA	National Association of Testing Authorities
NEHF	National Environmental Health Forum
NEPM	National Environment Protection Measure
NSW DEC	NSW Department of Environment and Conservation
NSW DECC	NSW Department of Environment and Climate Change
NSW DECCW	NSW Department of Environment, Climate Change and Water
NSW EPA	NSW Environment Protection Authority
NSW OEH	NSW Office of Environment and Heritage
OCP	Organochlorine Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percent Difference
TPH	Total Petroleum Hydrocarbon
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This report presents the findings of a Contamination Assessment undertaken by Coffey Environments Australia Pty Ltd (Coffey) for the proposed Maroba Apartments development at the corner of Edith Street and High Street, Waratah NSW (the site).

It is understood that seniors living apartments will be constructed on the site.

The objective of the work was to carry out further investigation to assess the extent and nature of fill material, and provide recommendations on site suitability, and remediation and/or management of contamination (if required).

In order to achieve the objectives, the following scope of work will be carried out:

- Excavation of eight test pits and collection of soil samples;
- Laboratory analysis of soil samples;
- Data assessment and reporting.

The field investigations have identified fill on the site at depths ranging from about 0.2m in the south-western part of the site, up to about 1.6m in the north-western part of the site. The fill mound on the eastern boundary appears to be about 2m in height and has an approximate volume of 360m^3.

Contamination, above the residential guidelines was identified in the fill material in TP4 (in the form of copper and lead), and TP5 (in the form of TPH C10-C36 and PAHs) at depths of 0.5m.

Potential asbestos containing material fragments were observed across the site, two of these were analysed for asbestos. One sample (A2) showed the presence of chrysotile and amosite asbestos, whilst the other sample (A3) showed no asbestos.

Due to the proposed basement car park, a suitable remediation option is to classify the waste and remove material to a licensed landfill. Following removal of the fill materials, the base of the excavation will be validated, and validation report prepared.

This report should be read in conjunction with the sheet “Important Information about your Coffey Environmental Report”, which is attached.

1 INTRODUCTION

1.1 General

This report presents the findings of a Contamination Assessment undertaken by Coffey Environments Australia Pty Ltd (Coffey) for the proposed Maroba Apartments development at the corner of Edith Street and High Street, Waratah NSW (refer to Figure 1 for site location).

It is understood that seniors living apartments will be constructed on the site.

Coffey previously carried out a geotechnical assessment of a larger area, which included the site in 2007 (reference GEOTSGTE20243AA-AB, dated 28 March 2007).

The geotechnical report (Coffey, 2007) was submitted to Newcastle City Council (Council) as part of a Development Application (DA) for the proposed apartments. Council response included a requirement to *"provide additional information, consistent with Council's DCP requirements, demonstrating an assessment of the extent and nature of the contamination present and providing remediation plans as necessary for Council to be 'satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out'".*

1.2 Objectives

The objective of the work was to carry out further investigation to assess the extent and nature of fill material, and provide recommendations on site suitability, and remediation and/or management of contamination (if required).

1.3 Scope of Work

In order to achieve the objectives, the following scope of work was carried out:

- Excavation of eight test pits and collection of samples of fill and natural soil;
- Laboratory analysis of soil samples for a suite of potential contaminants of concern;
- Data assessment and reporting.

2 PREVIOUS ASSESSMENTS BY COFFEY

Coffey previously carried out a geotechnical assessment for a larger property which included the site in 2007 (reference GEOTSGTE20243AA-AB, dated 28 March 2007).

As part of the geotechnical assessment, four boreholes (BH5 to BH8) were drilled on the site. The borehole logs are attached in Appendix A.

Two environmental samples were collected and analysed from boreholes BH5 (0.5-0.6m) and BH8 (0.3-0.4m) to assess contamination. The samples comprised Gravelly Sand fill, and were tested for metals (arsenic, cadmium, chromium, copper, lead , nickel, zinc and mercury) and polycyclic aromatic hydrocarbons (PAHs). The results are included in Table LR1.

The report indicated that concentrations of contaminants were below residential land use criteria. The report also noted that the extent and type of fill was not able to be assessed due to access constraints on the site, and recommended further assessment and/or waste classification of fill materials once buildings were removed or during earthworks.

Coffey also carried out a waste classification for ash and slag fill identified under a roadway following removal of the building (reference ENVIWARA0143AB-L01, 7 August 2008).

3 SITE LANDUSE AND DESCRIPTION

3.1 Site Location and Landuse

The site locality is shown in Figure 1. A site layout plan is presented in Figure 2. A summary of site identification is shown in Table 1.

TABLE 1: SUMMARY OF SITE IDENTIFICATION

STREET ADDRESS	Cnr Edith and High Streets, Waratah
AREA	3,008m^2
TITLE IDENTIFIERS	Lot 1 in DP 1131868
LOCAL GOVERNMENT AREA	Newcastle City Council
PARISH	Newcastle
COUNTY	Northumberland
GRID CO-ORDINATES (AUST. MAP GRID)	32° 54' 12" S 151° 43' 12" E
SURROUNDING LAND	The site is bounded by: • Maroba Apartments (seniors living) to the north; • Edith Street, followed by residential properties to the east; • High Street, followed by vacant land to the south; and • Vacant land which appears to be a garden area for the Maroba Nursing home to the west.

3.2 Topography and Drainage

The Wallsend 1:25,000 Topographic Map shows the site lies at an elevation range between 30m and 40m above Australian Height Datum (AHD). The site is located on the side slopes of a northeast facing hill that slopes down towards the north-east.

Surface water is considered to follow the site topogaphy, and flow to the northeast. Surface water would infiltrate into the site soils, and flow into the municipal stormwater system located on Edith Street. Water collected in the stormwater drains at the rear of the site is likely to eventually discharge into Throsby Creek, which is the inferred nearest body of water located approximately 1.8km to the east of the site.

3.3 Local Geology

Reference to the 1:100000 scale Newcastle Regional Coalfield Geology Map indicates that the site is underlain by the Waratah Sandstone belonging to the Newcastle Coal Measures of Middle Permian age. These rocks typically weather to clayey sands and sandy clays. Sandstone was observed to outcrop at the southern end of the site.

3.4 Hydrogeology and Groundwater Use

Based on observations of the site and nearby topography, the regional groundwater table beneath the site is estimated to be located at a depth of greater than 10m below ground surface (m bgs). Regional groundwater would be expected to flow east and eventually discharge to Throsby Creek.

Shallow discontinuous groundwater may occur following periods of heavy or prolonged rainfall. Perched groundwater was encountered during the geotechnical investigation in 2007 at depths ranging from 1.5m to 4.4m bgs.

4 SITE OBSERVATIONS

The following site observations were made during fieldwork on the 14 October 2011. Site photographs are attached in Appendix A.

- The site slopes from the southwest corner to the northeast corner, and an outcrop of weathered sandstone is visible along the western and southern boundaries in the southwest corner of the site (Photo 1);
- The site is currently fenced, vacant, and cleared of vegetation. A few trees and shrubs are present on the western, eastern and southern boundaries;
- A former access road is present on the eastern boundary of the site, with a bitumen pavement across the top, and a garden bed along the eastern boundary. This former road is now elevated about 2.0m above the surrounding site elevation. (see Photo 2);
- Fragments of broken tiles, plastic, bricks, concrete and cement sheeting were present across the site (Photo 5).

5 FIELD INVESTIGATIONS AND LABORATORY ANALYSIS

5.1 Soil Sampling

Field work for the investigation was undertaken on 14 October 2011 by a Coffey environmental scientist. Field investigations included:

- Excavation of eight test pits (TP1 to TP8) using an excavator to depths of between 0.2m and 2.5m. Samples were collected from the fill materials in each test pit, and at the top of the natural residual soils underlying the fill. ;
- Three potential asbestos containing material (PACM) fragments (A1 to A3) were collected from the site surface;
- One duplicate sample was collected during fieldwork for quality control purposes.

Samples were split into two sub-samples, with one sample placed in a 250ml laboratory supplied glass jar with Teflon lined lids and the second sample placed in a zip-lock plastic bag. Samples were stored in a chilled esky during fieldwork and transport to the laboratory.

Samples were collected directly from the excavator bucket using a clean pair of disposable nitrile gloves for each sample.

Fieldwork was carried out in the fulltime presence of the Coffey environmental scientist, who logged the subsurface conditions, collected samples, and marked the sampling locations on a plan.

The test pit logs are presented in Appendix B. Approximate sampling locations are shown on Figure 2.

5.2 Laboratory Analysis

Environmental soil samples were dispatched to SGS Australia Pty Ltd (SGS) on 17 October 2011 under chain of custody conditions for the following broad suite of analytes.

- Total petroleum hydrocarbons (TPH);
- Benzene, Toluene, Ethylbenzene and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAH);
- Metals (arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc);
- Organochlorine pesticides (OCP);
- Polychlorinated biphenyls (PCB); and
- As bestos.

6 INVESTIGATION CRITERIA

The investigation criteria for soil were established based on the following references:

- NSW DECC Guidelines for the NSW Auditor Scheme (Second Edition) (DEC, 2006);
- NSW DECC, Guidelines for Assessing Service Station Sites, *(NSW EPA, 1994*);
- National Environmental Protection Council (NEPC) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM) (NEPC, 1999).

DEC 2006 and NEPC 1999 present health based investigation levels for different land uses (e.g. industrial / commercial, residential, recreational etc.) as well as provisional phytotoxicity based investigation levels.

The proposed development for the site is senior living apartments. Therefore the health-based investigation levels for *residential with gardens and accessible soil (home grown produce contributing <10% fruit and vegetable intake; no poultry), including children's day-care centres, preschools, primary schools, townhouses, villas* (Column 1 of Appendix II in DEC 2006), and *provisional phytotoxicity-based investigation levels* (Column 5 of Appendix II in DEC 2006) have been adopted as the investigation levels.

DEC 2006 Guidelines do not provide threshold levels for volatile petroleum hydrocarbon compounds. NSW EPA 1994 Guidelines for Assessing Service Station Sites provide an indication of acceptable cleanup levels for petroleum hydrocarbons compounds at service station sites to be reused for sensitive land uses. For semi-volatile petroleum hydrocarbons (C16 – C35 and >C35) investigation levels are provided in the DEC 2006, however, these are based on the NEPC 1999 health-based criteria, which require the laboratory analysis to unequivocally differentiate between aromatic and aliphatic compounds. If this cannot be done, the C10 – C40 criteria in the service station guidelines should be applied.

On the advice of the NSW Department of Health, the NSW Office of Environment and Heritage (OEH) has advised NSW Site Auditors (Site Auditors Meeting 1 March 2000) that "no asbestos in the soil at the surface is permitted". Enhealth (2005) 'Guidelines for Asbestos in the Non-Occupational Environment', provides some guidance on assessing and managing asbestos in soil although does not provide a threshold concentration or investigation level for asbestos.

The NEPM (NEPC, 1999) is currently under revision, with a draft document provided for consultation. The draft NEPM guidelines are expected to be finalised in mid 2012. These guidelines provide criteria for asbestos assessments, similar to current guidelines used in Western Australia. Until these guidelines are finalised, NSW OEH have advised that they will not endorse them. The NSW OEH have advised NSW Site Auditors in 2006 to exercise their professional judgement when assessing whether a site is suitable for a specific use in the light of evidence that asbestos may be a contaminants of concern. For this investigation, we have adopted 'non detect' as the investigation criteria for asbestos.

The relevant soil investigation levels are summarised in Table LR1.

7 QUALITY ASSURANCE/QUALITY CONTROL

Fieldwork was carried out in general accordance with Coffey Environment's standard operating procedures.

The environmental samples were placed directly into laboratory supplied glass jars and kept in a chilled insulated container during fieldwork and transport to the laboratory. A clean pair of nitrile gloves was used to collect each sample. Samples were collected from the centre of the excavator bucket to prevent cross-contamination of samples.

One duplicate sample was collected and analysed (QC2) for sample TP3 0.1-0.2m. The results of the field duplicate analysis showed the relative percent differences (RPDs) below the control limit of 50%, with the exception of lead at 57%, and numerous PAH compounds at 108% to 140%. It is considered that the RPD for lead is due to sample heterogeneity, and the PAH compounds RPDs are due to concentrations being close to the detection limit.

The quality control sample results are provided in Table LR2.

Samples were received by SGS Australia within the recommended holding times.

The laboratory (SGS) conducted internal quality control using laboratory duplicates, spikes and method blanks. The results are shown with laboratory report sheets in Appendix C. Analytical methods used for the laboratory testing are also indicated on the laboratory report sheets. The results of laboratory quality control testing are within acceptable limits, with the exception of RPDs for TPH C15-C28 and PAH compounds which the laboratory stated failed due to sample heterogeneity.

A data validation report is presented in Appendix D.

Based on the above assessment it is considered that the field and laboratory methods for soil are appropriate and that the data obtained is usable and considered to reasonably represent the concentrations at the sampling points at the time of sampling.

8 RESULTS

8.1 Subsurface Conditions

The general subsurface profile encountered comprised fill overlying residual soil, overlying weathered sandstone. The subsurface profile is summarised in Table 2 below, and the test pit logs are presented in Appendix B.

TABLE 2: SUMMARY OF SUBSURFACE CONDITIONS

Material Description	Depth to Base of Material (m bgs)							
	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8
FILL: Gravelly SAND medium grained, brown-dark brown, broken tiles, occasional whole bricks	0.4	0.2	0.3	0.2	0.3	-	-	-
Fill: Sandy CLAY medium plasticity, dark brown, fine to medium grained sand, broken tiles, bricks, and concrete	-	-	-	-	1.6		0.3	1.4
FILL: Rusted steel fragments mixed with dark brown sand in test pit TP4, with some tiles, pottery and compacted slag	-	-	-	1.1	-	- -		-
FILL: Clayey Gravel in test pit TP5, dark grey, from depth of 0.3m to 1.0m	-	-	-	-	1.1		-	-
RESIDUAL SOIL: Sandy CLAY, CLAY, Clayey SAND, medium to high plasticity, pale orange-brown, pale to dark grey, fine grained sand	-	-	0.8	1.7	1.7	2.5	1.5	1.4
Weathered SANDSTONE (refusal)	0.4	0.2	0.8	1.7	-		-	-

Perched groundwater inflow was encountered in TP5 at 0.3m depth during excavation. No odours were or staining was noted during excavation of the test pits. A layer of metallic material was encountered in TP4 at 0.2 to 1.1m depth (refer Photograph 4)

8.2 Comparison of Results with Investigation levels

The soil laboratory results were assessed against the land use criteria described in Section 6 and listed in Table LR1. Concentrations were below the adopted criteria in each sample analysed, with the exception of the analytes shown in Table 3 below.

TABLE 3 – CONCENTRATIONS ABOVE THE ADOPTED CRITERIA

Sample ID	Contaminant
SP1-1 (TP8 1.0-1.1m)	Zinc (270mg/kg) over phytotoxicity criteria.
TP3 0.1-0.2m	Benzo(a)pyrene (1mg/kg) over residential land use.
TP4 0.4-0.5m	Arsenic (66mg/kg), cadmium (3.1mg/kg), nickel (160mg/kg), and zinc (2,800mg/kg) over phytotoxicity criteria. Copper (2,300mg/kg) and lead (3,100mg/kg) over residential land use criteria.
TP5 0.5-0.6m	Benzo(a)pyrene (100mg/kg) and total PAHs (1,700mg/kg) over residential land use criteria. TPH C10-C36 (3,600mg/kg) over residential land use criteria.
TP6 0.1-0.2m	Copper (170mg/kg) and zinc (480mg/kg) over phytotoxicity criteria.

The laboratory analytical certificates are presented in Appendix C.

9 DISCUSSION

The field investigations have identified fill on the site at depths ranging from about 0.2m in the south-western part of the site, up to about 1.6m in the north-western part of the site. The fill mound on the eastern boundary appears to be about 2m in height and has an approximate volume of 360m^3

Contamination, above the residential guidelines was identified in the fill material in TP4 (in the form of copper and lead), and TP5 (in the form of TPH C10-C36 and PAHs) at depths of 0.5m.

Potential asbestos containing material fragments were observed across the site, two of these were analysed for asbestos. One sample (A2) showed the presence of chrysotile and amosite asbestos, whilst the other sample (A3) showed no asbestos.

Due to the proposed basement car park, a suitable remediation option is to classify the waste and remove material to a licensed landfill. Following removal of the fill materials, the base of the excavation will be validated, and validation report prepared.

The advantage of using this method is that site will be suitable for use with no ongoing monitoring or conditions.

10 CONCLUSION

Based on the presence of asbestos containing material fragments across the surface of the site, and lead and copper contamination identified in fill materials in TP4 and TP5, the site is not currently suitable for the proposed use.

It is considered that the site can be made suitable for use as senior living apartments following removal of fill material (including contamination fill) to a licensed landfill and validation. A remediation action plan will need to be prepared by a suitably qualified contaminated land consultant.

This report should be read in conjunction with the sheet “Important Information about your Coffey Environmental Report”, which is attached.

11 LIMITATIONS

The findings within this report are the result of discreet/specific sampling methodologies used in accordance with normal practices and standards. To the best of our knowledge they represent a reasonable interpretation of the general conditions of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

It is the nature of contaminated site investigations that the degree of variability in site conditions cannot be known completely and no sampling and analysis program can eliminate all uncertainty concerning the condition of the site. Professional judgement must be exercised in the collection and interpretation of the data.

In conducting this review and preparing the report, current guidelines for assessment and management of contaminated land were followed. This work has been conducted in good faith in accordance with Coffey's understanding of the client's brief and general accepted practice for environmental consulting.

This report was prepared for EJE Architecture Pty Ltd with the objective of assessing the presence of contamination on the site for the Maroba Apartments development, and for Newcastle City Council to assess the development application. No warranty, expressed or implied, is made as to the information and professional advice included in this report. The report is not intended for other parties or other uses. Anyone using this document does so at their own risk and should satisfy themselves concerning the applicability of its application and where necessary should seek expert advice in relation to the particular situation.

This report does not cover hazardous building materials issues. Information within the report including test pit logs should not be used for geotechnical investigation purposes.

12 REFERENCES

Central Mapping Authority (1986) 1:25,000 Newcastle Topographic Map 9130-3-N. Second Edition.

Geological Survey of NSW (1966) 1:100,000 Newcastle Geological Series Sheet, No. 9130 First Edition.

NSW EPA (1995) Sampling Design Guidelines.

NSW OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites.

NSW EPA (1994) Guidelines for Assessing Service Station Sites.

NSW DEC (2006) Guidelines for the NSW Site Auditor Scheme (2nd ed)

Tables

TABLE LR1: SOIL ANALYTICAL RESULTS

				Sample ID		BH5	BH8	SP1-1	TP1	TP2	TP3	TP4	TP5	TP6	TP7	A2	A3
				Depth		0.5-0.6	0.3-0.4	1.0-1.1	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5	0.5-0.6	0.1-0.2	0.1-0.2	0.0	0.0
				Date Sampled		23/04/06	11/05/06	14/10/11	14/10/11	14/10/11	14/10/11	14/10/11	14/10/11	14/10/11	14/10/11	14/10/11	14/10/11
Analyte		**Units**	**PQL**	**Investigation Criteria**													
				Provisional Phytotoxicity	**Residential Land Use**												
BTEX	Benzene	mg/kg	0.1		1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
	Ethylbenzene	mg/kg	0.1		50	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
	Toluene	mg/kg	0.1		130	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
	Xylene Total	mg/kg	0.3		25	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-
Metals	Arsenic	mg/kg	3	20	100	<5	20	6	4	3	3	66	4	13	5	-	-
	Cadmium	mg/kg	0.3	3	20	<1	<1	1.1	<0.3	0.3	0.4	3.1	<0.3	0.9	0.8	-	-
	Chromium (III+VI)	mg/kg	0.3	400	120,000	9	8	17	11	7.6	16	45	8.1	19	9.1	-	-
	Copper	mg/kg	0.5	100	1000	34	15	54	13	21	33	**2300**	49	170	75	-	-
	Lead	mg/kg	1	600	300	31	37	71	14	34	54	**3100**	77	160	74	-	-
	Mercury	mg/kg	0.05	1	15	<0.1	<0.1	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	0.06	-	-
	Nickel	mg/kg	0.5	60	600	9	8	13	4.9	5.2	6.4	160	6.2	25	8.2	-	-
	Zinc	mg/kg	0.5	200	7000	89	106	270	98	81	160	2800	83	480	170	-	-
OCP	DDT+DDE+DDD	mg/kg	0.1			-	-	<0.6	-	-	<0.6	<0.6	-	<0.1	-	-	-
	Aldrin + Dieldrin	mg/kg	0.1			-	-	<0.2	-	-	<0.2	<0.2	-	<0.2	-	-	-
	Chlordane					-	-	<0.2	-	-	<0.2	<0.2	-	<0.2	-	-	-
	Heptachlor	mg/kg	0.1		10	-	-	<0.1	-	-	<0.1	<0.1	-	<0.1	-	-	-
PAH	Benzo(a)pyrene	mg/kg	0.1		1	<0.5	<0.5	0.3	<0.1	0.1	**1**	<0.1	**100**	0.1	0.6	-	-
	Naphthalene	mg/kg	0.1			-	-	<0.1	<0.1	<0.1	<0.1	<0.1	3.2	<0.1	<0.1	-	-
	PAHs (Sum of total)	mg/kg	0.8		20	1	<0.5	3.4	<0.8	1.9	14	<0.8	**1700**	1.5	10	-	-
PCB	PCBs (Sum of total)	mg/kg	0.9		10	-	-	<0.9	-	-	<0.9	<0.9	-	<0.9	-	-	-
TPH	TPH C6 - C9	mg/kg	20			-	-	<20	<20	<20	<20	<20	<20	<20	<20	-	-
	TPH C10 - C14	mg/kg	20			-	-	<20	<20	<20	<20	<20	<20	<20	<20	-	-
	TPH C15 - C28	mg/kg	50			-	-	<50	<50	<50	<50	<50	2000	<50	<50	-	-
	TPH C29 - C36	mg/kg	50			-	-	<50	<50	<50	<50	<50	1600	<50	<50	-	-
	TPH C10-C36					-	-	<120	<120	<120	<120	<120	**3600**	<120	<120	-	-
Asbestos		%W/W			ND	-	-	<0.01			<0.01	<0.01				Amosite & Chrysotile Asbestos	ND

Notes:

Value Concentration exceeds residential land use criteria

Value Concentration exceeds provisional phytotoxicity criteria

ND Not detected

\- Not Analysed

Criteria:

NSW EPA (1994) Guidelines for Assessing Service Station Sites

NSW DEC (2006) Guidelines for the NSW Site Auditor Scheme (2nd Ed) - Column 1: Residential Landuse

NSW DEC (2006) Guidelines for the NSW Site Auditor Scheme (2nd Ed) - Column 2: Provisional Phytotoxicity

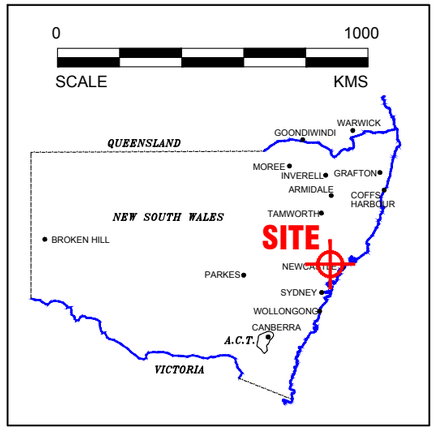
TABLE LR2: SOIL QUALITY CONTROL RESULTS

	Sample ID			TP3	QC2	RPD %
	Depth			0.1-0.2		
	Date Sampled			14/10/2011	14/10/2011	
Analyte		Units	PQL			
BTEX	Benzene	mg/kg	0.1	<0.1	<0.1	NA
	Ethylbenzene	mg/kg	0.1	<0.1	<0.1	NA
	Toluene	mg/kg	0.1	<0.1	<0.1	NA
	Xylene Total	mg/kg	0.3	<0.3	<0.3	NA
Metals	Arsenic	mg/kg	3	3	4	29%
	Cadmium	mg/kg	0.3	0.4	0.4	0%
	Chromium (III+VI)	mg/kg	0.3	16	21	27%
	Copper	mg/kg	0.5	33	28	16%
	Lead	mg/kg	1	54	30	**57%**
	Mercury	mg/kg	0.05	<0.05	<0.05	NA
	Nickel	mg/kg	0.5	6.4	7.8	20%
	Zinc	mg/kg	0.5	160	180	12%
OCP	DDT+DDE+DDD	mg/kg	0.1	<0.6	<0.6	NA
	Aldrin + Dieldrin	mg/kg	0.1	<0.2	<0.2	NA
	Chlordane			<0.2	<0.2	NA
	Heptachlor	mg/kg	0.1	<0.1	<0.1	NA
PAH	Acenaphthene	mg/kg	0.1	<0.1	<0.1	NA
	Acenaphthylene	mg/kg	0.1	<0.1	<0.1	NA
	Anthracene	mg/kg	0.1	0.5	<0.1	NA
	Benz(a)anthracene	mg/kg	0.1	1	0.3	**108%**
	Benzo(a)pyrene	mg/kg	0.1	1	0.3	**108%**
	Benzo(b)fluoranthene	mg/kg	0.1	0.7	0.2	**111%**
	Benzo(g,h,i)perylene	mg/kg	0.1	0.7	0.2	**111%**
	Benzo(k)fluoranthene	mg/kg	0.1	0.7	0.2	**111%**
	Chrysene	mg/kg	0.1	0.8	0.2	**120%**
	Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	NA
	Fluoranthene	mg/kg	0.1	3.4	0.6	**140%**
	Fluorene	mg/kg	0.1	<0.1	<0.1	NA
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	0.5	0.1	**133%**
	Naphthalene	mg/kg	0.1	<0.1	<0.1	NA
	PAHs (Sum of total)	mg/kg	0.8	14	2.9	**131%**
	Phenanthrene	mg/kg	0.1	0.9	0.2	**127%**
	Pyrene	mg/kg	0.1	3.3	0.6	**138%**
PCB	PCBs (Sum of total)	mg/kg	0.9	<0.9	<0.9	NA
TPH	TPH C6 - C9	mg/kg	20	<20	<20	NA
	TPH C10 - C14	mg/kg	20	<20	<20	NA
	TPH C15 - C28	mg/kg	50	<50	<50	NA
	TPH C29 - C36	mg/kg	50	<50	<50	NA
	TPH C10-C36			<120	<120	NA

Notes:

RPD% RPD exceeds control limit of 50%

Figures



Aerial image source: Google Earth Pro 2011
Aerial image ©: Sinclair Knight Merz 2011

0 25 50 75 100 125
SCALE 1:2500 (A3) METRES

revision	description	drawn	approved	date

drawn	CGT
approved	EMC
date	25/10/2011
scale	AS SHOWN
original size	A3

coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

client: EJE ARCHITECTURE PTY LTD

project: MAROBA APARTMENTS - CONTAMINATION ASSESSMENT
CORNER EDITH AND HIGH STREETS
WARATAH, NSW

title: SITE LOCALITY PLAN

project no: ENAUWARA04216AA

figure no: FIGURE 1

IMAGE SOURCE: Nearmap.com, Hypertiles, 17/09/2011

N

LEGEND

TP02 TEST PIT SAMPLING LOCATIONS (Coffey, October 2011)

BH8 GEOTECHNICAL BOREHOLE LOCATIONS (2007) BORE LOCATIONS

A2 POTENTIAL ASBESTOS CONTAINING MATERIAL SAMPLE

revision	description	drawn	approved	date

0 5 10 15 20 25
SCALE 1:500 (A3) METRES

drawn	CGT
approved	EMC
date	25/10/2011
scale	AS SHOWN
original size	A3

coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

client: EJE ARCHITECTURE PTY LTD

project: MAROBA APARTMENTS - CONTAMINATION ASSESSMENT
CORNER EDITH AND HIGH STREETS
WARATAH, NSW

title: SAMPLING LOCATION PLAN

project no: ENAUWARA04216AA

figure no: FIGURE 2

IMAGE SOURCE: Nearmap.com, Hypertiles, 17/09/2011

N

LEGEND

TP02 — TEST PIT SAMPLING LOCATIONS (Coffey, October 2011)

BH8 — GEOTECHNICAL BOREHOLE LOCATIONS (2007) BORE LOCATIONS

A2 — POTENTIAL ASBESTOS CONTAINING MATERIAL SAMPLE

APPROXIMATE FORMER BUILDING FOOTPRINT

Sample	Sample Depth (mBGS)
Analyte	mg/kg

SHADED VALUES INDICATE CONCENTRATION EXCEEDS RESIDENTIAL LAND USE CRITERIA

SHADED VALUES INDICATE CONCENTRATION EXCEEDS PROVISIONAL PHYTOTOXICITY CRITERIA

revision	description	drawn	approved	date

0 5 10 15 20 25
SCALE 1:500 (A3) METRES

drawn	CGT
approved	EMC
date	25/10/2011
scale	AS SHOWN
original size	A3

coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

client: EJE ARCHITECTURE PTY LTD

project: MAROBA APARTMENTS - CONTAMINATION ASSESSMENT
CORNER EDITH AND HIGH STREETS
WARATAH, NSW

title: SOIL CONTAMINATION

project no: ENAUWARA04216AA

figure no: FIGURE 3

Appendix A
Site Photographs

Photograph 1: Site looking towards south, also shows sandstone rock outcrop

Photograph 2: Fill mound on eastern boundary, with bitumen paving and trees/shrubs on eastern boundary

drawn	**ELC**	coffey environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	client:	**EJE ARCHITECTURE PTY LTD**	
approved			project:	**MAROBA APARTMENTS** **CNR EDITH & HIGH STREETS, WARATAH NSW**	
date	**25/10/2011**		title:	**SITE PHOTOGRAPHS**	
scale	**NTS**		project no:	**ENAUWARA04216AA**	figure no: **PHOTO 1 &**
original size	**A4**				

Photograph 3: Site looking towards the north, fill mound is present on property to the north

Photograph 4: Test pit TP4 showing metal fragments at about 0.2m to 1.0m

drawn	**ELC**	coffey environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	client:	**EJE ARCHITECTURE PTY LTD**
approved			project:	**MAROBA APARTMENTS** **CNR EDITH & HIGH STREETS, WARATAH NSW**
date	**25/10/2011**			
scale	**NTS**		title:	**SITE PHOTOGRAPHS**
original size	**A4**		project no: **ENAUWARA04216AA**	figure no: **PHOTO 3 &**

Photograph 5: Site showing fragments of tiles, bricks, concrete and plastic

Photograph 4: Site looking towards the north, existing Maroba Apartments to north

drawn	**ELC**	coffey environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE	client:	**EJE ARCHITECTURE PTY LTD**
approved			project:	**MAROBA APARTMENTS** **CNR EDITH & HIGH STREETS, WARATAH NSW**
date	**25/10/2011**			
scale	**NTS**		title:	**SITE PHOTOGRAPHS**
original size	**A4**		project no: **ENAUWARA04216AA**	figure no: **PHOTO 5 &**

Appendix B
Test Pit Logs

coffey environments

Engineering Log - Excavation

Excavation No. **TP 1**

Sheet 1 of 1

Office Job No.: **ENAUWARA04216AA**

Client: **EJE ARCHITECTURE**

Date started: **14.10.2011**

Principal:

Date completed: **14.10.2011**

Project: **CONTAMINATION ASSESSMENT**

Logged by: **SM**

Test pit location: **REFER TO FIGURES**

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
E		N	None Observed	E					**FILL:** Gravelly SAND, medium grained, brown-dark brown, angular gravel, broken tiles and plastic at surface.	D-M	L		FILL
						0.5			Termnated at practical refusal on natural sandstone. Test pit TP 1 terminated at 0.4m				
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- S shoring
- N nil

penetration
1 2 3 4 — no resistance ranging to refusal

water
- water level on date shown
- water inflow
- water outflow

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- V vane shear (kPa)
- Bs bulk sample
- E environmental sample
- R refusal

classification symbols and soil description
based on unified classification system

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- W_L liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Engineering Log - Excavation

Excavation No. **TP 2**

Sheet 1 of 1

Office Job No.: **ENAUWARA04216AA**

Client: ***EJE ARCHITECTURE***

Date started: ***14.10.2011***

Principal:

Date completed: ***14.10.2011***

Project: ***CONTAMINATION ASSESSMENT***

Logged by: ***SM***

Test pit location: ***REFER TO FIGURES***

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information						material substance					
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa (100 200 300 400)	structure and additional observations
E		N	None Observed	E	0.0			**FILL:** Gravelly SAND, fine to medium grained, dark brown angular gravel, broken tiles at surface.	M	L		FILL
								Terminated at refusal on natural sandstone. Test pit TP 2 terminated at 0.2m				
					0.5							
					1.0							
					1.5							
					2.0							
					2.5							
					3.0							
					3.5							
					4.0							

Sketch

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- S shoring
- N nil

penetration (1 2 3 4) — no resistance ranging to refusal

water
- water level on date shown
- water inflow
- water outflow

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- V vane shear (kPa)
- Bs bulk sample
- E environmental sample
- R refusal

classification symbols and soil description
based on unified classification system

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- W_L liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Engineering Log - Excavation

Excavation No. **TP 3**

Sheet 1 of 1

Office Job No.: **ENAUWARA04216AA**

Client: ***EJE ARCHITECTURE***

Date started: ***14.10.2011***

Principal:

Date completed: ***14.10.2011***

Project: ***CONTAMINATION ASSESSMENT***

Logged by: ***SM***

Test pit location: ***REFER TO FIGURES***

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
E		N	None Observed	E					**FILL:** Gravelly SAND, medium grained, dark brown, crushed tiles throughout, with trace whole bricks.	M	L		FILL
				E		0.5		CH	**Sandy CLAY:** medium to high plasticity, pale orange-brown, fine grained sand.		St		RESIDUAL
						1.0			Terminated on natural sandstone. Test pit TP 3 terminated at 0.8m				
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- S shoring
- N nil

penetration
1 2 3 4 — no resistance ranging to refusal

water
- water level on date shown
- water inflow
- water outflow

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- V vane shear (kPa)
- Bs bulk sample
- E environmental sample
- R refusal

classification symbols and soil description
based on unified classification system

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- W_L liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Engineering Log - Excavation

Excavation No. **TP 4**

Sheet 1 of 1

Office Job No.: **ENAUWARA04216AA**

Client: ***EJE ARCHITECTURE***

Date started: ***14.10.2011***

Principal:

Date completed: ***14.10.2011***

Project: ***CONTAMINATION ASSESSMENT***

Logged by: ***SM***

Test pit location: ***REFER TO FIGURES***

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
E		N	None Observed	E		0.0			**FILL:** Gravelly SAND, medium grained, dark brown, angular gravel mixed with broken tiles at surface.	M	L		FILL
				E		0.5			**FILL:** Rusted metal fragments dark brown sand. With trace tiles, pottery and consolidated slag.		VL		
				E		1.0		CH	**CLAY:** medium to high plasticity, pale grey.		St		RESIDUAL
						1.5							
						2.0			Terminated on natural sandstone. Test pit TP 4 terminated at 1.7m				
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- S shoring
- N nil

penetration 1 2 3 4 — no resistance ranging to refusal

water
- water level on date shown
- water inflow
- water outflow

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- V vane shear (kPa)
- Bs bulk sample
- E environmental sample
- R refusal

classification symbols and soil description based on unified classification system

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- W_L liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Engineering Log - Excavation

Excavation No. **TP 5**

Sheet 1 of 1

Office Job No.: **ENAUWARA04216AA**

Client: ***EJE ARCHITECTURE***

Date started: ***14.10.2011***

Principal:

Date completed: ***14.10.2011***

Project: ***CONTAMINATION ASSESSMENT***

Logged by: ***SM***

Test pit location: ***REFER TO FIGURES***

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
E		N		E					**FILL:** Gravelly SAND, medium grained, dark brown, trace of tile fragments.	D-M	L		FILL
			Perched	E		0.5			**FILL:** Clayey GRAVEL, angular and rounded, dark grey. Perched groundwater.	W	VL		
				E		1.0		CH	**CLAY:** high plasticity, dark grey.	M	St		RESIDUAL
						1.5							
						2.0			Terminated in natural clay. Test pit TP 5 terminated at 1.7m				
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

method

N	natural exposure
X	existing excavation
BH	backhoe bucket
B	bulldozer blade
R	ripper
E	excavator

support

S shoring N nil

penetration

1 2 3 4 — no resistance ranging to refusal

water

water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Engineering Log - Excavation

Excavation No. ***TP 6***

Sheet 1 of 1

Office Job No.: ***ENAUWARA04216AA***

Client: ***EJE ARCHITECTURE***

Date started: ***14.10.2011***

Principal:

Date completed: ***14.10.2011***

Project: ***CONTAMINATION ASSESSMENT***

Logged by: ***SM***

Test pit location: ***REFER TO FIGURES***

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information						material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
E		N	None Observed	E	0.5			**FILL:** Sandy CLAY, medium plasticity, dark brown, fine to medium grained sand. Concrete and tile fragments in upper 0.3m.	M	St		FILL
				E	1.0 / 1.5 / 2.0 / 2.5		SM	**Clayey SAND:** fine grained, grey.		MD		RESIDUAL
					3.0 / 3.5 / 4.0			Terminated in natural soil. Test pit TP 6 terminated at 2.5m				

Sketch

method

N	natural exposure
X	existing excavation
BH	backhoe bucket
B	bulldozer blade
R	ripper
E	excavator

support

S shoring N nil

penetration

1 2 3 4 — no resistance ranging to refusal

water

water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Engineering Log - Excavation

Excavation No. **TP 7**

Sheet 1 of 1

Office Job No.: **ENAUWARA04216AA**

Client: **EJE ARCHITECTURE**

Date started: **14.10.2011**

Principal:

Date completed: **14.10.2011**

Project: **CONTAMINATION ASSESSMENT**

Logged by: **SM**

Test pit location: **REFER TO FIGURES**

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information						material substance					
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
E		N	None Observed	E	0.0			**FILL:** Sandy CLAY, medium plasticity, dark brown, fine grained sand.				FILL
				E	0.5		SM	**Clayey SAND:** fine grained, grey.	M	MD		RESIDUAL
					1.0							
					1.5			Terminated in natural soil. Test pit TP 7 terminated at 1.5m				
					2.0							
					2.5							
					3.0							
					3.5							
					4.0							

Sketch

method

N	natural exposure
X	existing excavation
BH	backhoe bucket
B	bulldozer blade
R	ripper
E	excavator

support

S shoring N nil

penetration

1 2 3 4 — no resistance ranging to refusal

water

water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey environments

Engineering Log - Excavation

Excavation No. **TP 8**

Sheet 1 of 1

Office Job No.: **ENAUWARA04216AA**

Client: ***EJE ARCHITECTURE***

Date started: ***14.10.2011***

Principal:

Date completed: ***14.10.2011***

Project: ***CONTAMINATION ASSESSMENT***

Logged by: ***SM***

Test pit location: ***REFER TO FIGURES***

Checked by:

equipment type and model: 1.5t Excavator | Pit Orientation: | Easting: m | R.L. Surface: Not Measured

excavation dimensions: 3m long 0.5m wide | Northing: m | datum:

excavation information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
E		N	None Observed	SP1-1		0.5			**FILL:** Sandy CLAY, medium plasticity, dark brown, medium grained sand, frequent tile fragments and whole bricks.	M	St		FILL
						1.0							
						1.5			Terminated in fill material. Test pit TP 8 terminated at 1.4m				
						2.0							
						2.5							
						3.0							
						3.5							
						4.0							

Sketch

method

N	natural exposure
X	existing excavation
BH	backhoe bucket
B	bulldozer blade
R	ripper
E	excavator

support

S shoring N nil

penetration

1 2 3 4 — no resistance ranging to refusal

water

water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Appendix C
Laboratory Reports

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Emma Coleman
Client Address	Coffey Environments Pty Ltd Lot 101, 19 Warabrook Blvd Warabrook NSW 2304
Telephone	02 4016 2300
Facsimile	02 4016 2380
Email	emma_coleman@coffey.com
Project	**ENAUWARA04216AA**
Order Number	**49615-49616**
Samples	11

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory Address	SGS Alexandria Environmental Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE102630 R0
Report Number	0000010179
Date Reported	24 Oct 2011
Date Received	18 Oct 2011

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

No respirable fibres detected using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

PAH - The Limit of Reporting (LOR) has been raised due to interferences from the sample matrix.

SIGNATORIES

Dong Liang
Inorganics Metals Team Leader

Huong Crawford
Laboratory Manager

Ly Kim Ha
Organics Supervisor

Ravee Sivasubramaniam
Hygienist

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.001 Soil 14 Oct 2011 TP01 0.1-0.2	SE102630.002 Soil 14 Oct 2011 TP02 0.1-0.2	SE102630.003 Soil 14 Oct 2011 TP03 0.1-0.2	SE102630.004 Soil 14 Oct 2011 TP04 0.4-0.5	SE102630.005 Soil 14 Oct 2011 TP05 0.5-0.6
VOC's in Soil Method: AN433/AN434								
Monocyclic Aromatic Hydrocarbons								
Benzene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Surrogates								
Dibromofluoromethane (Surrogate)	%	-		**95**	**95**	**94**	**95**	**94**
d4-1,2-dichloroethane (Surrogate)	%	-		**96**	**97**	**96**	**97**	**96**
d8-toluene (Surrogate)	%	-		**93**	**94**	**94**	**94**	**94**
Bromofluorobenzene (Surrogate)	%	-		**105**	**106**	**102**	**104**	**102**
Totals								
Total BTEX*	mg/kg	-		**0**	**0**	**0**	**0**	**0**
Total Xylenes*	mg/kg	0.3		<0.3	<0.3	<0.3	<0.3	<0.3
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434								
TRH C6-C9	mg/kg	20		<20	<20	<20	<20	<20
Surrogates								
Trifluorotoluene (Surrogate)	%	-		**89**	**101**	**91**	**82**	**89**
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403								
TRH C10-C14	mg/kg	20		<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	50		<50	<50	<50	<50	**2000**
TRH C29-C36	mg/kg	50		<50	<50	<50	<50	**1600**
Surrogates								
TRH (Surrogate)	%	-		-	-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420								
Naphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	**3.2**
Acenaphthylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	**3.9**
Acenaphthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	**4.8**
Fluorene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	**10**
Phenanthrene	mg/kg	0.1		<0.1	**0.2**	**0.9**	<0.1	**120**
Anthracene	mg/kg	0.1		<0.1	<0.1	**0.5**	<0.1	**29**
Fluoranthene	mg/kg	0.1		<0.1	**0.5**	**3.4**	<0.1	**540**
Pyrene	mg/kg	0.1		<0.1	**0.4**	**3.3**	<0.1	**480**
Benzo(a)anthracene	mg/kg	0.1		<0.1	**0.1**	**1.0**	<0.1	**91**
Chrysene	mg/kg	0.1		<0.1	**0.2**	**0.8**	<0.1	**71**
Benzo(b)fluoranthene	mg/kg	0.1		<0.1	**0.1**	**0.7**	<0.1	**96**
Benzo(k)fluoranthene	mg/kg	0.1		<0.1	**0.1**	**0.7**	<0.1	**38**
Benzo(a)pyrene	mg/kg	0.1		<0.1	**0.1**	**1.0**	<0.1	**100**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		<0.1	<0.1	**0.5**	<0.1	**52**
Dibenzo(a&h)anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	**7.6**
Benzo(ghi)perylene	mg/kg	0.1		<0.1	**0.1**	**0.7**	<0.1	**56**
Total PAH (Vic EPA)	mg/kg	0.8		<0.8	**1.9**	**14**	<0.8	**1700**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.001 Soil 14 Oct 2011 TP01 0.1-0.2	SE102630.002 Soil 14 Oct 2011 TP02 0.1-0.2	SE102630.003 Soil 14 Oct 2011 TP03 0.1-0.2	SE102630.004 Soil 14 Oct 2011 TP04 0.4-0.5	SE102630.005 Soil 14 Oct 2011 TP05 0.5-0.6
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)								
Surrogates								
d5-nitrobenzene (Surrogate)	%	-		**104**	**106**	**106**	**108**	**80**
2-fluorobiphenyl (Surrogate)	%	-		**92**	**92**	**90**	**92**	**80**
d14-p-terphenyl (Surrogate)	%	-		**104**	**110**	**118**	**108**	**120**
OC Pesticides in Soil Method: AN400/AN420								
Hexachlorobenzene (HCB)	mg/kg	0.1		-	-	<0.1	<0.1	-
Alpha BHC	mg/kg	0.1		-	-	<0.1	<0.1	-
Lindane	mg/kg	0.1		-	-	<0.1	<0.1	-
Heptachlor	mg/kg	0.1		-	-	<0.1	<0.1	-
Aldrin	mg/kg	0.1		-	-	<0.1	<0.1	-
Beta BHC	mg/kg	0.1		-	-	<0.1	<0.1	-
Delta BHC	mg/kg	0.1		-	-	<0.1	<0.1	-
Heptachlor epoxide	mg/kg	0.1		-	-	<0.1	<0.1	-
o,p'-DDE	mg/kg	0.1		-	-	<0.1	<0.1	-
Alpha Endosulfan	mg/kg	0.2		-	-	<0.2	<0.2	-
Gamma Chlordane	mg/kg	0.1		-	-	<0.1	<0.1	-
Alpha Chlordane	mg/kg	0.1		-	-	<0.1	<0.1	-
trans-Nonachlor	mg/kg	0.1		-	-	<0.1	<0.1	-
p,p'-DDE	mg/kg	0.1		-	-	<0.1	<0.1	-
Dieldrin	mg/kg	0.2		-	-	<0.2	<0.2	-
Endrin	mg/kg	0.2		-	-	<0.2	<0.2	-
o,p'-DDD	mg/kg	0.1		-	-	<0.1	<0.1	-
o,p'-DDT	mg/kg	0.1		-	-	<0.1	<0.1	-
Beta Endosulfan	mg/kg	0.2		-	-	<0.2	<0.2	-
p,p'-DDD	mg/kg	0.1		-	-	<0.1	<0.1	-
p,p'-DDT	mg/kg	0.1		-	-	<0.1	<0.1	-
Endosulfan sulphate	mg/kg	0.1		-	-	<0.1	<0.1	-
Endrin Aldehyde	mg/kg	0.1		-	-	<0.1	<0.1	-
Methoxychlor	mg/kg	0.1		-	-	<0.1	<0.1	-
Endrin Ketone	mg/kg	0.1		-	-	<0.1	<0.1	-
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	**97**	**98**	-
PCBs in Soil Method: AN400/AN420								
Arochlor 1016	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1221	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1232	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1242	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1248	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1254	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1260	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1262	mg/kg	0.1		-	-	<0.1	<0.1	-
Arochlor 1268	mg/kg	0.1		-	-	<0.1	<0.1	-
Total PCBs (Arochlors)	mg/kg	0.9		-	-	<0.9	<0.9	-
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	**97**	**98**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.001 Soil 14 Oct 2011 TP01 0.1-0.2	SE102630.002 Soil 14 Oct 2011 TP02 0.1-0.2	SE102630.003 Soil 14 Oct 2011 TP03 0.1-0.2	SE102630.004 Soil 14 Oct 2011 TP04 0.4-0.5	SE102630.005 Soil 14 Oct 2011 TP05 0.5-0.6
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320								
Arsenic, As	mg/kg	3		**4**	**3**	**3**	**66**	**4**
Cadmium, Cd	mg/kg	0.3		<0.3	**0.3**	**0.4**	**3.1**	<0.3
Chromium, Cr	mg/kg	0.3		**11**	**7.6**	**16**	**45**	**8.1**
Copper, Cu	mg/kg	0.5		**13**	**21**	**33**	**2300**	**49**
Lead, Pb	mg/kg	1		**14**	**34**	**54**	**3100**	**77**
Nickel, Ni	mg/kg	0.5		**4.9**	**5.2**	**6.4**	**160**	**6.2**
Zinc, Zn	mg/kg	0.5		**98**	**81**	**160**	**2800**	**83**
Mercury in Soil Method: AN312								
Mercury	mg/kg	0.05		<0.05	**0.06**	<0.05	<0.05	<0.05
Fibre Identification in soil Method: AN602								
FibreID								
Asbestos Detected	No unit	-		-	-	No	No	-
SemiQuant								
Estimated Fibres	%w/w	0.01		-	-	<0.01	<0.01	-
Fibre ID in bulk materials Method: AN602								
FibreID								
Asbestos Detected	No unit	-		-	-	-	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		**10**	**11**	**11**	**12**	**16**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.006 Soil 14 Oct 2011 TP06 0.1-0.2	SE102630.007 Soil 14 Oct 2011 TP07 0.1-0.2	SE102630.008 Soil 14 Oct 2011 SP1-1	SE102630.009 Soil 14 Oct 2011 QC2	SE102630.010 Material 14 Oct 2011 A2
VOC's in Soil Method: AN433/AN434								
Monocyclic Aromatic Hydrocarbons								
Benzene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Toluene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Ethylbenzene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
m/p-xylene	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2	-
o-xylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Surrogates								
Dibromofluoromethane (Surrogate)	%	-		**96**	**93**	**94**	**94**	-
d4-1,2-dichloroethane (Surrogate)	%	-		**99**	**96**	**95**	**95**	-
d8-toluene (Surrogate)	%	-		**94**	**94**	**95**	**94**	-
Bromofluorobenzene (Surrogate)	%	-		**105**	**104**	**103**	**103**	-
Totals								
Total BTEX*	mg/kg	-		**0**	**0**	**0**	**0**	-
Total Xylenes*	mg/kg	0.3		<0.3	<0.3	<0.3	<0.3	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434								
TRH C6-C9	mg/kg	20		<20	<20	<20	<20	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.006 Soil 14 Oct 2011 TP06 0.1-0.2	SE102630.007 Soil 14 Oct 2011 TP07 0.1-0.2	SE102630.008 Soil 14 Oct 2011 SP1-1	SE102630.009 Soil 14 Oct 2011 QC2	SE102630.010 Material 14 Oct 2011 A2
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434 (continued)								
Surrogates								
Trifluorotoluene (Surrogate)	%	-		**91**	**97**	**91**	**98**	-
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403								
TRH C10-C14	mg/kg	20		<20	<20	<20	<20	-
TRH C15-C28	mg/kg	50		<50	<50	<50	<50	-
TRH C29-C36	mg/kg	50		<50	<50	<50	<50	-
Surrogates								
TRH (Surrogate)	%	-		-	-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420								
Naphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Acenaphthylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Acenaphthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Fluorene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Phenanthrene	mg/kg	0.1		**0.1**	**1.0**	**0.2**	**0.2**	-
Anthracene	mg/kg	0.1		<0.1	**0.5**	**0.1**	<0.1	-
Fluoranthene	mg/kg	0.1		**0.4**	**2.5**	**0.8**	**0.6**	-
Pyrene	mg/kg	0.1		**0.4**	**2.3**	**0.7**	**0.6**	-
Benzo(a)anthracene	mg/kg	0.1		**0.2**	**0.7**	**0.3**	**0.3**	-
Chrysene	mg/kg	0.1		**0.1**	**0.7**	**0.2**	**0.2**	-
Benzo(b)fluoranthene	mg/kg	0.1		**0.1**	**0.6**	**0.3**	**0.2**	-
Benzo(k)fluoranthene	mg/kg	0.1		**0.1**	**0.5**	**0.2**	**0.2**	-
Benzo(a)pyrene	mg/kg	0.1		**0.1**	**0.6**	**0.3**	**0.3**	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		<0.1	**0.3**	**0.1**	**0.1**	-
Dibenzo(a&h)anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-
Benzo(ghi)perylene	mg/kg	0.1		<0.1	**0.4**	**0.2**	**0.2**	-
Total PAH (Vic EPA)	mg/kg	0.8		**1.5**	**10**	**3.4**	**2.9**	-
Surrogates								
d5-nitrobenzene (Surrogate)	%	-		**104**	**104**	**102**	**106**	-
2-fluorobiphenyl (Surrogate)	%	-		**94**	**98**	**90**	**88**	-
d14-p-terphenyl (Surrogate)	%	-		**118**	**120**	**122**	**114**	-
OC Pesticides in Soil Method: AN400/AN420								
Hexachlorobenzene (HCB)	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Alpha BHC	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Lindane	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Heptachlor	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Aldrin	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Beta BHC	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Delta BHC	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Heptachlor epoxide	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
o,p'-DDE	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Alpha Endosulfan	mg/kg	0.2		<0.2	-	<0.2	<0.2	-
Gamma Chlordane	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Alpha Chlordane	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
trans-Nonachlor	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
p,p'-DDE	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Dieldrin	mg/kg	0.2		<0.2	-	**0.2**	<0.2	-
Endrin	mg/kg	0.2		<0.2	-	<0.2	<0.2	-
o,p'-DDD	mg/kg	0.1		<0.1	-	<0.1	<0.1	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.006 Soil 14 Oct 2011 TP06 0.1-0.2	SE102630.007 Soil 14 Oct 2011 TP07 0.1-0.2	SE102630.008 Soil 14 Oct 2011 SP1-1	SE102630.009 Soil 14 Oct 2011 QC2	SE102630.010 Material 14 Oct 2011 A2
OC Pesticides in Soil Method: AN400/AN420 (continued)								
o,p'-DDT	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Beta Endosulfan	mg/kg	0.2		<0.2	-	<0.2	<0.2	-
p,p'-DDD	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
p,p'-DDT	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Endosulfan sulphate	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Endrin Aldehyde	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Methoxychlor	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Endrin Ketone	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		**101**	-	**115**	**95**	-
PCBs in Soil Method: AN400/AN420								
Arochlor 1016	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1221	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1232	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1242	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1248	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1254	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1260	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1262	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Arochlor 1268	mg/kg	0.1		<0.1	-	<0.1	<0.1	-
Total PCBs (Arochlors)	mg/kg	0.9		<0.9	-	<0.9	<0.9	-
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		**101**	-	**115**	**95**	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320								
Arsenic, As	mg/kg	3		**13**	**5**	**6**	**4**	-
Cadmium, Cd	mg/kg	0.3		**0.9**	**0.8**	**1.1**	**0.4**	-
Chromium, Cr	mg/kg	0.3		**19**	**9.1**	**17**	**21**	-
Copper, Cu	mg/kg	0.5		**170**	**75**	**54**	**28**	-
Lead, Pb	mg/kg	1		**160**	**74**	**71**	**30**	-
Nickel, Ni	mg/kg	0.5		**25**	**8.2**	**13**	**7.8**	-
Zinc, Zn	mg/kg	0.5		**480**	**170**	**270**	**180**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.006 Soil 14 Oct 2011 TP06 0.1-0.2	SE102630.007 Soil 14 Oct 2011 TP07 0.1-0.2	SE102630.008 Soil 14 Oct 2011 SP1-1	SE102630.009 Soil 14 Oct 2011 QC2	SE102630.010 Material 14 Oct 2011 A2
Mercury in Soil Method: AN312								
Mercury	mg/kg	0.05		<0.05	**0.06**	<0.05	<0.05	-
Fibre Identification in soil Method: AN602								
FibreID								
Asbestos Detected	No unit	-		-	-	No	-	-
SemiQuant								
Estimated Fibres	%w/w	0.01		-	-	<0.01	-	-
Fibre ID in bulk materials Method: AN602								
FibreID								
Asbestos Detected	No unit	-		-	-	-	-	Yes
Moisture Content Method: AN234								
% Moisture	%	0.5		**13**	**18**	**18**	**9.3**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE102630.011 Material 14 Oct 2011 A3
VOC's in Soil Method: AN433/AN434				
Monocyclic Aromatic Hydrocarbons				
Benzene	mg/kg	0.1		-
Toluene	mg/kg	0.1		-
Ethylbenzene	mg/kg	0.1		-
m/p-xylene	mg/kg	0.2		-
o-xylene	mg/kg	0.1		-
Surrogates				
Dibromofluoromethane (Surrogate)	%	-		-
d4-1,2-dichloroethane (Surrogate)	%	-		-
d8-toluene (Surrogate)	%	-		-
Bromofluorobenzene (Surrogate)	%	-		-
Totals				
Total BTEX*	mg/kg	-		-
Total Xylenes*	mg/kg	0.3		-
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434				
TRH C6-C9	mg/kg	20		-
Surrogates				
Trifluorotoluene (Surrogate)	%	-		-
Dibromofluoromethane (Surrogate)	%	-		-
d4-1,2-dichloroethane (Surrogate)	%	-		-
d8-toluene (Surrogate)	%	-		-
Bromofluorobenzene (Surrogate)	%	-		-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403				
TRH C10-C14	mg/kg	20		-
TRH C15-C28	mg/kg	50		-
TRH C29-C36	mg/kg	50		-

Parameter	Units	LOR	Sample Number SE102630.011 Sample Matrix Material Sample Date 14 Oct 2011 Sample Name A3
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 (continued)			
Surrogates			
TRH (Surrogate)	%	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420			
Naphthalene	mg/kg	0.1	-
Acenaphthylene	mg/kg	0.1	-
Acenaphthene	mg/kg	0.1	-
Fluorene	mg/kg	0.1	-
Phenanthrene	mg/kg	0.1	-
Anthracene	mg/kg	0.1	-
Fluoranthene	mg/kg	0.1	-
Pyrene	mg/kg	0.1	-
Benzo(a)anthracene	mg/kg	0.1	-
Chrysene	mg/kg	0.1	-
Benzo(b)fluoranthene	mg/kg	0.1	-
Benzo(k)fluoranthene	mg/kg	0.1	-
Benzo(a)pyrene	mg/kg	0.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-
Dibenzo(a&h)anthracene	mg/kg	0.1	-
Benzo(ghi)perylene	mg/kg	0.1	-
Total PAH (Vic EPA)	mg/kg	0.8	-
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	-
2-fluorobiphenyl (Surrogate)	%	-	-
d14-p-terphenyl (Surrogate)	%	-	-
OC Pesticides in Soil Method: AN400/AN420			
Hexachlorobenzene (HCB)	mg/kg	0.1	-
Alpha BHC	mg/kg	0.1	-
Lindane	mg/kg	0.1	-
Heptachlor	mg/kg	0.1	-
Aldrin	mg/kg	0.1	-
Beta BHC	mg/kg	0.1	-
Delta BHC	mg/kg	0.1	-
Heptachlor epoxide	mg/kg	0.1	-
o,p'-DDE	mg/kg	0.1	-
Alpha Endosulfan	mg/kg	0.2	-
Gamma Chlordane	mg/kg	0.1	-
Alpha Chlordane	mg/kg	0.1	-
trans-Nonachlor	mg/kg	0.1	-
p,p'-DDE	mg/kg	0.1	-
Dieldrin	mg/kg	0.2	-
Endrin	mg/kg	0.2	-
o,p'-DDD	mg/kg	0.1	-
o,p'-DDT	mg/kg	0.1	-
Beta Endosulfan	mg/kg	0.2	-
p,p'-DDD	mg/kg	0.1	-
p,p'-DDT	mg/kg	0.1	-
Endosulfan sulphate	mg/kg	0.1	-
Endrin Aldehyde	mg/kg	0.1	-
Methoxychlor	mg/kg	0.1	-
Endrin Ketone	mg/kg	0.1	-

Parameter	Units	LOR	Sample Number: SE102630.011 Sample Matrix: Material Sample Date: 14 Oct 2011 Sample Name: A3
OC Pesticides in Soil Method: AN400/AN420 (continued)			
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-
PCBs in Soil Method: AN400/AN420			
Arochlor 1016	mg/kg	0.1	-
Arochlor 1221	mg/kg	0.1	-
Arochlor 1232	mg/kg	0.1	-
Arochlor 1242	mg/kg	0.1	-
Arochlor 1248	mg/kg	0.1	-
Arochlor 1254	mg/kg	0.1	-
Arochlor 1260	mg/kg	0.1	-
Arochlor 1262	mg/kg	0.1	-
Arochlor 1268	mg/kg	0.1	-
Total PCBs (Arochlors)	mg/kg	0.9	-
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320			
Arsenic, As	mg/kg	3	-
Cadmium, Cd	mg/kg	0.3	-
Chromium, Cr	mg/kg	0.3	-
Copper, Cu	mg/kg	0.5	-
Lead, Pb	mg/kg	1	-
Nickel, Ni	mg/kg	0.5	-
Zinc, Zn	mg/kg	0.5	-
Mercury in Soil Method: AN312			
Mercury	mg/kg	0.05	-
Fibre Identification in soil Method: AN602			
FibreID			
Asbestos Detected	No unit	-	-
SemiQuant			
Estimated Fibres	%w/w	0.01	-
Fibre ID in bulk materials Method: AN602			
FibreID			
Asbestos Detected	No unit	-	No
Moisture Content Method: AN234			
% Moisture	%	0.5	-

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil Method: ME-(AU)-[ENV]AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB007353	mg/kg	0.05	<0.05	0%	92%	81%

Moisture Content Method: ME-(AU)-[ENV]AN234

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB007245	%	0.5	0 - 22%

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Hexachlorobenzene (HCB)	LB007241	mg/kg	0.1	<0.1	NA
Alpha BHC	LB007241	mg/kg	0.1	<0.1	NA
Lindane	LB007241	mg/kg	0.1	<0.1	NA
Heptachlor	LB007241	mg/kg	0.1	<0.1	118%
Aldrin	LB007241	mg/kg	0.1	<0.1	114%
Beta BHC	LB007241	mg/kg	0.1	<0.1	NA
Delta BHC	LB007241	mg/kg	0.1	<0.1	95%
Heptachlor epoxide	LB007241	mg/kg	0.1	<0.1	NA
o,p'-DDE	LB007241	mg/kg	0.1	<0.1	NA
Alpha Endosulfan	LB007241	mg/kg	0.2	<0.2	NA
Gamma Chlordane	LB007241	mg/kg	0.1	<0.1	NA
Alpha Chlordane	LB007241	mg/kg	0.1	<0.1	NA
trans-Nonachlor	LB007241	mg/kg	0.1	<0.1	NA
p,p'-DDE	LB007241	mg/kg	0.1	<0.1	NA
Dieldrin	LB007241	mg/kg	0.2	<0.2	109%
Endrin	LB007241	mg/kg	0.2	<0.2	110%
o,p'-DDD	LB007241	mg/kg	0.1	<0.1	NA
o,p'-DDT	LB007241	mg/kg	0.1	<0.1	NA
Beta Endosulfan	LB007241	mg/kg	0.2	<0.2	NA
p,p'-DDD	LB007241	mg/kg	0.1	<0.1	NA
p,p'-DDT	LB007241	mg/kg	0.1	<0.1	94%
Endosulfan sulphate	LB007241	mg/kg	0.1	<0.1	NA
Endrin Aldehyde	LB007241	mg/kg	0.1	<0.1	NA
Methoxychlor	LB007241	mg/kg	0.1	<0.1	NA
Endrin Ketone	LB007241	mg/kg	0.1	<0.1	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB007241	%	-	99%	107%

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB007241	mg/kg	0.1	<0.1	78%	102%	118%
Acenaphthylene	LB007241	mg/kg	0.1	<0.1	42%	99%	113%
Acenaphthene	LB007241	mg/kg	0.1	<0.1	54%	112%	128%
Fluorene	LB007241	mg/kg	0.1	<0.1	83%	NA	NA
Phenanthrene	LB007241	mg/kg	0.1	<0.1	67%	108%	117%
Anthracene	LB007241	mg/kg	0.1	<0.1	33%	108%	117%
Fluoranthene	LB007241	mg/kg	0.1	<0.1	2%	107%	78%
Pyrene	LB007241	mg/kg	0.1	<0.1	2%	111%	85%
Benzo(a)anthracene	LB007241	mg/kg	0.1	<0.1	5%	NA	NA
Chrysene	LB007241	mg/kg	0.1	<0.1	4%	NA	NA
Benzo(b)fluoranthene	LB007241	mg/kg	0.1	<0.1	3%	NA	NA
Benzo(k)fluoranthene	LB007241	mg/kg	0.1	<0.1	33%	NA	NA

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN420 (continued)**

				MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzo(a)pyrene	LB007241	mg/kg	0.1	<0.1	42%	110%	98%
Indeno(1,2,3-cd)pyrene	LB007241	mg/kg	0.1	<0.1	45%	NA	NA
Dibenzo(a&h)anthracene	LB007241	mg/kg	0.1	<0.1	7%	NA	NA
Benzo(ghi)perylene	LB007241	mg/kg	0.1	<0.1	43%	NA	NA
Total PAH (Vic EPA)	LB007241	mg/kg	0.8	<0.8	80%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB007241	%	-	97%	0 - 2%	96%	97%
2-fluorobiphenyl (Surrogate)	LB007241	%	-	96%	0 - 2%	100%	103%
d14-p-terphenyl (Surrogate)	LB007241	%	-	115%	7 - 18%	115%	118%

PCBs in Soil **Method: ME-(AU)-[ENV]AN400/AN420**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Arochlor 1016	LB007241	mg/kg	0.1	<0.1	NA
Arochlor 1221	LB007241	mg/kg	0.1	<0.1	NA
Arochlor 1232	LB007241	mg/kg	0.1	<0.1	NA
Arochlor 1242	LB007241	mg/kg	0.1	<0.1	NA
Arochlor 1248	LB007241	mg/kg	0.1	<0.1	NA
Arochlor 1254	LB007241	mg/kg	0.1	<0.1	NA
Arochlor 1260	LB007241	mg/kg	0.1	<0.1	114%
Arochlor 1262	LB007241	mg/kg	0.1	<0.1	NA
Arochlor 1268	LB007241	mg/kg	0.1	<0.1	NA
Total PCBs (Arochlors)	LB007241	mg/kg	0.9	<0.9	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB007241	%	-	99%	111%

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest **Method: ME-(AU)-[ENV]AN040/AN320**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB007353	mg/kg	3	<3	5 - 13%	102%	
Cadmium, Cd	LB007353	mg/kg	0.3	<0.3	0 - 3%	103%	
Chromium, Cr	LB007353	mg/kg	0.3	<0.3	0 - 1%	100%	89%
Copper, Cu	LB007353	mg/kg	0.5	<0.5	0 - 2%	101%	90%
Lead, Pb	LB007353	mg/kg	1	<1	1%	102%	87%
Nickel, Ni	LB007353	mg/kg	0.5	<0.5	0%	101%	89%
Zinc, Zn	LB007353	mg/kg	0.5	<0.5	0 - 1%	101%	91%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

TRH (Total Recoverable Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN403**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB007241	mg/kg	20	<20	0%	113%	125%
TRH C15-C28	LB007241	mg/kg	50	<50	35%	93%	110%
TRH C29-C36	LB007241	mg/kg	50	<50	8 - 31%	95%	68%

VOC's in Soil **Method: ME-(AU)-[ENV]AN433/AN434**

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB007242	mg/kg	0.1	<0.1	0%	101%	105%
Toluene	LB007242	mg/kg	0.1	<0.1	0%	104%	112%
Ethylbenzene	LB007242	mg/kg	0.1	<0.1	0%	103%	102%
m/p-xylene	LB007242	mg/kg	0.2	<0.2	0%	104%	102%
o-xylene	LB007242	mg/kg	0.1	<0.1	0%	100%	100%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB007242	%	-	99%	1 - 2%	98%	101%
d4-1,2-dichloroethane (Surrogate)	LB007242	%	-	97%	0 - 1%	98%	100%
d8-toluene (Surrogate)	LB007242	%	-	103%	0%	100%	101%
Bromofluorobenzene (Surrogate)	LB007242	%	-	105%	1 - 2%	104%	108%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total BTEX*	LB007242	mg/kg	-	0	NA	NA	NA
Total Xylenes*	LB007242	mg/kg	0.3	<0.3	0%	NA	NA

Volatile Petroleum Hydrocarbons in Soil **Method: ME-(AU)-[ENV]AN433/AN434**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C9	LB007242	mg/kg	20	<20	0%	74%	83%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Trifluorotoluene (Surrogate)	LB007242	%	-	88%	1 - 14%	94%	90%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analsysis by ASS or ICP as per USEPA Method 200.8.
AN088	Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
AN234	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with diffential polarity of the elluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	This analysis is not covered by the scope of accreditation.
^	Performed by outside laboratory.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Emma Coleman
Client	Coffey Environments Pty Ltd
Address	Lot 101, 19 Warabrook Blvd Warabrook NSW 2304
Telephone	02 4016 2300
Facsimile	02 4016 2380
Email	emma_coleman@coffey.com
Project	**ENAUWARA04216AA**
Order Number	**49615-49616**
Samples	11

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE102630 R0
Report Number	0000010181
Date Reported	24/10/2011 8:28:21PM
Date Received	18 Oct 2011

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

No respirable fibres detected using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

PAH - The Limit of Reporting (LOR) has been raised due to interferences from the sample matrix.

SIGNATORIES

Dong Liang
Inorganics Metals Team Leader

Huong Crawford
Laboratory Manager

Ly Kim Ha
Organics Supervisor

Ravee Sivasubramaniam
Hygienist

ANALYTICAL REPORT

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE102630.003	TP03 0.1-0.2	Soil		14 Oct 2011	No Asbestos Found Organic Fibres Detected	<0.01
SE102630.004	TP04 0.4-0.5	Soil	50g Soil,rocks	14 Oct 2011	No Asbestos Found Organic Fibres Detected	<0.01
SE102630.008	SP1-1	Soil	66g Soil,rocks	14 Oct 2011	No Asbestos Found Organic Fibres Detected	<0.01

ANALYTICAL REPORT

SE102630 R0

RESULTS

Fibre ID in bulk materials — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE102630.010	A2	Other	60x40x4mm Cement sheet fragments	14 Oct 2011	Amosite & Chrysotile Asbestos Detected	
SE102630.011	A3	Other	60x25x3mm Cement sheet fragments	14 Oct 2011	No Asbestos Detected Organic Fibres Detected	

METHOD SUMMARY

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METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed Not Required
Crocidolite	-	Blue Asbestos	*	-	Not Accredited

AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:
"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Sampled by the client

Where reported: 'Asbestos Detected':
Asbestos detected by polarized light microscopy, including dispersion staining

Where reported: 'No Asbestos Found':
No Asbestos Found by polarized light microscopy, including dispersion staining

Where reported: 'UMF Detected':
Mineral fibres of unknown type detected by polarized light microscopy, including dispersion staining.
Confirmation by another independent analytical technique may be necessary

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos-containing bulk materials using polarised light microscopy.
This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

STATEMENT OF QA/QC PERFORMANCE AGAINST DATA QUALITY OBJECTIVES

SE102630 R0

CLIENT DETAILS

Contact	Emma Coleman
Client	Coffey Environments Pty Ltd
Address	Lot 101, 19 Warabrook Blvd Warabrook NSW 2304
Telephone	02 4016 2300
Facsimile	02 4016 2380
Email	emma_coleman@coffey.com
Project	**ENAUWARA04216AA**
Order Number	**49615-49616**
Samples	11

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE102630 R0
Report Number	0000010180
Date Reported	24 Oct 2011

COMMENTS

All the laboratory data for each environmental matrix was compared to the SGS Environmental Services' stated data quality objectives (DQO).
Comments arising from the comparison were made and are reported below.
The data relating to sampling was taken from the chain of custody document and was supplied by the client.
This QA/QC statement must be read in conjunction with the referenced analytical report.
The statement and the analytical report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	16 Items
	TRH (Total Recoverable Hydrocarbons) in Soil	1 Item

SAMPLE SUMMARY

Sample counts by matrix	9 Soils, 2 Materials	Type of documentation received	COC
Date documentation received	18/10/2011	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	20°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

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HOLDING TIMES

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field sampling guide for containers and holding time" (Ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

The extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Fibre ID in bulk materials Method: ME-(AU)-[ENV]AN602								
TP03 0.1-0.2	SE102630.003	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
SP1-1	SE102630.008	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
A2	SE102630.010	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
A3	SE102630.011	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
Fibre Identification in soil Method: ME-(AU)-[ENV]AN602								
TP03 0.1-0.2	SE102630.003	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
SP1-1	SE102630.008	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
A2	SE102630.010	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
A3	SE102630.011	LB007307	14 Oct 2011	18 Oct 2011	13 Oct 2012	20 Oct 2011	13 Oct 2012	24 Oct 2011
Mercury in Soil Method: ME-(AU)-[ENV]AN312								
TP01 0.1-0.2	SE102630.001	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
SP1-1	SE102630.008	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
QC2	SE102630.009	LB007353	14 Oct 2011	18 Oct 2011	11 Nov 2011	17 Oct 2011	11 Nov 2011	21 Oct 2011
Moisture Content Method: ME-(AU)-[ENV]AN234								
TP01 0.1-0.2	SE102630.001	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
SP1-1	SE102630.008	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
QC2	SE102630.009	LB007245	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	24 Oct 2011	21 Oct 2011
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420								
TP01 0.1-0.2	SE102630.001	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
SP1-1	SE102630.008	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
QC2	SE102630.009	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011

HOLDING TIME SUMMARY

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HOLDING TIMES

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field sampling guide for containers and holding time" (Ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

The extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420								
TP01 0.1-0.2	SE102630.001	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
SP1-1	SE102630.008	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
QC2	SE102630.009	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420								
TP01 0.1-0.2	SE102630.001	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
SP1-1	SE102630.008	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
QC2	SE102630.009	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320								
TP01 0.1-0.2	SE102630.001	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
SP1-1	SE102630.008	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
QC2	SE102630.009	LB007353	14 Oct 2011	18 Oct 2011	11 Apr 2012	17 Oct 2011	11 Apr 2012	21 Oct 2011
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403								
TP01 0.1-0.2	SE102630.001	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
SP1-1	SE102630.008	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
QC2	SE102630.009	LB007241	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011

HOLDING TIME SUMMARY

SE102630 R0

HOLDING TIMES

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field sampling guide for containers and holding time” (Ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

The extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434								
TP01 0.1-0.2	SE102630.001	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
SP1-1	SE102630.008	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
QC2	SE102630.009	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434								
TP01 0.1-0.2	SE102630.001	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP02 0.1-0.2	SE102630.002	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP03 0.1-0.2	SE102630.003	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP04 0.4-0.5	SE102630.004	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP05 0.5-0.6	SE102630.005	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP06 0.1-0.2	SE102630.006	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
TP07 0.1-0.2	SE102630.007	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
SP1-1	SE102630.008	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011
QC2	SE102630.009	LB007242	14 Oct 2011	18 Oct 2011	28 Oct 2011	19 Oct 2011	28 Nov 2011	24 Oct 2011

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420					
Tetrachloro-m-xylene (TCMX) (Surrogate)	TP03 0.1-0.2	SE102630.003	%	60 - 130%	97
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	98
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	101
	SP1-1	SE102630.008	%	60 - 130%	115
	QC2	SE102630.009	%	60 - 130%	95
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420					
2-fluorobiphenyl (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	92
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	92
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	90
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	92
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	80
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	94
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	98
	SP1-1	SE102630.008	%	60 - 130%	90
	QC2	SE102630.009	%	60 - 130%	88
d14-p-terphenyl (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	104
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	110
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	118
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	108
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	120
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	118
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	120
	SP1-1	SE102630.008	%	60 - 130%	122
	QC2	SE102630.009	%	60 - 130%	114
d5-nitrobenzene (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	104
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	106
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	106
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	108
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	80
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	104
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	104
	SP1-1	SE102630.008	%	60 - 130%	102
	QC2	SE102630.009	%	60 - 130%	106
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420					
Tetrachloro-m-xylene (TCMX) (Surrogate)	TP03 0.1-0.2	SE102630.003	%	60 - 130%	97
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	98
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	101
	SP1-1	SE102630.008	%	60 - 130%	115
	QC2	SE102630.009	%	60 - 130%	95
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434					
Bromofluorobenzene (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	105
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	106
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	102
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	104
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	102
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	105
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	104
	SP1-1	SE102630.008	%	60 - 130%	103
	QC2	SE102630.009	%	60 - 130%	103
d4-1,2-dichloroethane (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	96
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	97
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	96
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	97
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	96

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Continued... VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434					
d4-1,2-dichloroethane (Surrogate)	TP06 0.1-0.2	SE102630.006	%	60 - 130%	99
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	96
	SP1-1	SE102630.008	%	60 - 130%	95
	QC2	SE102630.009	%	60 - 130%	95
d8-toluene (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	93
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	94
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	94
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	94
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	94
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	94
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	94
	SP1-1	SE102630.008	%	60 - 130%	95
	QC2	SE102630.009	%	60 - 130%	94
Dibromofluoromethane (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	95
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	95
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	94
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	95
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	94
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	96
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	93
	SP1-1	SE102630.008	%	60 - 130%	94
	QC2	SE102630.009	%	60 - 130%	94
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434					
Trifluorotoluene (Surrogate)	TP01 0.1-0.2	SE102630.001	%	60 - 130%	89
	TP02 0.1-0.2	SE102630.002	%	60 - 130%	101
	TP03 0.1-0.2	SE102630.003	%	60 - 130%	91
	TP04 0.4-0.5	SE102630.004	%	60 - 130%	82
	TP05 0.5-0.6	SE102630.005	%	60 - 130%	89
	TP06 0.1-0.2	SE102630.006	%	60 - 130%	91
	TP07 0.1-0.2	SE102630.007	%	60 - 130%	97
	SP1-1	SE102630.008	%	60 - 130%	91
	QC2	SE102630.009	%	60 - 130%	98

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, which is typically 2.5 times the statistically determined method detection limit (MDL).
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Units	Control LOR	BLK MB
Mercury in Soil Method: ME-(AU)-[ENV]AN312			
LB007353.001			
Mercury	mg/kg	0.05	<0.05
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420			
LB007241.001			
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	99
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420			
LB007241.001			
Naphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	97
2-fluorobiphenyl (Surrogate)	%	-	96
d14-p-terphenyl (Surrogate)	%	-	115
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420			
LB007241.001			
Arochlor 1016	mg/kg	0.1	<0.1
Arochlor 1221	mg/kg	0.1	<0.1
Arochlor 1232	mg/kg	0.1	<0.1
Arochlor 1242	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, which is typically 2.5 times the statistically determined method detection limit (MDL).
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Units	Control LOR	BLK MB
Continued... PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420			
LB007241.001			
Arochlor 1248	mg/kg	0.1	<0.1
Arochlor 1254	mg/kg	0.1	<0.1
Arochlor 1260	mg/kg	0.1	<0.1
Arochlor 1262	mg/kg	0.1	<0.1
Arochlor 1268	mg/kg	0.1	<0.1
Total PCBs (Arochlors)	mg/kg	0.9	<0.9
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	99
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320			
LB007353.001			
Arsenic, As	mg/kg	3	<3
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.3	<0.3
Copper, Cu	mg/kg	0.5	<0.5
Lead, Pb	mg/kg	1	<1
Nickel, Ni	mg/kg	0.5	<0.5
Zinc, Zn	mg/kg	0.5	<0.5
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403			
LB007241.001			
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	50	<50
TRH C29-C36	mg/kg	50	<50
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434			
LB007242.001			
Monocyclic Aromatic Hydrocarbons			
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	99
d4-1,2-dichloroethane (Surrogate)	%	-	97
d8-toluene (Surrogate)	%	-	103
Bromofluorobenzene (Surrogate)	%	-	105
Totals			
Total BTEX*	mg/kg	-	0
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434			
LB007242.001			
TRH C6-C9	mg/kg	20	<20
Surrogates			
Trifluorotoluene (Surrogate)	%	-	88

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Sample Name	SE102522A.021-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420						
LB007241.004						
Naphthalene	mg/kg	0.1	0.1	0.1	113	0
Acenaphthylene	mg/kg	0.1	0.8	0.8	43	0
Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
Fluorene	mg/kg	0.1	0.3	0.4	61	15
Phenanthrene	mg/kg	0.1	2.9	2.9	33	1
Anthracene	mg/kg	0.1	1.2	1.3	38	3
Fluoranthene	mg/kg	0.1	5.6	5.7	32	2
Pyrene	mg/kg	0.1	5.6	5.7	32	2
Benzo(a)anthracene	mg/kg	0.1	3.5	3.3	33	5
Chrysene	mg/kg	0.1	2.0	2.1	35	4
Benzo(b)fluoranthene	mg/kg	0.1	3.7	3.8	33	3
Benzo(k)fluoranthene	mg/kg	0.1	1.0	1.0	40	1
Benzo(a)pyrene	mg/kg	0.1	2.7	2.7	34	1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1.5	1.6	36	2
Dibenzo(a&h)anthracene	mg/kg	0.1	0.4	0.4	54	7
Benzo(ghi)perylene	mg/kg	0.1	1.7	1.7	36	1
Total PAH (Vic EPA)	mg/kg	0.8	32	33	32	1
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	98.0	100	30	2
2-fluorobiphenyl (Surrogate)	%	-	106.0	108	30	2
d14-p-terphenyl (Surrogate)	%	-	115.0	123	30	7
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403						
LB007241.004						
TRH C10-C14	mg/kg	20	<20	<20	200	0
TRH C15-C28	mg/kg	50	210	190	55	13
TRH C29-C36	mg/kg	50	290	270	48	8

		Sample Name	SE102630.001-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Mercury in Soil Method: ME-(AU)-[ENV]AN312						
LB007353.014						
Mercury	mg/kg	0.05	<0.05	<0.05	200	0
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320						
LB007353.014						
Arsenic, As	mg/kg	3	4	4	108	13
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	192	0
Chromium, Cr	mg/kg	0.3	11	11	33	1
Copper, Cu	mg/kg	0.5	13	13	34	2
Lead, Pb	mg/kg	1	14	14	37	1
Nickel, Ni	mg/kg	0.5	4.9	4.9	40	0
Zinc, Zn	mg/kg	0.5	98	98	31	0

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

	Sample Name		SE102630.004-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Moisture Content Method: ME-(AU)-[ENV]AN234						
LB007245.011						
% Moisture	%	0.5	12	15	34	22
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.015						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	<0.1	200	0
Toluene	mg/kg	0.1	<0.1	<0.1	200	0
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	95.0	94.0	50	1
d4-1,2-dichloroethane (Surrogate)	%	-	97.0	96.0	50	1
d8-toluene (Surrogate)	%	-	94.0	94.0	50	0
Bromofluorobenzene (Surrogate)	%	-	104.0	103.0	50	1
Totals						
Total BTEX*	mg/kg	-	0	0	200	NA
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.015						
TRH C6-C9	mg/kg	20	<20	<20	200	0
Surrogates						
Trifluorotoluene (Surrogate)	%	-	82	94	30	14

	Sample Name		SE102630.005-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420						
LB007241.016						
Naphthalene	mg/kg	0.1	3.2	1.4	34	78†
Acenaphthylene	mg/kg	0.1	3.9	2.6	33	42†
Acenaphthene	mg/kg	0.1	4.8	2.7	33	54†
Fluorene	mg/kg	0.1	10	4.3	31	83†
Phenanthrene	mg/kg	0.1	120	61	30	67†
Anthracene	mg/kg	0.1	29	21	30	33†
Fluoranthene	mg/kg	0.1	540	160	30	109†
Pyrene	mg/kg	0.1	480	140	30	108†
Benzo(a)anthracene	mg/kg	0.1	91	60	30	41†
Chrysene	mg/kg	0.1	71	48	30	39†
Benzo(b)fluoranthene	mg/kg	0.1	96	73	30	28
Benzo(k)fluoranthene	mg/kg	0.1	38	27	30	33†
Benzo(a)pyrene	mg/kg	0.1	100	67	30	42†
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	52	33	30	45†
Dibenzo(a&h)anthracene	mg/kg	0.1	7.6	4.7	32	46†
Benzo(ghi)perylene	mg/kg	0.1	56	36	30	43†
Total PAH (Vic EPA)	mg/kg	0.8	1700	740	30	80†

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Sample Name	SE102630.005-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Continued... PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420						
LB007241.016						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	80	80	30	0
2-fluorobiphenyl (Surrogate)	%	-	80	80	30	0
d14-p-terphenyl (Surrogate)	%	-	120	100	30	18

RPD failed acceptance criteria due to sample heterogeneity.

TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403

LB007241.016

TRH C10-C14	mg/kg	20	<20	<20	200	0
TRH C15-C28	mg/kg	50	2000	1400	33	**35†**
TRH C29-C36	mg/kg	50	1600	1200	34	31

RPD failed acceptance criteria due to sample heterogeneity.

		Sample Name	SE102630.009-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Mercury in Soil Method: ME-(AU)-[ENV]AN312						
LB007353.023						
Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320

LB007353.023

Arsenic, As	mg/kg	3	4	4	106	5
Cadmium, Cd	mg/kg	0.3	0.4	0.4	98	3
Chromium, Cr	mg/kg	0.3	21	21	31	0
Copper, Cu	mg/kg	0.5	28	28	32	0
Lead, Pb	mg/kg	1	30	30	33	1
Nickel, Ni	mg/kg	0.5	7.8	7.9	36	0
Zinc, Zn	mg/kg	0.5	180	180	30	1

		Sample Name	SE102637.003-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Moisture Content Method: ME-(AU)-[ENV]AN234						
LB007245.022						
% Moisture	%	0.5	20.4081632653061	20	32	0

		Sample Name	SE102641.001-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.027						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	0	<0.1	200	0
Toluene	mg/kg	0.1	0	<0.1	200	0
Ethylbenzene	mg/kg	0.1	0	<0.1	200	0
m/p-xylene	mg/kg	0.2	0	<0.2	200	0
o-xylene	mg/kg	0.1	0	<0.1	200	0

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Sample Name	SE102641.001-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Continued... VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.027						
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	96	98.0	50	2
d4-1,2-dichloroethane (Surrogate)	%	-	96	96.0	50	0
d8-toluene (Surrogate)	%	-	101	101.0	50	0
Bromofluorobenzene (Surrogate)	%	-	104	106.0	50	2
Totals						
Total BTEX*	mg/kg	-	0	0	200	NA
Total Xylenes*	mg/kg	0.3	0	<0.3	200	0
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.028						
TRH C6-C9	mg/kg	20	0	<20	200	0
Surrogates						
Trifluorotoluene (Surrogate)	%	-	92	93	30	1

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022).
For more information refer to the footnotes in the concluding page of the report.
Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	LCS STD			
Parameter	Units	LOR	Result	Expected Result	Criteria %	Recovery %
Mercury in Soil Method: ME-(AU)-[ENV]AN312						
LB007353.002						
Mercury	mg/kg	0.05	0.18	0.2	70 - 130	92
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420						
LB007241.002						
Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	118
Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	114
Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	95
Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	109
Endrin	mg/kg	0.2	0.2	0.2	60 - 140	110
p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	94
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	107	100	60 - 140	107
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420						
LB007241.002						
Naphthalene	mg/kg	0.1	3.4	3.37	60 - 140	102
Acenaphthylene	mg/kg	0.1	3.3	3.37	60 - 140	99
Acenaphthene	mg/kg	0.1	3.8	3.37	60 - 140	112
Phenanthrene	mg/kg	0.1	3.7	3.37	60 - 140	108
Anthracene	mg/kg	0.1	3.6	3.37	60 - 140	108
Fluoranthene	mg/kg	0.1	3.6	3.37	60 - 140	107
Pyrene	mg/kg	0.1	3.8	3.37	60 - 140	111
Benzo(a)pyrene	mg/kg	0.1	3.7	3.37	60 - 140	110
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	96	100	60 - 140	96
2-fluorobiphenyl (Surrogate)	%	-	100	100	60 - 140	100
d14-p-terphenyl (Surrogate)	%	-	115	100	60 - 140	115
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420						
LB007241.002						
Arochlor 1260	mg/kg	0.1	0.5	0.4	60 - 140	114
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	111	100	60 - 140	111
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320						
LB007353.002						
Arsenic, As	mg/kg	3	51	50	80 - 120	102
Cadmium, Cd	mg/kg	0.3	52	50	80 - 120	103
Chromium, Cr	mg/kg	0.3	50	50	80 - 120	100
Copper, Cu	mg/kg	0.5	50	50	80 - 120	101
Lead, Pb	mg/kg	1	51	50	80 - 120	102
Nickel, Ni	mg/kg	0.5	50	50	80 - 120	101
Zinc, Zn	mg/kg	0.5	51	50	80 - 120	101
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403						
LB007241.002						
TRH C10-C14	mg/kg	20	45	40	60 - 140	113
TRH C15-C28	mg/kg	50	<50	40	60 - 140	93
TRH C29-C36	mg/kg	50	<50	40	60 - 140	95

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022).
For more information refer to the footnotes in the concluding page of the report.
Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	LCS STD			
Parameter	Units	LOR	Result	Expected Result	Criteria %	Recovery %
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.002						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	2.3	2.27	60 - 140	101
Toluene	mg/kg	0.1	2.4	2.27	60 - 140	104
Ethylbenzene	mg/kg	0.1	2.3	2.27	60 - 140	103
m/p-xylene	mg/kg	0.2	4.7	4.54	60 - 140	104
o-xylene	mg/kg	0.1	2.3	2.27	60 - 140	100
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	98.0	100	60 - 140	98
d4-1,2-dichloroethane (Surrogate)	%	-	98.0	100	60 - 140	98
d8-toluene (Surrogate)	%	-	100.0	100	60 - 140	100
Bromofluorobenzene (Surrogate)	%	-	104.0	100	60 - 140	104
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.002						
TRH C6-C9	mg/kg	20	<20	23	60 - 140	74

Matrix spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of the report. Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	MS			
Parameter	Units	LOR	Result	Original Result	Spike Added	Recovery %
Mercury in Soil Method: ME-(AU)-[ENV]AN312						
LB007353.004						
Mercury	mg/kg	0.05	0.16	<0.01	0.2	81
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420						
LB007241.007						
Naphthalene	mg/kg	0.1	4.0	<0.1	3.37	118
Acenaphthylene	mg/kg	0.1	4.1	0.3	3.37	113
Acenaphthene	mg/kg	0.1	4.3	<0.1	3.37	128
Fluorene	mg/kg	0.1	<0.1	0.1	-	NA
Phenanthrene	mg/kg	0.1	5.2	1.2	3.37	117
Anthracene	mg/kg	0.1	4.5	0.6	3.37	117
Fluoranthene	mg/kg	0.1	5.5	2.9	3.37	78
Pyrene	mg/kg	0.1	6.1	3.2	3.37	85
Benzo(a)anthracene	mg/kg	0.1	<0.1	1.8	-	NA
Chrysene	mg/kg	0.1	<0.1	1.1	-	NA
Benzo(b)fluoranthene	mg/kg	0.1	<0.1	2.1	-	NA
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.4	-	NA
Benzo(a)pyrene	mg/kg	0.1	4.8	1.4	3.37	98
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.7	-	NA
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	0.2	-	NA
Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.8	-	NA
Total PAH (Vic EPA)	mg/kg	0.8	38	16	-	NA
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	97	97.0	100	97
2-fluorobiphenyl (Surrogate)	%	-	103	103.0	100	103
d14-p-terphenyl (Surrogate)	%	-	118	116.0	100	118
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320						
LB007353.004						
Chromium, Cr	mg/kg	0.3	49	4.6	50	89
Copper, Cu	mg/kg	0.5	47	2.5	50	90
Lead, Pb	mg/kg	1	45	1	50	87
Nickel, Ni	mg/kg	0.5	48	3.5	50	89
Zinc, Zn	mg/kg	0.5	51	6.0	50	91
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403						
LB007241.006						
TRH C10-C14	mg/kg	20	50	<20	40	125
TRH C15-C28	mg/kg	50	71	<50	40	110
TRH C29-C36	mg/kg	50	<50	<50	40	68
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.004						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	2.4	<0.1	2.27	105
Toluene	mg/kg	0.1	2.6	<0.1	2.27	112
Ethylbenzene	mg/kg	0.1	2.3	<0.1	2.27	102
m/p-xylene	mg/kg	0.2	4.6	<0.2	4.54	102
o-xylene	mg/kg	0.1	2.3	<0.1	2.27	100
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	101.0	97.0	100	101
d4-1,2-dichloroethane (Surrogate)	%	-	100.0	96.0	100	100
d8-toluene (Surrogate)	%	-	101.0	102.0	100	101
Bromofluorobenzene (Surrogate)	%	-	108.0	103.0	100	108

Matrix spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of the report. Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	MS			
Parameter	Units	LOR	Result	Original Result	Spike Added	Recovery %
Continued... VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.004						
Totals						
Total BTEX*	mg/kg	-	14	0	-	NA
Total Xylenes*	mg/kg	0.3	6.9	<0.3	-	NA
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB007242.005						
TRH C6-C9	mg/kg	20	<20	<20	23	83
Surrogates						
Trifluorotoluene (Surrogate)	%	-	90	75.0	-	90

Matrix spike duplicates are calculated as relative percent difference using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The original result is the analyte concentration of the matrix spike and the replicate result is the analyte concentration of the matrix spike duplicate.
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

No Matrix Spike Duplicates were required for this job.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	NATA Accreditation does not cover this analysis.
^	Performed by outside laboratory.
LOR	Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
NA	The sample was not analysed for this analyte

Samples analysed as received.
Solid samples expressed on a dry weight basis.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

Appendix D
Data Validation Report

DATA VALIDATION REPORT – ENAUWARA04216AA Maroba Apartments

Lab Batches: SE102630

DATA COMPLETENESS

Field Considerations

	Yes / No	Comment
Were all critical locations sampled?	Yes	
Were all critical depths sampled?	Yes	
Were the SOPs appropriate and complied with?	Yes	
Was the sampler adequately experienced?	Yes	
Was the field documentation complete?	Yes	
Is a copy of the signed chain of custody form for each batch of samples included?	Yes	

Laboratory Considerations

	Yes / No	Comment
Were all critical samples analysed according to sampling plan?	Yes	
Were analytes analysed as per sampling plan?	Yes	
Were the laboratory methods appropriate?	Yes	
Were the laboratory methods adopted NATA endorsed?	Yes	
Was the NATA Seal on the laboratory reports?	Yes	
Were the laboratory reports signed by an authorised person?	Yes	
Were the laboratory PQLs below the criteria?	Yes	

Was sample documentation complete?	Yes	
Were sample holding times complied with?	Yes	

COMPLETENESS CONCLUSION

	Yes / No	Comment
Was data adequately complete?	Yes	

DATA COMPARABILITY

Field considerations

	Yes / No	Comment
Was there more than one sampling round?	No	
Were the same sampling methodology and SOPs used for all sampling?	Yes	
Was all sampling undertaken by the same sampler?	Yes	
Were sample containers, preservation, filtering the same?	Yes	
Could climatic conditions (temperature, rainfall, wind) have influenced data comparability?	No	It is not considered that climatic conditions would affect the data comparability.
Were the same types of samples collected (filtered, size fractions etc) for each media?	Yes	

DATA VALIDATION REPORT – ENAUWARA04216AA Maroba Apartments

Lab Batches: SE102630

Laboratory Considerations

	Yes / No	Comment
Were the same analytical methods used (including clean up)?	Yes	
Were the PQLs the same?	Yes	
Were the same laboratories used?	Yes	
Were the units reported the same?	Yes	

COMPARABILITY CONCLUSION

	Yes / No	Comment
Was data adequately comparable?	Yes	

DATA REPRESENTATIVENESS

Field Considerations

	Yes / No	Comment
Was appropriate media sampled?	Yes	
Was media identified sampled?	Yes	
Were the samples properly and adequately preserved? This includes keeping the samples chilled, where applicable.	Yes	
Were the samples in proper custody between the field and reaching the laboratory?	Yes	
Were the samples received by the laboratory in good condition?	Yes	

DATA VALIDATION REPORT – ENAUWARA04216AA Maroba Apartments

Lab Batches: SE102630

Laboratory Considerations

	Yes / No	Comment
Were all samples analysed according to SAQP?	NA	No SAQP was prepared for this assessment

REPRESENTATIVENESS CONCLUSION

	Yes / No	Comment
Was data adequately representative?	Yes	

DATA PRECISION AND ACCURACY

Field considerations

	Yes / No	Comment
Were the SOPs appropriate and complied with?	Yes	Based on available Coffey Environments Standard Operating Procedures.

Lab Batches: SE102630

Table D1: Laboratory Considerations for Soil

	TPH C_{10}-C_{36}	BTEX/TPH C_6-C_9	PAH Meta ls		OCPs	PCBs	Asbestos
Primary 8		8	8	8	5	5	6
Field QA/QC							
Intralab Dup	1, 12%	1, 12%	1, 12%	1, 12%	1, 20%	1, 20%	0
Interlab Dup	0 0		0	0	0	0	0
Trip Spike	NA 0		NA	NA	NA	NA	
Trip Blank	NA 0		NA	NA	NA	NA	
Wash Blanks	0 0		0	0	0	0	0
LAB QA/QC							
Lab Blanks	1 1		1	1	1	1	0
Lab Dups	2	2	2	2	0	0	0
Matrix Spikes	1 1		1	1	0	0	0
Lab Control	1 1		1	1	1	1	0
Surrogate 0		5	3	0	1	1	0

DATA VALIDATION REPORT – ENAUWARA04216AA Maroba Apartments

Lab Batches: SE102630

	Yes / No	Comment
Field QA/QC		
Were an adequate number of field duplicates analysed?	Yes	No triplicate (inter-laboratory) samples were tested.
Were the RPDs of the field duplicates within control limits?	No	RPD for lead at 57%, due to sample heterogeneity. RPDs for numerous PAH compounds between 108% and 140%, due to concentrations being close to the detection limit.
Were an adequate number of trip blanks analysed?	No None	tested
Were the trip blanks free of contaminants	NA	
Were an adequate number of trip spikes analysed?	No None	tested
Were the trip spikes recoveries within control limits?	NA	
Were an adequate number of wash blanks analysed?	Yes	No wash blanks required as no sampling equipment other than excavator bucket used.
Were the wash blanks free of contaminants?	NA	
Lab QA/QC		
Were an adequate number of laboratory blank samples analysed?	Yes	
Were the blanks free of contaminants?	Yes	
Were an adequate number of laboratory matrix spikes and laboratory control samples analysed?	Yes	
Were an adequate number of surrogate spike samples analysed?	Yes	

Were the spikes recoveries within control limits?	Yes	
Were an adequate number of laboratory duplicates analysed?	Yes	
Were the laboratory duplicate RPDs within control limits?	Yes	Numerous PAH compounds with RPDs between 33% and 109%, and TPH C15-C28 RPD of 35% due to sample heterogeneity.

PRECISION AND ACCURACY CONCLUSION

	Yes / No	Comment
Was soil data adequately precise?	Yes	
Was soil data adequately accurate?	Yes	
Was water data adequately precise?	NA	
Was water data adequately accurate?	NA	

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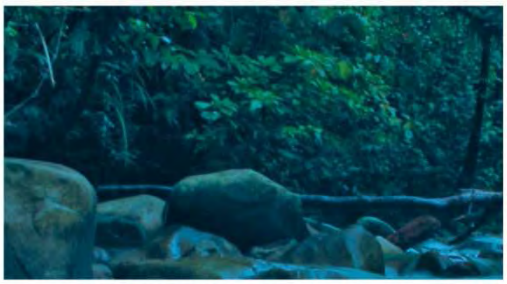
REMEDIAL ACTION PLAN FOR THE MAROBA APARTMENTS PROJECT CORNER OF EDITH AND HIGH STREETS, WARATAH NSW

EJE Architecture Pty Ltd

ENAUWARA04216AB-R01

18 November 2011



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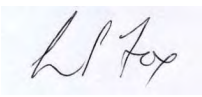
EJE Architecture Pty Ltd

ENAUWARA04216AB-R01
18 November 2011

Written/Submitted by:

Damien Hendrickx
Environmental Scientist

Reviewed/Approved by:



Laurie Fox
Principal Environmental Geologist

Coffey Environments Australia Pty Ltd ABN 65 140 765 902
19 Warabrook Boulevard Warabrook NSW 2304 Australia

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SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

18 November 2011

EJE Architecture Pty Ltd
412 King Street
NEWCASTLE NSW 2300

Attention: Glen Spicer

Dear Glen

RE: REMEDIAL ACTION PLAN FOR THE MAROBA APARTMENTS PROJECT

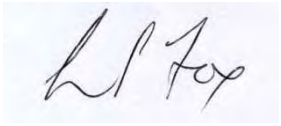
CORNER OF EDITH AND HIGH STREETS, WARATAH NSW

Coffey Environments Australia Pty Ltd (Coffey) is pleased to provide this Remedial Action Plan (RAP) for the Maroba Apartments Project at Waratah, NSW.

We draw your attention to the enclosed sheet entitled “Important Information about your Coffey Environmental Report”, which must be read in conjunction with this report.

We trust that this document meets with your requirements at this time. If you require any further information regarding this document, please do not hesitate to contact Emma Coleman or the undersigned on (02) 4016 2300.

For and on behalf of Coffey Environments Australia Pty Ltd



Laurie Fox

Principal Environmental Geologist

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Important Information About Your Coffey Environmental Report

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Figure 1: Site Locality Plan

Figure 2: Sampling Location Plan

Figure 3: Soil Contamination

ABBREVIATIONS

AHD	Australian Height Datum
C6-C36	Hydrocarbon chainlength fraction
Bgs	below ground surface
ID	Identification
µg/L	micrograms per litre
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NSW DEC	New South Wales Department of Environment and Conservation
NSW DECC	New South Wales Department of Environment and Climate Change
NSW DECCW	New South Wales Department of Environment, Climate Change and Water
NSW EPA	Environment Protection Authority of New South Wales
NSW OEH	New South Wales Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbon
PID	Photoionisation Detector
Ppm	parts per million
TPH	Total Petroleum Hydrocarbon

EXECUTIVE SUMMARY

EJE Architecture Pty Ltd (Caltex) contracted Coffey Environments Australia Pty Ltd (Coffey) to prepare a Remediation Action Plan (RAP) for the Maroba Apartments Project, located on the corner of Edith and High Streets, Waratah NSW.

The key objective of the RAP was to provide guidance on the remediation and validation activities to be undertaken in order to render the site suitable for the proposed development (seniors living apartment complex).

The proposed remediation strategy for the site will involve the following works:

- Step 1 – Emu-picking of visible asbestos fragments from the surface of the site;
- Step 2 – Delineation of the previously identified restricted and hazardous waste hot-spots through test pitting and soil sampling;
- Step 3 – Bulk excavation of the fill materials and disposal to appropriately licensed disposal facilities.

Following remedial works, the resulting excavations will be visually inspected to confirm that, visually, the fill materials have been removed to the extent practical. Soil samples will also be taken for validation purposes and compared to adopted residential soil investigation levels. A site validation report will be prepared, documenting findings and providing an assessment of the suitability of the site for the proposed development.

During remediation and validation works, appropriate site controls are to be applied at the site to ensure protection of human and environmental health. In additional, occupational health and safety is to be implemented and followed by site workers and visitors to the site.

1 INTRODUCTION

1.1 Background

This document contains a Remedial Action Plan (RAP) prepared by Coffey Environments Australia Pty Ltd (Coffey) for the Maroba Apartments Project located on the corner of Edith and High Streets, Waratah NSW (the site). The location of the site is shown on Figure 1.

The RAP was commissioned by EJE Architecture Pty Ltd (EJE) in response to a Coffey fee proposal for site remediation works (Reference ENAUWARA04216AA-L01 dated 11 November 2011). We understand that the proposed development will comprise the construction of a senior's living apartment complex, including construction of a basement.

Coffey previously undertook a contamination assessment at the site. The findings are summarised in Section 3 (below). The assessment identified that contaminated fill was present at a number of locations across the site.

Based on the findings of Coffey's previous assessment, remediation works will need to be undertaken in order to render the site suitable for the proposed development. This RAP has therefore been prepared to guide the remedial activities.

This RAP has been written in accordance with the relevant sections of the NSW OEH (2011) *Guidelines for Contaminants Reporting on Contaminated Sites*. This RAP must be read in conjunction with the enclosed sheet entitled "Important Information about your Coffey Environmental Report", which can be found attached to this report.

1.2 Objectives

The objective of the RAP is to provide guidance on the remediation and validation activities to be undertaken in order to render the site suitable for the proposed development (seniors living apartment complex).

1.3 RAP Requirements

The NSW OEH (2011) *Guidelines for Contaminants Reporting on Contaminated Sites* provides requirements that are to be considered in the preparation of RAPs. As such, this document addresses the following requirements:

- Remediation goals;
- Discussion of the extent of remediation required;
- Discussion of possible remediation options;
- Rationale for selecting the preferred remedial option;
- Proposed validation testing;
- Contingency plans for unexpected findings; and
- Health, Safety, Security and Environmental (HSSE) requirements.

2 SITE SUMMARY

2.1 Site Identification

The site locality is shown in Figure 1. A site layout plan is presented in Figure 2. A summary of site identification is shown in Table 1.

TABLE 1: SUMMARY OF SITE IDENTIFICATION

STREET ADDRESS	Cnr Edith and High Streets, Waratah
AREA	3,008m^2
TITLE IDENTIFIERS	Lot 1 in DP 1131868
LOCAL GOVERNMENT AREA	Newcastle City Council
PARISH	Newcastle
COUNTY	Northumberland
GRID CO-ORDINATES (AUST. MAP GRID)	32°54' 12" S 151°43' 12" E
SURROUNDING LAND	The site is bounded by: • Existing Maroba Apartments (seniors living) to the north; • Edith Street, followed by residential properties to the east; • High Street, followed by vacant land to the south; and • Vacant land which appears to be a garden area for the Maroba Nursing home to the west.

2.2 Topography and Drainage

The Wallsend 1:25,000 Topographic Map shows the site lies at an elevation range between 30m and 40m above Australian Height Datum (AHD). The site is located on the side slopes of a northeast facing hill that slopes down towards the north-east.

Surface water is considered to follow the site topography, and flow to the northeast. Surface water would infiltrate into the site soils, and flow into the municipal stormwater system located on Edith Street. Water collected in the stormwater drains at the rear of the site is likely to eventually discharge into Throsby Creek, which is the inferred nearest body of water located approximately 1.8km to the east of the site.

2.3 Local Geology

Reference to the 1:100000 scale Newcastle Regional Coalfield Geology Map indicates that the site is underlain by the Waratah Sandstone belonging to the Newcastle Coal Measures of Middle Permian age. These rocks typically weather to clayey sands and sandy clays. Sandstone was observed to outcrop at the southern end of the site.

2.4 Site Specific Geology

The general subsurface profile encountered during Coffey's Contamination Assessment is summarised in Table 2 (below)

TABLE 2: SUMMARY OF SUBSURFACE CONDITIONS

Material Description	Approximate Depth to Base of Material (m bgs)
FILL: Gravelly Sand, Sandy and Gravelly Clay and Sands with some anthropogenic material including tiles, bricks, concrete and metal	0.2 to 1.6m
RESIDUAL SOIL: Sandy CLAY, CLAY, Clayey SAND, medium to high plasticity, pale orange-brown, pale to dark grey, fine grained sand	0.8 to 2.5m
Weathered SANDSTONE (refusal)	0.2 to 1.7m

2.5 Hydrogeology and Groundwater Use

Based on observations of the site and nearby topography, the regional groundwater table beneath the site is estimated to be located at a depth of greater than 10m below ground surface (m bgs). Regional groundwater would be expected to flow east and eventually discharge to Throsby Creek.

Shallow discontinuous groundwater may occur following periods of heavy or prolonged rainfall. Perched groundwater was encountered during the geotechnical investigation in 2007 at depths ranging from 1.5m to 4.4m bgs.

Perched groundwater inflow was encountered in one location during the contamination assessment at approximately 0.3m depth during excavation.

3 PREVIOUS CONTAMINATION ASSESSMENT

Coffey undertook a contamination assessment at the site (Reference ENAUWARA04216AA-R01 dated 11 November 2011).

The objective of the work was to carry out further investigation to assess the extent and nature of fill material, and provide recommendations on site suitability, and remediation and/or management of contamination (if required).

In order to achieve the objectives, the following scope of work was carried out:

- Excavation of eight test pits (TP01-TP08) and collection of soil and potential asbestos fragment samples;
- Laboratory analysis of soil samples; and
- Data assessment and reporting.

The sampling locations from the contamination assessment are shown on Figure 2.

The field investigations identified fill on the site at depths ranging from about 0.2m in the south-western part of the site, up to about 1.6m in the north-western part of the site. The fill mound on the eastern boundary appeared to be about 2m in height and had an approximate volume of 360m^3.

Contamination, above the adopted residential soil investigation levels, was identified in the fill material in TP04 (in the form of copper and lead), and TP05 (in the form of TPH and PAH) at depths of approximately 0.5m.

Potential asbestos containing material fragments were observed across the site. Two of these fragments were analysed for asbestos. One sample (A2) showed the presence of chrysotile and amosite asbestos, whilst the other samples did not detect asbestos.

The areas of soil contamination identified during the contamination assessment are shown on Figure 3.

Due to the proposed basement car park, the most suitable remediation option identified was to remove the fill to a licensed landfill, followed by validation of the resulting excavation.

In order to provide a preliminary waste classification of the fill materials, the results of the contamination assessment were compared to the assessment criteria in the NSW DECC (2009) *Waste Classification Guidelines*. The comparison indicated that:

- The fill from around TP04 would classify as restricted solid waste;
- The fill from around TP05 would classify as hazardous waste;
- The asbestos fragments identified across the surface of the site would be pre-classified as asbestos waste; and
- The remainder of the fill materials across the site would classify as general solid waste (non-putrescible).

The spatial extents of the restricted and hazardous waste areas were not identified during the assessment.

4 REMEDIATION PROGRAMME

4.1 Remedial Goals

The broad remediation goals, with respect to contamination, are to remediate the site to a condition that is suitable for the proposed development (seniors living apartment complex).

4.2 Remediation Options

4.2.1 Remediation Hierarchy

The NEPC (1999) *National Environment Protection (Assessment of Site Contamination) Measure* provides a preferred hierarchy of options for site cleanup and/or management which is outlined as follows:

- If practicable, on-site treatment for the contamination so that it is destroyed and the concentrations are reduced to below the adopted site cleanup criteria; or
- Offsite treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level.

If the above is not practicable:

- Consolidation and isolation of the soil on site by containment within a properly designed barrier; or
- Removal of contaminated material to an approved facility followed, where necessary, by replacement with appropriate material; or
- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

4.2.2 Preferred Remedial Strategy

Based on the proposed design of the Maroba Apartments which includes a basement car park and the results of the previous contamination assessment, the preferred remedial strategy is as follows:

- Emu-picking of asbestos fragments across the surface of the site;
- Delineation of the known restricted and hazardous waste areas around TP04 and TP05;
- Once delineated, excavation and disposal of restricted and hazardous fill to appropriately licensed disposal facilities; and
- Bulk excavation of the remaining fill and disposal to landfill.

These steps are discussed in detail in Section 4.3 (below).

4.3 Proposed Remediation Plan

The remedial works will be supervised by a suitably trained Coffey Environmental Scientist, who will guide and record the remedial activities undertaken. The steps involved with the remediation of the site are presented below.

Step 1 – Emu-Picking of Asbestos Containing Materials

- This will be undertaken prior to undertaking excavation works.
- An Asbestos Removal Plan (ARP) will be prepared to guide the asbestos removal activities.
- An AS1 licensed contractor (licensed with NSW WorkCover) will undertake the emu-picking.
- Asbestos air monitoring will be undertaken during the asbestos removal activities.
- Emu-picking will involve an inspection of the current site surface and removal by hand of visible fragments of potential asbestos containing materials.
- Fragments will be disposed to a facility licensed to accept asbestos waste. Waste disposal dockets will be obtained to confirm the disposal of fragments.
- An asbestos clearance certificate will be prepared following the emu-pick.

Step 2 – Delineation of Restricted and Hazardous Waste Areas

- This will be undertaken to assess the spatial extent of the previously identified restricted waste area (around TP04) and the hazardous waste area (around TP05).
- Three test pits will be excavated around TP04. The test pits will be located approximately 5m to the north, east and south of TP04 (as TP04 is adjacent to the western site boundary, no test pits will be excavated to the west of TP04).
- Four test pits (one each to the north, south, east and west) will be excavated around TP05, spaced approximately 5m from TP05 on each side.
- The test pits will be excavated to natural soils using a mini-excavator of backhoe.
- Samples will be collected at depths of approximately 0.5m and 1m bgs.
- Samples collected from the test pits around TP04 will be analysed for heavy metals, with selected samples analysed for leachability of metals using the Toxicity Characteristic Leaching Procedure (TCLP).
- Samples collected from the test pits around TP05 will be analysed for Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons (PAH).
- In order to assess field quality control procedures, an appropriate number of quality control samples will be collected and analysed with the primary samples.

Step 3 – Bulk Excavations and Disposal of Fill

- This will be undertaken after the completion of the above two steps.
- The restricted and hazardous waste areas will be excavated and removed first. The excavated soils will be disposed to appropriately licensed landfill facilities;
- The remainder of the fill materials will then be disposed to appropriately licensed disposal facilities as general solid waste (non-putrescible).
- The fill (refer to Section 2.4 for fill types), both laterally and vertically, will be removed to the extent practical, until natural soil and weathered rock material is exposed. The resultant excavation is anticipated to extend across the entire site footprint down to approximately 1.6m bgs, though isolated deeper sections may be encountered.
- The bulk excavation works will be undertaken by a suitably licensed and experienced civil contractor.
- Bulk excavations will be undertaken using large excavators (in the order of 20-30T), loaders and other machinery as appropriate.
- The Coffey site supervisor will visually inspect the excavation works to confirm that fill materials have been removed to the extent practical, and that the base of the excavation consists of natural soils and/or weathered rock.
- Given that the surface of the natural material has been in contact with fill for a considerable time, validation samples will be collected from the base and walls of the excavation.
- Coffey will undertake a Virgin Excavated Natural Material (VENM) assessment of the exposed natural material, should excavation of natural material be required for design purposes.
- In order to track the disposal of the fill, waste disposal dockets will be obtained during the works.

A photographic record of the excavations will be maintained during the works.

5 VALIDATION OF SOILS

Validation soil sampling will be undertaken to confirm that the exposed natural soils have not been impacted by the fill. The validation sampling process is discussed in the sections below.

5.1 Soil Validation Assessment Criteria

The assessment criteria for soil validation were established based on the following references:

- NSW DEC Guidelines for the NSW Auditor Scheme (Second Edition) (DEC, 2006);
- NSW EPA, Guidelines for Assessing Service Station Sites, (NSW EPA, 1994); and
- National Environmental Protection Council (NEPC) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM) (NEPC, 1999).

The NSW DEC (2006) and NEPC (1999) present health based investigation levels for different land uses (e.g. industrial / commercial, residential, recreational etc.) as well as provisional phytotoxicity based investigation levels.

The future land use is proposed to be residential (a seniors living apartment complex). Therefore the following assessment criteria will be adopted for soil validation purposes:

- Health-based investigation levels for residential land use with accessible soils (Column 1 of Appendix II in DEC 2006); and
- Provisional phytotoxicity based investigation levels (Column 5 of Appendix II in DEC 2006).

The NSW DEC (2006) Guidelines do not provide investigation levels for volatile petroleum hydrocarbon compounds. The NSW EPA (1994) Guidelines for Assessing Service Station Sites provide an indication of acceptable threshold levels for cleanup of total petroleum hydrocarbons (TPH) compounds at service station sites to be reused for sensitive land uses. For semi-volatile petroleum hydrocarbons (C16 – C35 and >C35) investigation levels are provided in the NSW DEC (2006) guidelines, however, these are based on the NEPC 1999 health-based investigation levels, which require the laboratory analysis to unequivocally differentiate between aromatic and aliphatic compounds. Therefore, the investigation levels provided in the NSW EPA (1994) guidelines will be adopted for soil validation purposes.

The NSW DEC (2006) guidelines state that there are currently no national or NSW DEC endorsed guidelines relating to human health or environmental investigation of material containing asbestos on sites. Site Auditors must exercise their judgement when assessing if a site is suitable for a specific use in the light of evidence that asbestos may be a chemical of concern. Enhealth (2005) *Guidelines for Asbestos in the Non-Occupational Environment* provides some guidance on assessing and managing asbestos in soil although does not provide a threshold concentration or investigation level for asbestos. For this site, Coffey proposes to adopt conservative criteria for asbestos (both fibrous and cemented fragments) of ‘no detectable asbestos present in soils’.

5.2 Validation of Excavations

In order to validate the excavations, the following works will be undertaken:

- The excavations will be visually assessed to confirm that the fill has been removed to the extent practical.
- Validation Soil Samples will be taken at a ratio of:
    - Excavation Base: 1 sample per 25m^2; and
    - Excavation Walls: 1 sample per 10 lineal metres where practical. We note that the presence of weathered rock in some areas of the walls may preclude the collection of some soil samples.
- Soil samples will be taken with the aid of excavators in order to prevent the need for field staff to enter the excavation.
- Samples will be taken from the centre of the excavator bucket in order to minimise the potential for cross-contamination.
- A clean pair of disposable gloves will be worn when collecting each sample.
- Samples will be screened with a PID in order to assess the potential presence of volatile contamination.
- Samples will be kept chilled while in the field and in transit to the laboratory.

5.3 Validation Laboratory Analysis

The validation samples will be dispatched to a NATA-accredited laboratory for analysis. The samples will be analysed for the following:

- Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc);
- Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH); and
- Asbestos.

In addition, to assess field quality control procedures, the following quality control samples will be collected and analysed with the primary samples:

- Duplicate samples – 1 per 10 primary samples; and
- Triplicate samples – 1 per 20 primary samples.

5.4 Data Assessment and Reporting

The laboratory data will be reviewed by Coffey to assess data usability by applying the generally utilised data validation guidelines. Statistical interpretation of validation data may be used to assess whether the remediation goals have been met. Based on the assessment, areas that have been satisfactorily remediated will be identified and will be designated by Coffey as 'No Further Action Required.' Where visual assessments have indicated that the remediation criteria have not been met, Coffey will discuss with the Client areas requiring further remediation. Further remediation may include the excavation of additional material, sampling of excavated material and validation sampling of the excavation.

Upon completion of the remedial works, a validation report will be produced summarising the results of the remediation and final validation at the site. The report will be written to comply with industry standards and relevant guidelines and will provide a statement as to the suitability of the site for the proposed future land use.

The report will be prepared in accordance with the NSW OEH (2011) *Guidelines on Consultants Reporting on Contaminated Sites.*

6 SITE MANAGEMENT PLAN DURING REMEDIATION

The remediation works have the potential to cause environmental or human health issues during excavation and stockpiling of contaminated soils. This section of the RAP discusses measures to lower the risk of environmental harm.

The Plan will address:

- Site Access;
- Stormwater and soil management;
- Noise control;
- Dust Control and Monitoring;
- Odour control;
- Occupational health and safety;
- Other issues required to be addressed.

Each of the issues to be addressed in the site management plan is briefly discussed below.

6.1 Site Access

Adequate fences or barriers will be placed around the excavations and stockpiles to prevent access of unauthorised personnel to areas where contaminated material is exposed, and also to prevent the public from the hazards of excavations. The fencing will be lined with hessian (or similar) to prevent migration of dust from the site. Adequate warning signs will also be placed around the area.

6.2 Stormwater and Soil Management

Adequate stormwater runoff, run-on and sediment control measures will be put in place for the remedial works.

Where possible, excavated material will be immediately loaded onto trucks for offsite disposal. If temporary stockpiling of material is required, the stockpiles would need to be managed in a way to prevent harm to the environment and general public from potentially contaminated soils within the stockpiles. The following recommendations provide guidance on managing stockpiled material:

- Access to the stockpiles of potentially contaminated material should be limited by keeping stockpiles within site fences;
- Stockpiles should be placed on level ground. If this is not possible stockpiles should not be placed on slopes greater than 5°;
- Material should be placed on either an impermeable pavement such as concrete or bitumen or on strong impermeable plastic sheeting to prevent the contamination of the underlying soils. Material should not be stockpiled more than 2m high;
- Once the soils have been stockpiled, the stockpiles should be covered by weighted polythene sheets or tarpaulins to prevent erosion of stockpiled materials. Heavy objects not containing sharp edges should be placed on the sheets to prevent them from being blown by wind;

- Adequate straw bales and/or silt fences should be placed around the perimeter of the stockpile area to filter runoff from the stockpiles and prevent overland storm water flow from affecting the base of the stockpile;
- A diversion trench should be excavated, or tightly packed sand bags placed, up-gradient of the stockpile to prevent storm water running into the stockpile.

6.3 Noise

To mitigate noise impacts which may arise as a result of remedial works, the civil contractor will undertake the works in accordance with state and local noise regulations applicable to the site.

6.4 Dust Control and Monitoring

Dust control is required to prevent airborne dust being inhaled by human receptors. Airborne dust may be generated by wind action during from loose earth left on the ground. This could cause migration of contaminated dust, as well as cause a nuisance for the surrounding area and must be controlled.

Therefore, the following dust control measures are proposed:

- Dust levels will be monitored visually during site work;
- Tarpaulins will be used to line the inside of the site fence, which will assist by providing a wind break; and
- Soil will be kept adequately moist to reduce the generation of dust.

6.5 Odour

Odours may be generated during excavation of the fill material.

Coffey will monitor the air quality, using a PID and olfactory observations, in the vicinity of the excavation, within worker's breathing zones, and at the site boundary. If PID readings within the site exceed 10ppm then site personnel should wear half face respirators with organic vapour cartridges. If PID readings within the site exceed 50ppm then work should temporarily cease and workers should move upwind of the excavation until the PID readings decrease. If PID readings above 50ppm persist then odour/vapour control measures should be implemented.

If PID readings at the site boundary exceed 10ppm or significant odours are observed at the site boundary then work should cease and odour/vapour control measures should be implemented.

Odour control measures could include spraying of a surfactant such as Biosolve or covering of the excavation or contaminated material.

The Contractors will properly maintain machinery to reduce engine emissions and exhaust.

6.6 Occupational Health and Safety

A Health, Safety, Security and Environmental (HSSE) Plan will be prepared by a suitably qualified and experienced environmental consultant prior to commencement of work, in accordance with relevant NSW legislation.

The HSSE Plan should include, but not be limited to, the following.

- Hazard Identification and Control;
- Dust and odour monitoring during excavation and stockpiling works;
- Chemical Hazard Control;
- Handling Procedures;
- Personal Protective Equipment;
- Work Zones;
- Decontamination procedures;
- Contingency Plans; and
- Incident Reporting.

The HSSE Plan should be periodically reviewed and updated prior to various project tasks being conducted.

The contractor, supporting sub-contractors and third party observers to the site will be required to work strictly to this plan. During site activities, only approved personnel should be allowed access to the remediation work area.

The HSSE Plan will identify hazards, assess the risks posed by the hazards and recommend measures to control the hazards.

6.6.1 Summary of Contamination and Exposure Pathways

Exposure of site users to contaminants could occur through:

- Dermal contact with contaminated soil;
- Ingestion of contaminated soil;
- Inhalation of hydrocarbon vapours;
- Inhalation of contaminated dust; and
- Inhalation of asbestos fibres.

6.6.2 Health and Safety Control Measures for Contamination Hazards

The following section presents some control measures that should be adopted to manage health and safety hazards posed by contamination during the remediation. These control measures include:

- Site Access;
- Personal Protective Equipment;
- Safe Work Practices.

It is important to note that this section only covers contamination issues associated with contaminated soil. It is also important to note that these procedures will need to be evaluated for effectiveness and where necessary revised and/or improved during site work.

Site Access

The area will be barricaded and only authorized personnel will be allowed entry to the excavation areas.

Personal Protective Equipment (PPE)

To minimise short and long term health risks associated with the potential exposure to contaminants, the minimum level of PPE required for persons undertaking the excavations include:

- Hard hats;
- High visibility clothing;
- Long sleeve shirts and trousers;
- Steel capped workers boots;
- Safety glasses;
- Chemical resistant rubber gloves for persons coming in contact with the soil; and
- Tyvek suits and face masks (when excavation and disposal of asbestos materials is being undertaken.

Safe Working Practices

Chemical resistant gloves should be changed daily, and disposed appropriately.

The contractor should ensure that adequate signage is present across the remediation area to warn unauthorised persons from entering the area.

Eating, drinking, chewing gum or tobacco, smoking or any practice that involves hand to mouth transfer increases the probability of ingestion of contaminated soil or dust into the body. With respect to remediation activities, hands must be thoroughly washed after coming into contact with soil or groundwater on the site before eating, drinking or smoking.

Smoking will be prohibited in the remediation areas.

7 CONTINGENCY PLAN

A contingency plan is outlined in Table 3, listing potential events that may arise during the field work and actions that will be undertaken if unexpected conditions occur.

TABLE 3 - CONTINGENCY PLAN

UNEXPECTED CONDITION	ACTION
Contaminated soil or fill extends further than expected.	The client would be called to discuss options. Options could include excavating soils further, or potentially capping soils if found below design levels.
Rainwater fills the excavation pits and visual and olfactory observations suggest that contamination could be present.	Sample water and assess options for disposal. Options could include disposal to sewer or removal by a licensed liquid contractor following sampling and analysis.
Identification of unexpected contaminated materials during excavations.	Stop work in that area. Additional validation samples and analytes may be required to be collected and analysed for (depending on the nature of the material).
Identification of asbestos fragments in excavated soil during excavation works	Immediately stop works and inform the Project Manager. The excavated soil will class as Asbestos Waste and will need to be disposed to a licensed disposal facility. The ARP will be updated and asbestos air monitoring will be undertaken during excavation works. A clearance certificate will be prepared following excavation works.
Other	Other unexpected events which may affect the outcome of the investigation would be notified to the Project Manager. At that time potential actions to address the unexpected event will be assessed and presented.

8 LICENCES AND APPROVALS

The remediation is classed as Category 2 remediation under SEPP 55. This category does not require development consent. Thirty days notice must be given to the local Council (Newcastle City Council).

The notice must:

- Be in writing;
- Provide the name, address and telephone number of the person who has the duty of ensuring that the notice is given;
- Briefly describe the remediation work;
- Show why the person considers that the work is Category 2 remediation work by reference to Clauses 9, 14 and (if it applies) 15 (1);
- Specify, by reference to its property description and street address (if any), the land on which the work is to be carried out;
- Provide a map of the location of the land;
- Provide estimates of the dates for the commencement and completion of the work.

Impacted soil requiring off-site disposal will be transported and disposed to licensed waste facility. Material leaving the site will be tracked and documented. Waste disposal dockets will be obtained and included in the validation report.

9 CONTACTS

The following contact numbers for project personnel are given for the duration of the project. In the event that project personnel change, the relevant parties will be notified.

TABLE 4 - PROJECT PERSONNEL CONTACT NUMBERS

PERSONNEL	CONTACT NUMBER
Client Project Manager TBA	Phone: TBA Mobile: TBA
Environmental Consultant, Project Manager Emma Coleman, Coffey Environments Australia Pty Ltd	Phone: (02) 4016 2300 Mobile: 0428 104 881
Civil Contractor TBA	Phone: TBA Mobile: TBA
Newcastle City Council	Phone: 02 4974 2000

10 COMMUNITY RELATIONS

Adjoining residents should be advised of the proposed works and contractor and Coffey contact details should be made available to them. It is recommended that truck routes for movement of contaminated soil be considered when assessing the impacts of remediation works on nearby residents.

Every effort should be made to ensure that the community is appropriately informed. Enquiries regarding environmental and contamination issues from members of the local community and neighbouring properties should be documented and referred to Client and Contractors.

11 LIMITATIONS

It is the nature of contaminated site investigations that the degree of variability in site conditions cannot be known completely and no sampling and analysis program can eliminate all uncertainty concerning the condition of the site. Professional judgement must be exercised in the collection and interpretation of the data.

In preparing the RAP, current guidelines for assessment and management of contaminated land were followed. This work has been conducted in good faith in accordance with Coffey's understanding of the client's brief and general accepted practice for environmental consulting.

This RAP was prepared for EJE Architecture Pty Ltd with the objective of providing guidance on the remediation and validation activities to be undertaken in order to render the site suitable for the proposed development. No warranty, expressed or implied, is made as to the information and professional advice included in this report. The report is not intended for other parties or other uses. Anyone using this document does so at their own risk and should satisfy themselves concerning the applicability of its application and where necessary should seek expert advice in relation to the particular situation.

12 REFERENCES

Central Mapping Authority (1986) 1:25,000 Wallsend Topographic Map 9130-3-N. Second Edition.

Coffey Environments Australia Pty Ltd (2011) Contamination Assessment, Maroba Apartments, Cnr Edith and High Streets, Waratah NSW, Reference ENAUWARA04216AA-R01 dated 11 November 2011.

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SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

Important information about Coffey Environmental Report

Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of the land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report has been written for a specific purpose

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an on-going operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

Scope of Investigations

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within practical time and budgetary constraints, and in reliance on certain data and information made available to Coffey. The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

Subsurface conditions can change Interpretation of factual data

Subsurface conditions are created by natural processes and the activity of man and may change with time. For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project and/or on the property.

Interpretation of factual data

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.

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Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment or on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

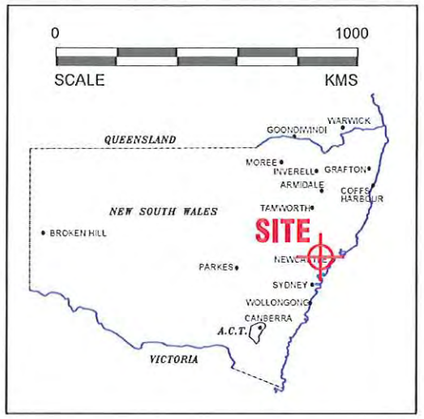
Contact Coffey for additional assistance

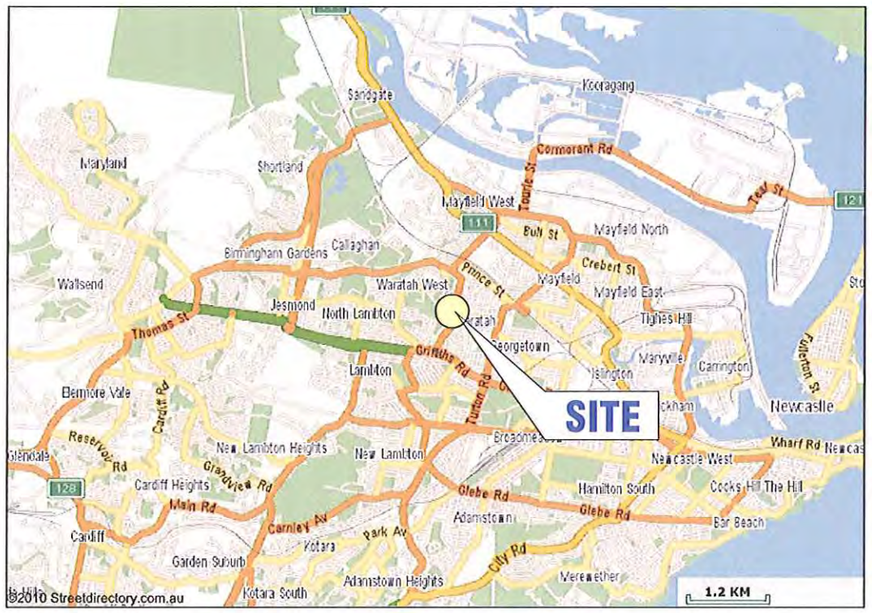
Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

Figures





Aerial image source: Google Earth Pro 2011
Aerial image ©: Sinclair Knight Merz 2011

0 25 50 75 100 125
SCALE 1:2500 (A3) METRES

revision	description	drawn	approved	date

drawn	CGT
approved	EMC
date	25/10/2011
scale	AS SHOWN
original size	A3

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client: EJE ARCHITECTURE PTY LTD

project: MAROBA APARTMENTS - CONTAMINATION ASSESSMENT
CORNER EDITH AND HIGH STREETS
WARATAH, NSW

title: SITE LOCALITY PLAN

project no: ENAUWARA04216AA

figure no: FIGURE 1

IMAGE SOURCE: Nearmap.com, Hypertiles, 17/09/2011

N

LEGEND

TP02 TEST PIT SAMPLING LOCATIONS (Coffey, October 2011)

BH8 GEOTECHNICAL BOREHOLE LOCATIONS (2007) BORE LOCATIONS

A2 POTENTIAL ASBESTOS CONTAINING MATERIAL SAMPLE

revision	description	drawn	approved	date

0 5 10 15 20 25
SCALE 1:500 (A3) METRES

drawn	CGT
approved	EMC
date	25/10/2011
scale	AS SHOWN
original size	A3

coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

client: EJE ARCHITECTURE PTY LTD

project: MAROBA APARTMENTS - CONTAMINATION ASSESSMENT
CORNER EDITH AND HIGH STREETS
WARATAH, NSW

title: SAMPLING LOCATION PLAN

project no: ENAUWARA04216AA

figure no: FIGURE 2

IMAGE SOURCE: Nearmap.com, Hypertiles, 17/09/2011

N

LEGEND

TP02 TEST PIT SAMPLING LOCATIONS (Coffey, October 2011)

BH8 GEOTECHNICAL BOREHOLE LOCATIONS (2007) BORE LOCATIONS

A2 POTENTIAL ASBESTOS CONTAINING MATERIAL SAMPLE

APPROXIMATE FORMER BUILDING FOOTPRINT

Sample	Sample Depth (mBGS)
Analyte	mg/kg

SHADED VALUES INDICATE CONCENTRATION EXCEEDS RESIDENTIAL LAND USE CRITERIA

SHADED VALUES INDICATE CONCENTRATION EXCEEDS PROVISIONAL PHYTOTOXICITY CRITERIA

revision	description	drawn	approved	date

SCALE 0 5 10 15 20 25 METRES
1:500 (A3)

drawn	CGT
approved	EMC
date	25/10/2011
scale	AS SHOWN
original size	A3

coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

client: EJE ARCHITECTURE PTY LTD

project: MAROBA APARTMENTS - CONTAMINATION ASSESSMENT
CORNER EDITH AND HIGH STREETS
WARATAH, NSW

title: SOIL CONTAMINATION

project no: ENAUWARA04216AA

figure no: FIGURE 3

Our ref: 7480-ltr-015-NCC
Date: Tuesday, 22 November, 2011

General Manager
Newcastle City Council
282 King Street
NEWCASTLE NSW 2300

ATTENTION: Mr Peter Chrystal

Dear Sir,

RE: DA 11/0527
MAROBA SELF CARE APARTMENTS, 58 EDITH STREET, WARATAH

Please find attached revised documentation for the Maroba Apartments which incorporate minor changes as requested by Council and the Urban Design Consultative Group noted in Council's letter dated 20th July, 2011. Documentation includes:

- Revised plans, elevations and sections.
- Coloured elevations and updated photo montages.
- Revised shadow diagrams
- Updated Basix Certificates
- Phase Two Contamination Assessment by Coffey Environments
- Remedial Action Plan by Coffey Environments

The revisions include the following:

Council Concerns

1. Open Space
The Level 1 layout has been amended to increase the size of the Community Room, which has reduced the number of units on this level by 1. Unit 1.10, previously listed as Unit 1.11, now has 18m2 of private open space, above the required minimum 15m2 of private open space.

2. Car parking
The plans now indicate a figure of 91 bedrooms and car spaces totalling 47. This overcomes the previously stated 1 car space deficiency. Council expressed concern that the studies could be used as bedrooms which would then require additional car spaces. Maroba has a policy that would not allow families to purchase and occupy any of the apartments. As an 'over 55' development the units are only able to be occupied by individuals or couples, therefore the study will only ever be a study. Some of the studies have been amended in layout and are now more open to the living areas so that they cannot be a closed off room.

3. Social Planning Comments
The pedestrian bridge across to the adjoining Maroba Nursing Home is 1500 wide, enough for a wheelchair and a pedestrian to pass. An 1800 mm wide area exists at the end of the bridge to allow for two wheelchairs to pass.
Via the bridge residents have safe access to parking areas where the Maroba bus can pick residents up and drop them off.

4. Environmental Services
Maroba has carried out further Phase 2 site investigation into the potential contamination on the site since the demolition of the previous building. Coffey Environments have carried out a Contamination Assessment of the site and found some heavy metals contamination in one part of the site and potential asbestos fragments over the site from demolition. This was followed this up with a Remedial Action Plan for the site outlining how this can be addressed to ensure the site is suitable for the proposed seniors living apartments,
(see attached reports).

EJE architecture
412 King Street
Newcastle NSW 2300
ph: 02 4929 2353
fx: 02 4926 3069
mail@eje.com.au
ACN 002 812 843
ABN 82 644 648 849

Concerns from Objector

Maroba is willing to discuss these issues with the objector to assist in reducing their concerns. Edith Street is already a busy road and the road is higher than the houses to the east. Maroba is willing to look at increasing fence heights or improving the acoustic performance of fences along Edith Street if this can help reduce the objectors concerns with privacy and construction noise impacting their quality of life. Braye Park already overshadowed the dwellings along Edith Street in the late afternoon and with Maroba apartments sitting lower than the Braye Park hill and slightly less in height than the Mater Hospital further along Edith Street, the increase to overshadowing by the proposed building is minimal. Shadow diagrams showing the impact of the development have been included.

Urban Design Consultative Group Comments

The Group were supportive of the proposed building saying that:

- *'Given the extent of the large scale development that has already occurred along the West side of Edith Street, the development of the subject site with a building of the scale proposed, is considered acceptable in the context of the existing development.'*
- *'This apartment building and the Mater Hospital will form the two termination points between which lower scale development runs almost continuously between those two "bookends".'*
- *'These non-compliances with the numerical controls need to be considered in relation to the context and particularly the existing development, not only on this site but also that of the Mater Hospital'*
- *'The density of this development is not considered out of context'*
- *'The height of the proposal has been set with regard to a compatible relationship with the ridgeline of Braye Park, it is therefore considered generally acceptable.'*
- *'The Group believes that the proposed development is acceptable, in terms of location, height, scale and density.'*

They did have several constructive suggestions as to the aesthetics of the building.
The Upper levels of the building have been refined slightly as suggested by the UDC Group. The units previously located in the north-western projection of the plan have been relocated to the south where the building previously stepped in. This opens up the west-facing units to more winter sun. The pitched roofs have been replaced by a flat skillion roof which is more in keeping with the Mater Hospital. The lower stories of the building have also been modified slightly to create a better relationship with the adjacent Maroba Manor.

The upper level balustrades relating to the bedrooms have been changed from glass to solid to provide more privacy for the bedroom areas and to allow suitable screening of potential air conditioning condenser units and for outdoor drying of clothes.

The semi-basement car park has been provided with larger openings improving the amount of natural light and ventilation making it more attractive and reducing the need for mechanical ventilation.

The fence previously shown on the landscape plan on the western boundary has been removed as it was intended to provide a pleasant landscape connection to the other areas of the Maroba complex.

The general amenity of the building has been improved by the relocating of the units on the North West corner of the building to the south side reducing the overshadowing on a number of western facing units and on the outdoor area of the Community Room. The Community Room has been retaining in the Level 1 location, although doubled in size, to provide an easily accessible communal space for all residents. High solid screen walls on either side of the outdoor terrace of Community Room provide acoustic separation for the two units either side of the common space.

The lifts have been adjusted slightly to open up into the larger spaces adjacent to them rather than into the corridor providing a more pleasant space to wait and for people to

circulate. Also to improve access to the building a link between the two buildings has been created on Level 5, so that in periods of maintenance or emergency breakdown, access to the apartments can be provided with less reliance on walking up stairs.

For safety reasons the deep recesses previously proposed to the doors to Edith Street have been reduced to approximately 2 metres. Also, access is no longer possible to the private balconies to the units either side of the street entrances.

We appreciate the input from the Urban Design Consultative Group and believe that the incorporation of their suggestions has improved the development.

We now believe we have carried out the appropriate additional site investigation and have amended the drawings slightly to incorporate the input from Council and the Urban Design Consultative Group. The building is substantially the same as it was in bulk and scale, height and FSR. Given the overwhelming public support for the Development Application we do not believe that this warrants the need for public notification again. Should you have any further questions please do not hesitate to contact the undersigned.

Yours faithfully
EJE ARCHITECTURE

Glen Spicer
DIRECTOR
Architect

adw johnson

Ref: 238275: CR:CM

12th December, 2011

The General Manager
Newcastle City Council
PO Box 489
NEWCASTLE NSW 2300

Attention: Peter Chrystal

Dear Sir,

DEVELOPMENT APPLICATION 11/0527
MAROBA SELF CARE HOUSING 58 EDITH STREET WARATAH

I refer to the proposed self care housing units proposed by Maroba at the subject property. We are aware that Council has raised concern with the fact that the proposed development does not conform to the relevant planning controls concerning height and FSR and that approval of the application would set a precedent.
Further to the recent additional information we now also provide an opinion from Sparke Helmore Solicitors as to the concept of precedent and also in relation to departures from the DCP. It is our view that consideration of this additional information will allow Council to support the proposed development.

As part of Council's report to the JRPP it would be appreciated if a copy of this letter and the attached advice from Sparke Helmore Solicitors is provided directly to the panel.

In reference to the additional information and in consideration of information that has already been provided we make the following comments:

- It is our view that there is a clear and overwhelming social need and benefit provided by Maroba, a not for profit service provider. This is justified in the provided social report that clearly identifies an undersupply of accommodation for seniors in the Newcastle LGA. Council's own policies on the issue identify a need to encourage accommodation for seniors. It is our view in this instance that any potential for negative impacts by non compliance with the standards within council's DCP is overwhelmed by the benefit provided and justifies the departure.

- We are of the view that concerns about the project setting an unwanted precedent are overcome by the unique circumstances of this case. It is entirely appropriate to consider the merits of this case and depart from the height and FSR control noting the social benefit, noting the fact that the site's location and position within the context of the locality enables additional height and scale to be accepted.

ADW JOHNSON PTY LIMITED
ABN 62 129 445 398

central coast
2 bounty close, tuggerah nsw 2259
po box 3717, tuggerah nsw 2259
phone. 02 4305 4300
fax. 02 4305 4399
video conf. 02 4305 4374
email. coast@adwjohnson.com.au

www.adwjohnson.com.au

hunter region
7/335 hillsborough road, warners bay nsw 2282
phone. 02 4978 5100
fax. 02 4978 5199
video conf. 02 4954 3948
email. hunter@adwjohnson.com.au

The fact that there are no immediate neighbours that would be overshadowed or otherwise adversely impacted by the proposed development.

Also the site does not rely on distance to a commercial centre to cater for its residents, this is a development with a target market that is well catered for by the existing services offered on site by Maroba. Of course good public transport is also available to existing centres from the site. It is to be expected that Council's strategic planning for the locality could not have anticipated the specific development by Maroba , it is important that assessment of good development can occur on merits nonetheless.

- Council's Urban Design Consultative Group, an independent expert design panel, a panel for the purpose of assessing the proposal under SEPP 65 has considered the proposed development and concluded that it is appropriate within its setting.

- We note, from the attached advice from Sparke Helmore, that departure from Councils DCP is possible and that departure from it should not automatically result in refusal. In addition the attached opinion from Sparke Helmore confirms that precedent should not serve as a reason to refuse the proposed development.

- The public exhibition that Council has undertaken as part of the assessment process resulted in some 70 letters of support and 1 letter of objection. It is apparent that public opinion is in support of the development. The lack of objection in relation to the proposed development is not surprising when considering that the site is sufficiently separated from neighbours so as not to result in significant adverse impacts.

It is considered that the proposed development on its merits warrants approval and that any concern of a precedent is not a relevant consideration in this instance. Stepping outside of Council's DCP is entirely appropriate noting the lack of impacts in doing so and noting the public benefit generated by a not for profit organisation in pursuit of Council's broader social goals, evidenced in its general policy. We urge Council's assessment team to reconsider its position and to recommend approval of the application.

Should you have any question in relation to the proposed development please do not hesitate to contact the undersigned.

Yours faithfully,

Craig Marler
Senior Planner
ADW JOHNSON PTY LTD
HUNTER
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SPARKE HELMORE
LAWYERS

Newcastle

Level 7
Sparke Helmore Building
28 Honeysuckle Drive
Newcastle NSW 2300

PO Box 812
Newcastle NSW 2300

p » +61 2 4924 7200
f » +61 2 4924 7299
DX 7829 Newcastle

www.sparke.com.au

Our ref:NLS: MAR064-1

9 December 2011

Maroba Nursing Home
c/- ADW Johnson
7/335 Hillsborough Road
WARNERS BAY NSW 2282

Attn: Craig Marler

Also by Email

Dear Craig

Advice about the consideration of 'precedent effect' for the proposed extension to the Maroba Nursing Home

Thank you for your instructions.

1 Advice sought

1.1 Maroba requires advice about whether it is relevant for the Joint Regional Planning Panel to consider whether the proposed extension of the Maroba Nursing Home in Waratah will create a 'precedent' in terms of its height, bulk and scale.

1.2 We are also instructed to advise about whether the proposal is required to strictly comply with the controls in the DCP.

2 Background

2.1 In order to establish a context, we think it is necessary to provide a brief outline of our understanding of the matters relevant to this advice, based on the information provided by you. If this information is in any way inaccurate, please let us know as it may impact on our advice.

2.2 These matters are as follows:

(a) The proposed extension of the Maroba Nursing Home in Waratah will result in a seven storey building with a floor space ratio that is higher than the control in the relevant Development Control Plan (DCP).

(b) We are instructed that given the topography of the land and the nearby Mater Hospital buildings, ADW Johnson does not consider the proposal will be out of character or result in significant amenity impacts in terms of its bulk and scale.

(c) We are instructed that an issue has been raised with ADW Johnson about the proposed development setting a 'precedent' for other larger developments in the area. Maroba now seeks advice about whether it is relevant for the consent authority to consider that issue in its decision on the merits of the proposal.

3 Advice

The 'precedent effect'

3.1 The leading case on the issue of taking the 'precedent effect' of a proposed development into account is *Goldin v Minister for Transport Administering the Ports Corporatisation and Waterways Management Act 1995* (2002) 121 LGERA 101. In that case, Justice Lloyd considered numerous previous cases on the issue and concluded:

> ... if the Court is entertained with an application for a proposed development which is both *objectionable in itself* and where there is a sufficient probability that there will be further applications of a like kind, then the fact that a consent would operate as a precedent may be taken into consideration.

3.2 The decision in *Goldin* relied on the following statement of Sugerman J in *Emmot v Ku-ring-gai Municipal Council* (1954) 3 LGRA 177:

> Applications must be considered on their own merits and it would appear unduly onerous to refuse an application, unobjectionable on its individual merits, on the mere chance of probability that may be later applications sufficient, if approved, to produce in their totality some undesirable condition. In such a case as the present, if what originally appeared to be a mere possibility or chance turned out later to become a distinct possibility, there would be no reason why the council should not at that stage call a halt, if it should then appear proper to do so. Justice is not offended in those circumstances by the refusal of further applications calculated to lead to objectionable conditions after the granting of one or more earlier applications unobjectionable in themselves.

3.3 On the basis of *Goldin* and *Emmot*, it is necessary for the consent authority to first consider the application for the proposed development on its own merits. It would not be open to the consent authority to take into account the potential precedent effect of the extension of the Maroba Nursing Home unless:

(a) The development was 'objectionable in itself'; and

(b) There was sufficient evidence before the consent authority (such as development applications or proposals) to establish a probability that there will be further applications of a similar kind.

3.4 If the above circumstances do not exist, then it is not appropriate for the consent authority to refuse the application on the basis that it might set an undesirable precedent. This is because, the consent authority can consider the impacts of any future proposals, and if those would lead to objectionable conditions, then the consent authority may have reason to refuse those applications.

Non-compliance with DCP controls

3.5 As we understand it, the Council has expressed some concern about the departure from the DCP controls creating a precedent, in light of the decision in *Stockland Development Pty Ltd v Manly Council* 2004 NSWLEC 472.

3.6 In *Stockland v Manly*, the Court considered the weight to be given to DCP controls (and other planning policies implemented by consent authorities). In this case, the Court confirmed the following principles for applying development control plans:

- A DCP is a detailed planning document which reflects a council's expectation for parts of its area. A DCP must be consistent with the relevant LEP, but may operate to confine the intensity of development otherwise permitted.
- A DCP adopted after consultation with interested persons, including the affected community, will be given significantly more weight than one adopted with little or no community consultation.
- A DCP which has been consistently applied by a council will be given significantly more weight than one which has only been selectively applied.
- A DCP which can be demonstrated, either inherently or perhaps by the passing of time, to bring about an inappropriate planning solution, especially an outcome which conflicts with other policy outcomes adopted at a State, regional or local level, will be given less weight than a DCP which provides a sensible planning outcome consistent with other policies.
- DCPs aid in consistency of decision-making. If decisions are consistent with a DCP, developers or persons affected by nearby development have an opportunity to make decisions in relation to their own property which is informed by an appreciation of the likely future development of nearby property.

3.7 In *Stockland v Manly*, the Court, in fact considered the weight to be given to a planning policy prepared by the Council. On the facts in that case, McLellan J considered that the proposed development would have significantly greater impacts than one that did not exceed the relevant controls. His Honour stated:

> Unless cogent reasons suggest otherwise, a council is also entitled to expect the Court to require development to conform to the adopted parameters.

3.8 Accordingly, the application for the proposed development will need to provide cogent reasons for the departure from the controls, particularly by reference to acceptability of impacts. In *Stockland v Manly*, the Court found that the impacts resulting from exceedences of floor space ratio controls and height controls were unacceptable. McLellan J found that the excessive height of the development lead to overlooking and an overbearing building of entirely inappropriate scale. In addition, His Honour determined that the proposed multi-level carpark was inconsistent with the residential use and character of the

area. The above unacceptable impacts, combined with the non-compliances with development controls, resulted in the Court refusing to grant consent to the proposed development.

3.9 Maroba's development will need to justify a departure from the DCP based on the individual merits of the proposed development, particularly in terms of bulk and scale and compatibility with the streetscape. As an example, in *Nanevski Developments v Rockdale City Council* [2010] NSWLEC 1369, the Court considered the effect of a proposed aged care facility which exceeded floor space ratio requirements. Commissioner Murrell stated:

> I have concluded that the building while it will read as an aged care facility it will not be incompatible in the streetscape that is undergoing change from the original single storey dwellings by more recent redevelopment of dual occupancies ... I am also still satisfied that the proposed development is not out of character with the area as seen today. When I refer to "character", one must have regard to the fact that this is a development application for an aged care facility and by its very nature, I accept the submission of the applicant that with a floor space ratio of 1:1, the proposal will be different in its appearance, it cannot be expected to mimic the residential development in the area which has an FSR for the zone of 0.5:1 ... The proposed development will present as a different form and use as that of an institution, but it is not of such a bulk that it is incompatible and will harmoniously coexist with the existing and future residential area in my assessment.

3.10 We are instructed by Maroba's project team that the following justifies the height, bulk and scale of the proposed development:

(a) Taking into account the topography of the locality and nearby buildings, the bulk and scale of the proposed development will be acceptable in its context.

(b) The proposed height and bulk of the proposed development does not impact on the amenity of the locality, given the separation of the site from other residential neighbours.

(c) The FSR determined by the DCP for the site is based on distance to a centre. This factor should not be considered for the proposed development as many services will be offered on site and the site is located with good access to public transport.

(d) The social benefits of the proposed development for the provision of seniors housing are consistent with Council's policies and would and justify departure from the DCP, particularly where there is no impact on amenity of neighbours.

(e) The Council's Urban Design Consultative Group has supported the proposed development.

3.11 The above matters, particularly the minimal or negligible impact on neighbouring properties, are capable of being 'cogent reasons' for the departure from the controls. If so, the present circumstances can therefore be

distinguished from those in *Stockland v Manly*, where the proposed development would have produced unacceptable impacts.

3.12 It is open to the consent authority to form the view that departure from the DCP controls for this particular development is justified because of the unique set of circumstances applying in this case. Those circumstances will not necessarily apply to other development, and granting consent to this development will not therefore result in the DCP controls being undermined in the future.

4 Summary of advice

4.1 If:

(a) the proposal is unobjectionable in itself; or

(b) there is no evidence of the likelihood of similar applications being made;

it will not be open to the consent authority to take into account the potential precedent effect of the proposed extensions to the Maroba Nursing Home.

4.2 The present circumstances, particularly the minimal or negligible impact on neighbouring properties, are capable of being 'cogent reasons' for the departure from the controls and distinguished from those in *Stockland v Manly*.

4.3 It is open to the consent authority to form the view that departure from the DCP controls for this particular development is justified because of the unique set of circumstances applying in this case. Those circumstances will not necessarily apply to other development, and granting consent to this development will not therefore result in the DCP controls being undermined in the future.

4.4 This summary should be read together with the detailed reasoning and analysis provided in the above sections.

If you have any questions about this advice, please contact us.

Yours faithfully

Alan McKelvey
Special Counsel
Accredited Specialist
Local Government Law

Contact: Naomi Simmons
Senior Associate
+61 2 4924 7325
naomi.simmons@sparke.com.au