



BUILDING STANDARDS WORKSHOP No. 3





outline

- Building Standards Overview
- CMS/Building Standards
- Building Approval Pathway
- Using the NEV Rating Tool (Scoresheet)
- Submitting a Design for Approval
- Construction
- Worked example
- Practice session
- Feedback & Review



NEV Bldg Stds Overview

Interim Bldg Stds - CMS

CATEGORY	SUB-CATEGORY	GOAL	MEASUREMENT CRITERIA	INITIAL VILLAGE MINIMUM*
Water	Potable Water Usage	Conserve drinking water from NEV dam	Water efficient devices; Water effective landscaping & gardens; Use of recycled water in house; Strategies for high water demand features e.g. irrigation	70% reduction
	Stormwater Greywater & Black-Water Management	Conserve drinking water; reduce stormwater, greywater, black water; consume recyclable surplus	Water Sensitive Urban Design (WSUD); how stormwater is harvested; ponds; rain gardens; infiltration systems; buffers incl. water tanks; swales; waterless toilets; where recycled water is utilised	70% reduction
Energy	Thermal Performance	Decrease Energy usage	Passive solar house design considering orientation, windows, insulation, thermal mass, shading and ventilation	7 stars minimum ^{NSR}
Energy	Other Energy Usage	Decrease Other Energy usage	Building Management System (BMS); Heating & cooling methods; Hot water units; Appliances; Lighting (type, flexibility & optimizing); Standby power usage; Clothes drying	70% reduction
	Renewable Energy	To at least meet annual demand	Photovoltaic panels	At least meet annual demand
	Peak Power Demand	Reduce summer and winter peak loading	Standby switches/ power boards; Energy monitoring system; Basic control system e.g. timer; Remote control system (app?); Separate circuits for non-essential appliances; load shifting by Electricity Provider; have PV plus battery system; western facing panels; panel pitch to suit winter sun angle; surplus renewable energy above that required to meet the energy demand over the year	(Points are awarded for these items)
Materials	Materials	Lower the health & environmental impact of materials for sourcing, production and disposal	Having a minimum amount of materials; being durable; designing for ease of deconstruction at end of building life; low embodied energy; high recycled content; natural and renewable resource materials; low human health impact materials; locally sourced materials	(Points are awarded for these items)
Waste	Waste	Domestic and construction	Recycle waste streams; reuse and recycling of construction wastes; design to minimise off-cuts & waste with prefabrication, using standard sizes etc	(Points are awarded for these items)
Indoor	Indoor Environmental Quality (IEQ)	Optimum ventilation & acoustics; low pollutant level	Sealing of house; day lighting; type of walling, flooring and design for the acoustic consideration of neighbours; low emission materials, control of mould and condensation	(Points are awarded for these items)
BONUS Only counted by Building Review Panel if just failing 70/100 points				
Innovation	Innovation	Foster new ideas	Owners to demonstrate how elements exceed Category minimums NB: Any innovative proposals need preliminary assessment from the BRP at the early design stage.	(Points are awarded if other Categories are exceeded)
Other	Other	Adaptability; Resilience; Noise; Liveability	The ease of adapting house for future uses; ability to withstand severe external forces including fires; noise control measures e.g. pump locations (including heat pumps); Ability to improve access for occupants over time	Meet bushfire requirements; design for low noise



Is NEV Bldg Std Sustainable?

- Fit for purpose
- Low total **cost** of ownership
 - Optimum star rating, bldg materials, PV
- Resource Efficiency
 - Energy, peak power, water
 - Durability of materials
- Low pollution
 - Zero total carbon
 - Zero waste
- **Liveability**
 - Adaptability
(inside flexibility)
- Resilience



Bldg Stds Sustainable and Resilient House Criteria

Scoresheet Category		Durability	Resource Efficiency	Adaptability (inside flexibility)	Low total cost of ownership	Liveability	Fit for purpose	Zero total carbon	Resilience
		Long-lasting with long warranties	Low impact, or few or efficient devices	Rooms can change easily, zoning easy	Initial plus on-going costs	Child, aged, less abled access	Residential, suitable for occupants	Zero embodied and operational carbon	Can withstand shocks eg. storms, earthquake, bushfire
WATER	Reduce drinking water use	Contingency,	YES				Yes	Lower usage reduces I/F	Water tanks & compost toilets
ENERGY	Energy efficient devices ? Renewable Energy, Peak Power Demand		YES	Yes	Yes (grid, micro-grid & shared peaks)	Modern cons	Yes	If offset, or more PV than needed	Grid, Micro-grid, batteries
MATERIALS	Lower the impact of materials on non-renewable resources, the natural environment and on human health	YES	Small houses	Easy upgrade		Yes	Yes	Low embod. carbon	Renewable materials
WASTE	Domestic & Construction resource recovery	YES	YES	Recycle storages	Yes			YES	
INDOOR	Indoor air quality; Acoustic comfort; Shadow diagram; Light pollution		Yes	Yes	Yes	Yes	Yes		
OTHER	Liveability Resilient design	Yes				YES			YES
BONUS/ INNOVATION POINTS	Innovative materials, design Food Composting toilet. Rain water tanks	Yes	Yes		Yes		Yes	Yes	Yes



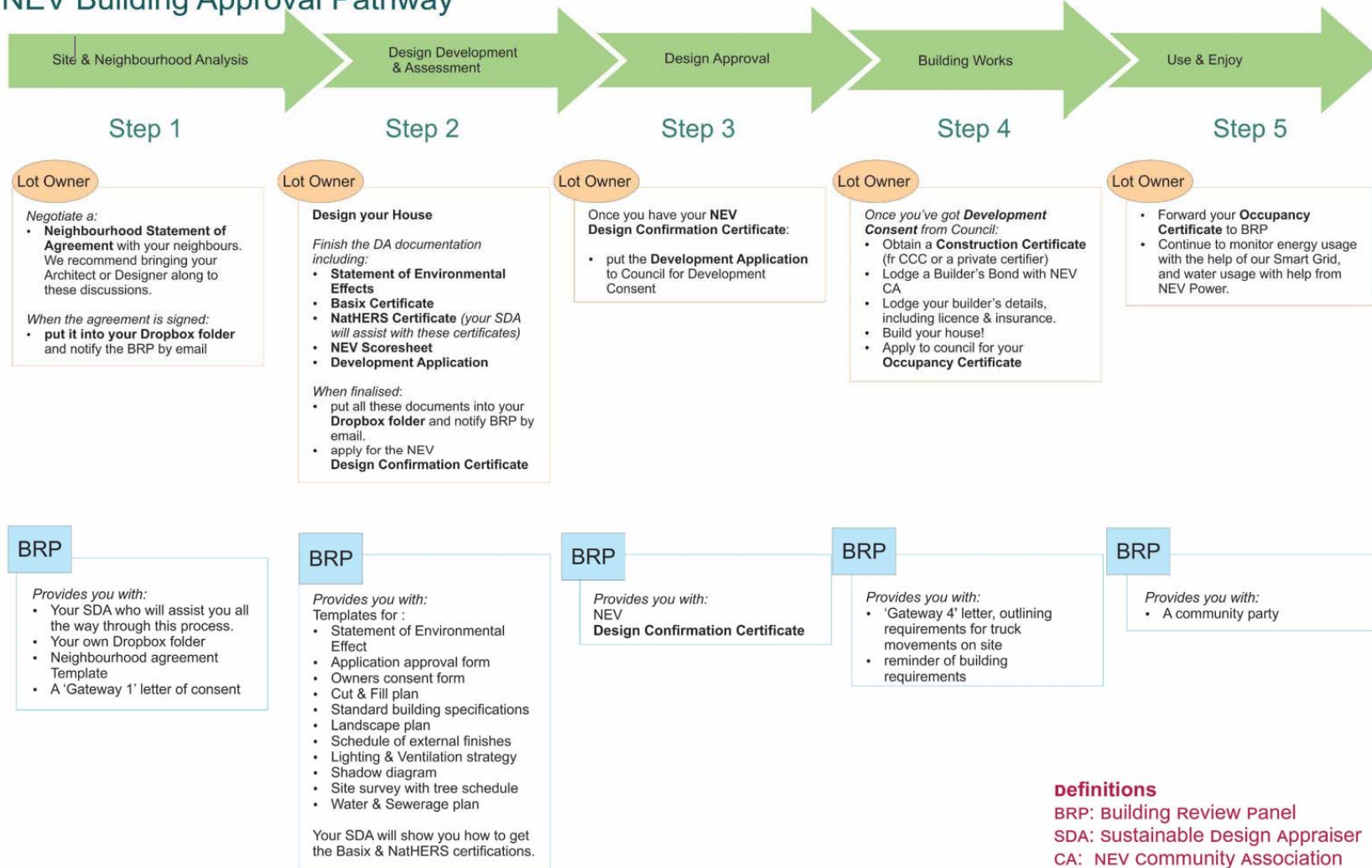
CMS/Building Standards

- Community Management Statement
- Clauses 42, 43 & 44 of CMS
- Annexure 3 Building Standards
- Building Review Panel
- NEV Sustainable Design Appraisers
- Appeals Process
- Stage 1 & timeframe



Approval Process

NEV Building Approval Pathway



definitions

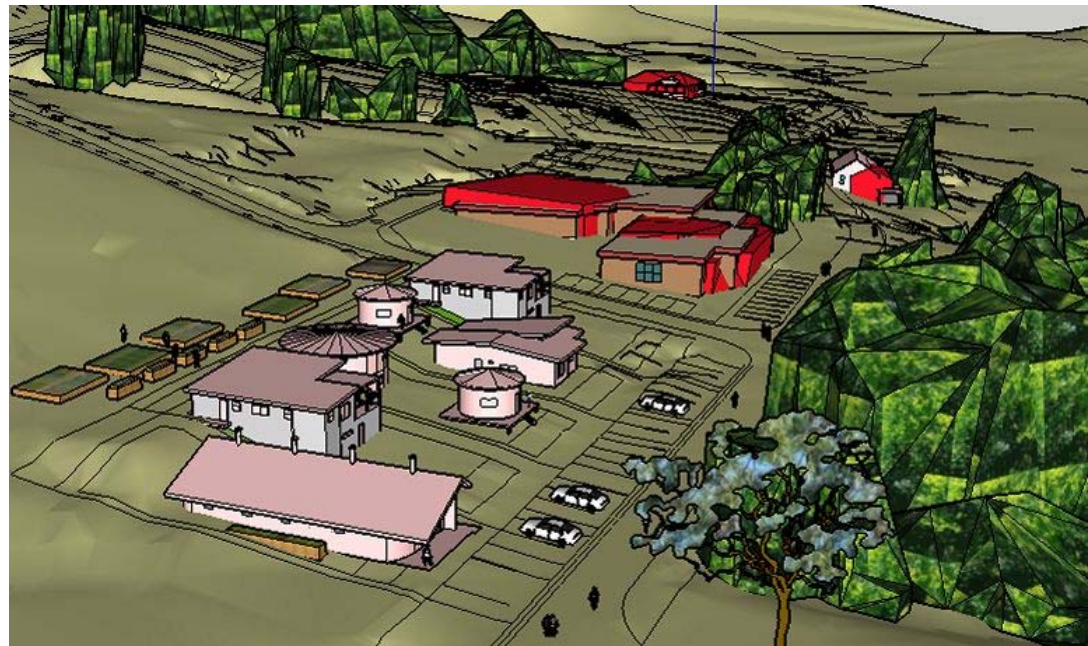
BRP: Building Review Panel
 SDA: Sustainable Design Appraiser
 CA: NEV Community Association
 CCC: central coast council



Site & Neighbourhood Analysis

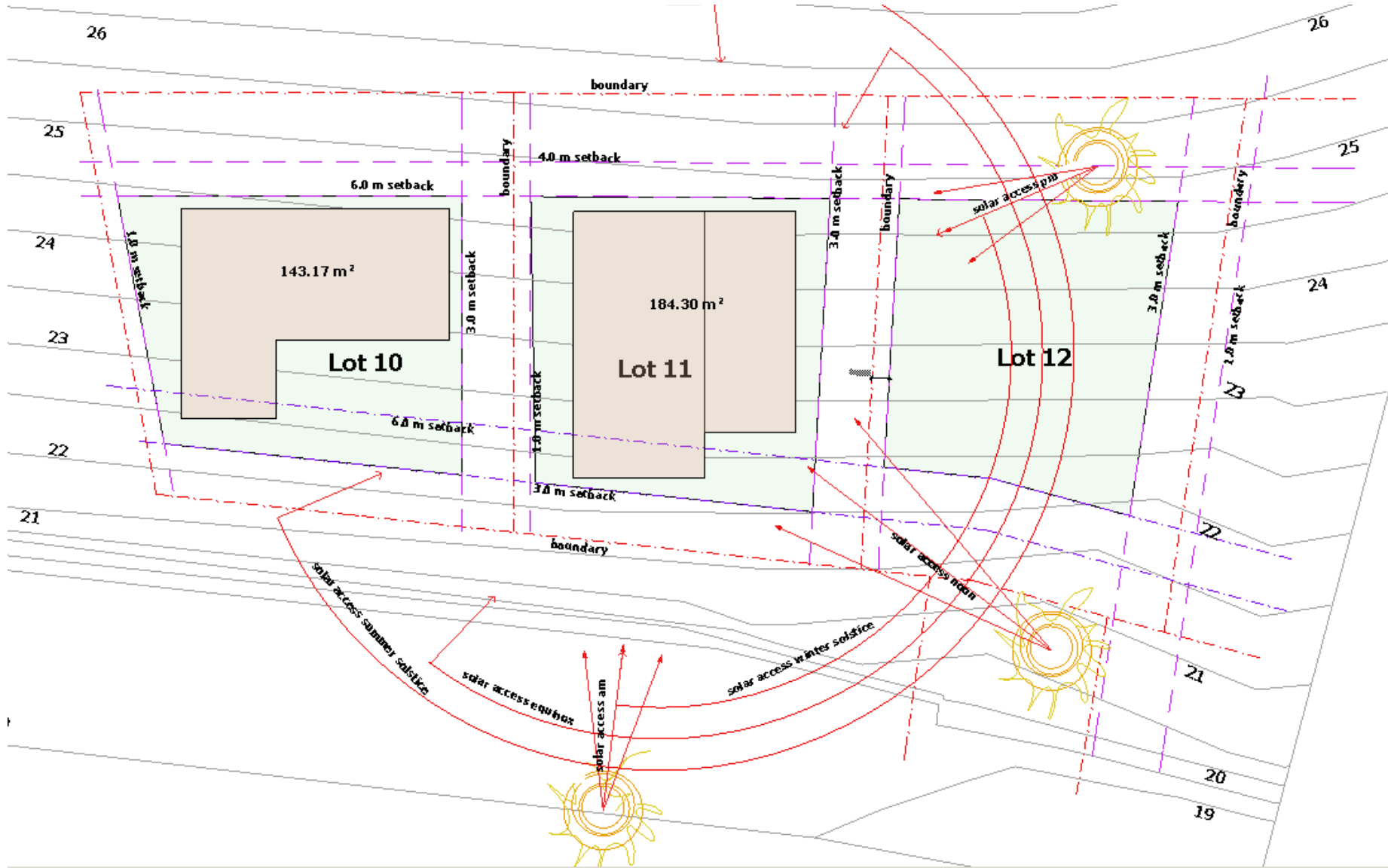
Neighbourhood Agreement covering :-

- Solar Access
- Hill Thallis and Council setbacks and controls,
- Common Gardens
- Building Height and Volume





Site & Neighbourhood Analysis





Site & Neighbourhood Analysis

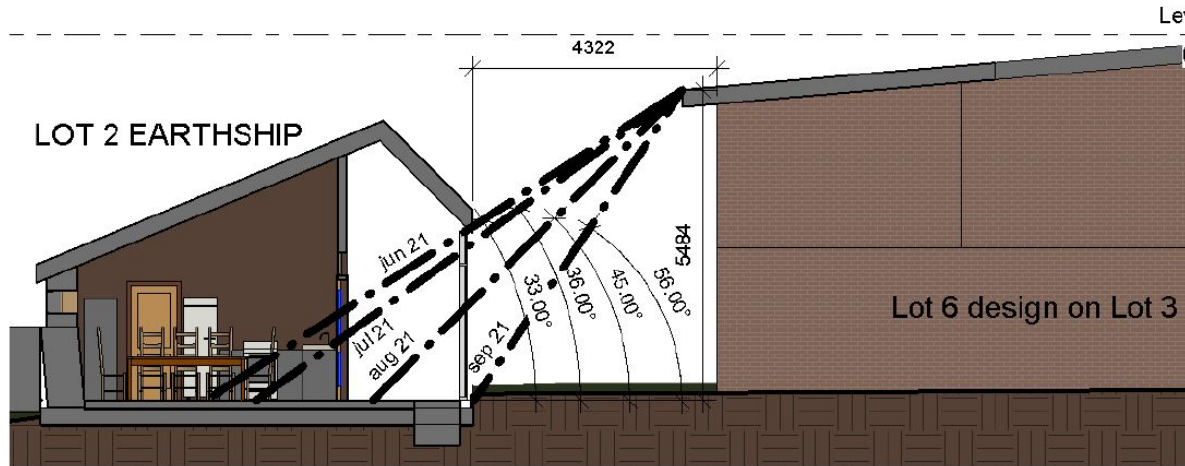


Figure 1 - Section View showing shade lines from winter solstice to equinox

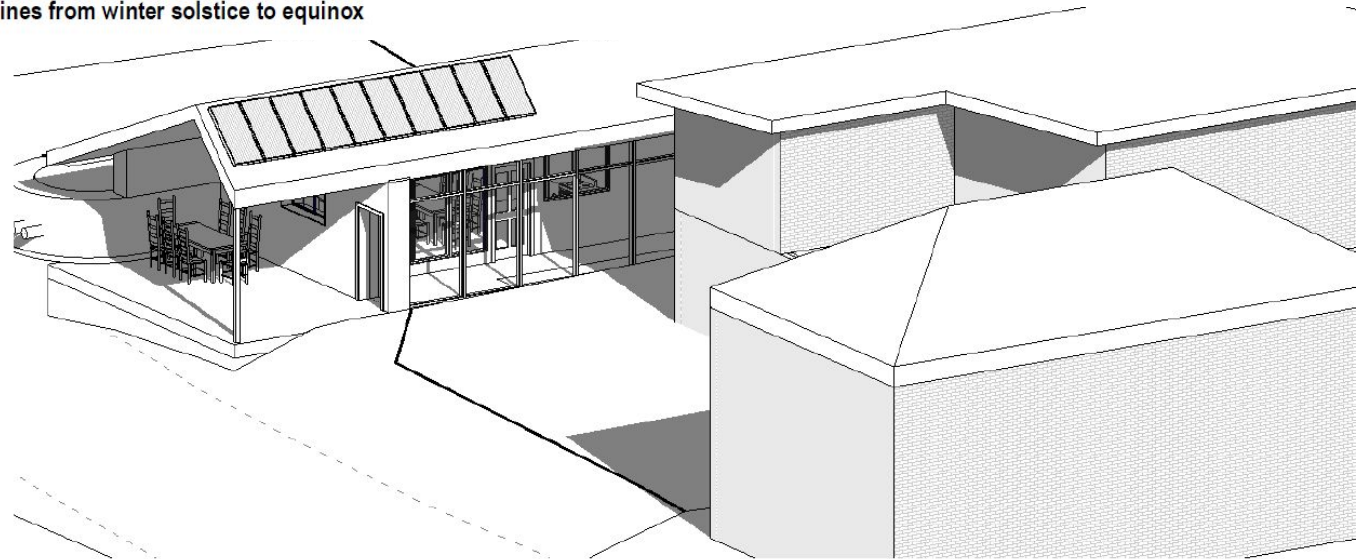
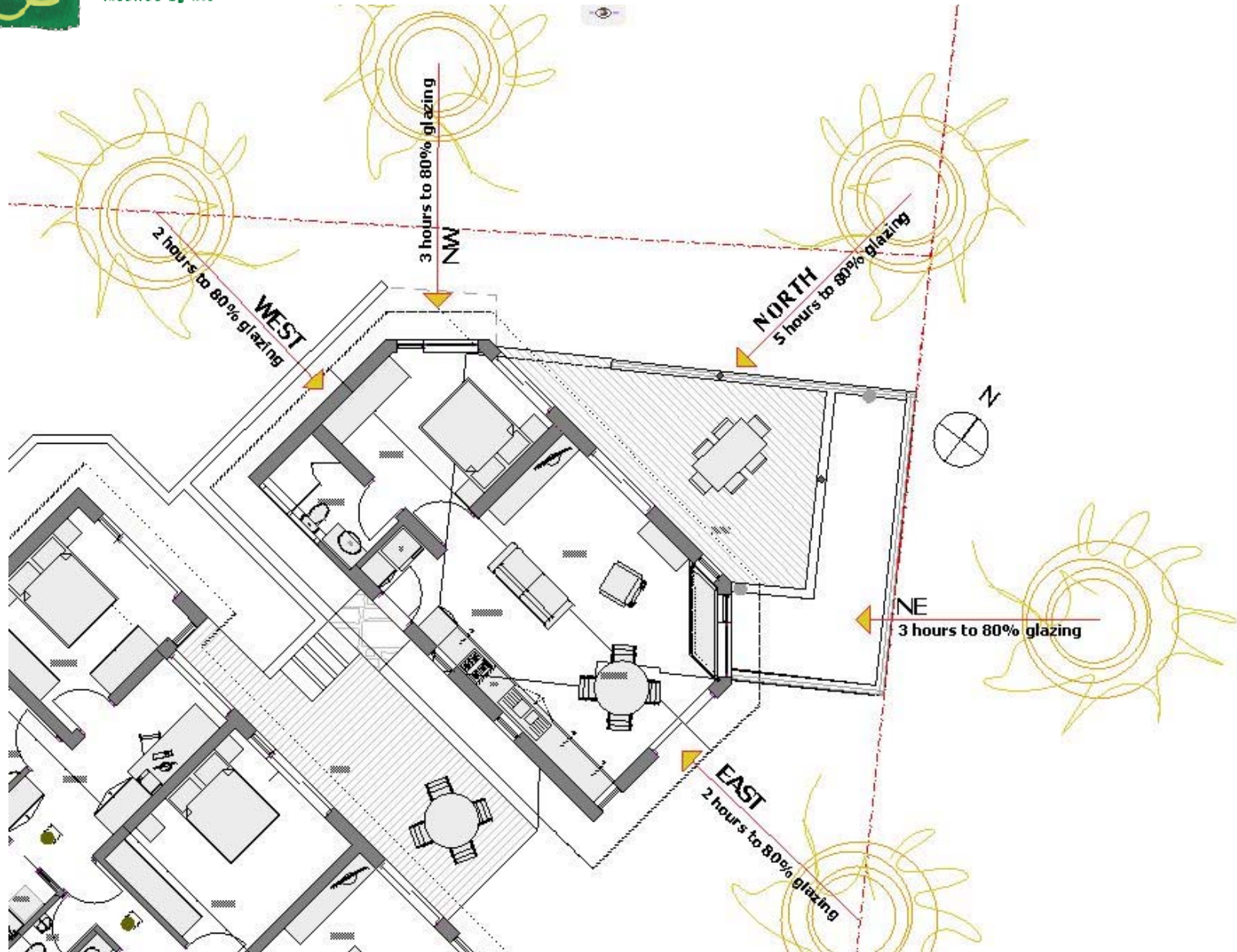


Figure 2 - 3D view showing 12noon shading on winter solstice



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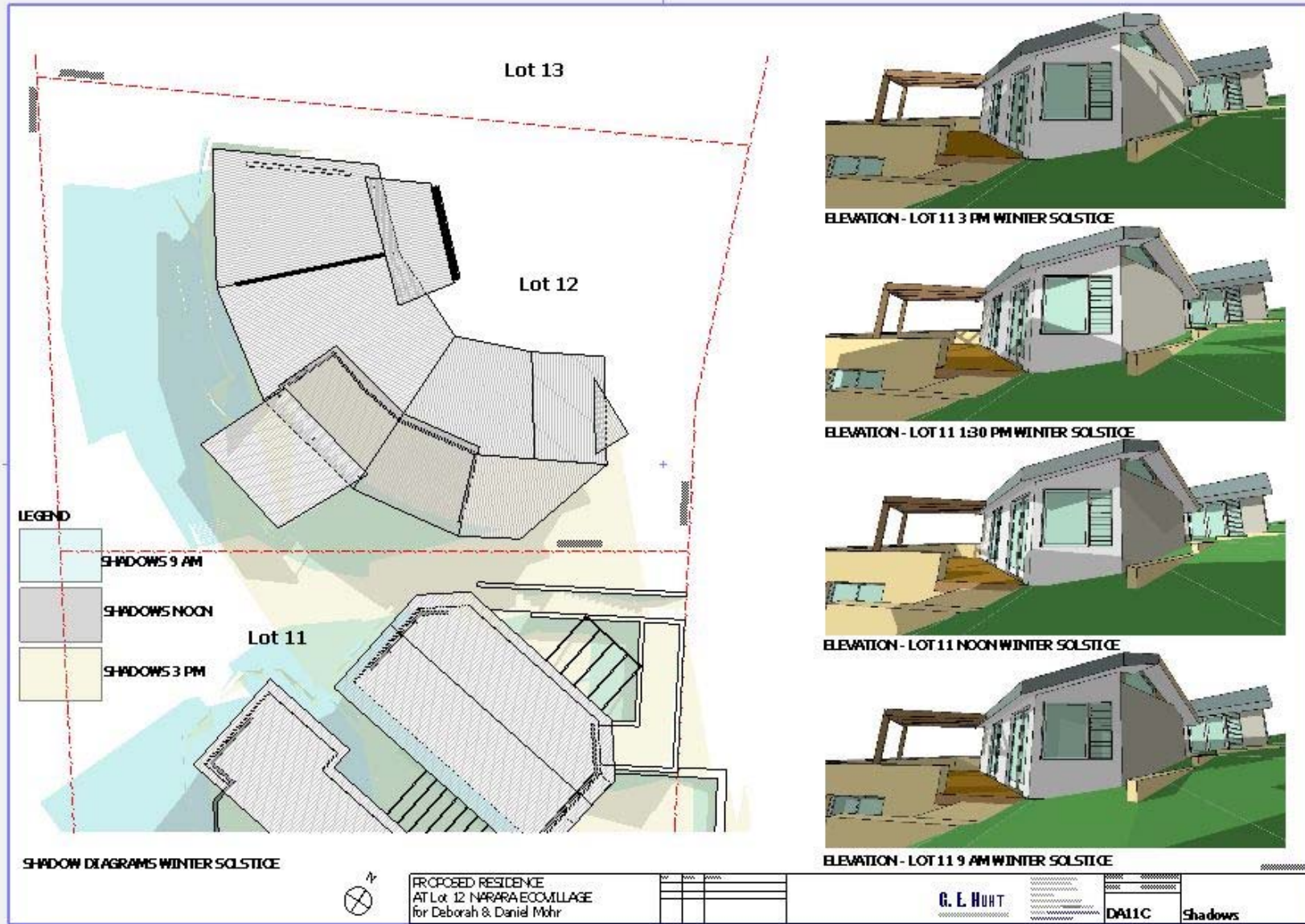
Solar Access





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Shadow diagrams





Approval Documents

Council DA Application documents

- Owners and CMS approval
- Statement of Environmental Effects
- Survey Plan
- Site Plan/Site Analysis
- Character Statement
- **BASIX Certificate**
- **Floor Plans, Elevations & Sections**
- **Schedule of External Finishes**
- Extent of Cut and Fill Plan
- **Landscape Plan**
- **Waste Management Plan**
- Stormwater Management Plan
- Erosion & Sediment Control Plan
- Bushfire Report
- Shadow Diagrams (two storey only)
- Water & Sewer Plan

NEV BRP Panel documents

- Neighbourhood agreement
- Shadow diagrams (all houses)
- **NatHERS Certificate**
- **Access statement**
- **NEV Rating Tool Assessment**
- **Energy Efficiency Assessment**
(for items not covered under BASIX)
- **Building material design statement**
- **Indoor Environment Quality statement**
- **Innovation Strategy statement**
(if opted for)

Prior to Construction/Construction Certificate

- Builder's details
- Structural engineering details
- **Construction Management Plan**



Building Standards Categories

- BASIX - www.planningportal.nsw.gov.au/planning-tools/basix
- water
- energy
- materials
- waste
- indoor environment
- other
- innovation





NEV Rating Tool (Scoresheet)

- 70% min. reduction of BASIX baseline
- Mandatory Items
 - 70 points out of 100 in Scoresheet (without Bonus)
 - Min. 7 stars NatHERS thermal comfort rating
 - Renewable Energy – to meet annual demand
- Weightings and Points
- Help
- No of Bedrooms





Bonus Points

- Innovation
 - earth ships
 - phase change materials
 - alternative energy sources
 - new materials or equipment
- Food production
- Open design presentation





NEV Rating Tool

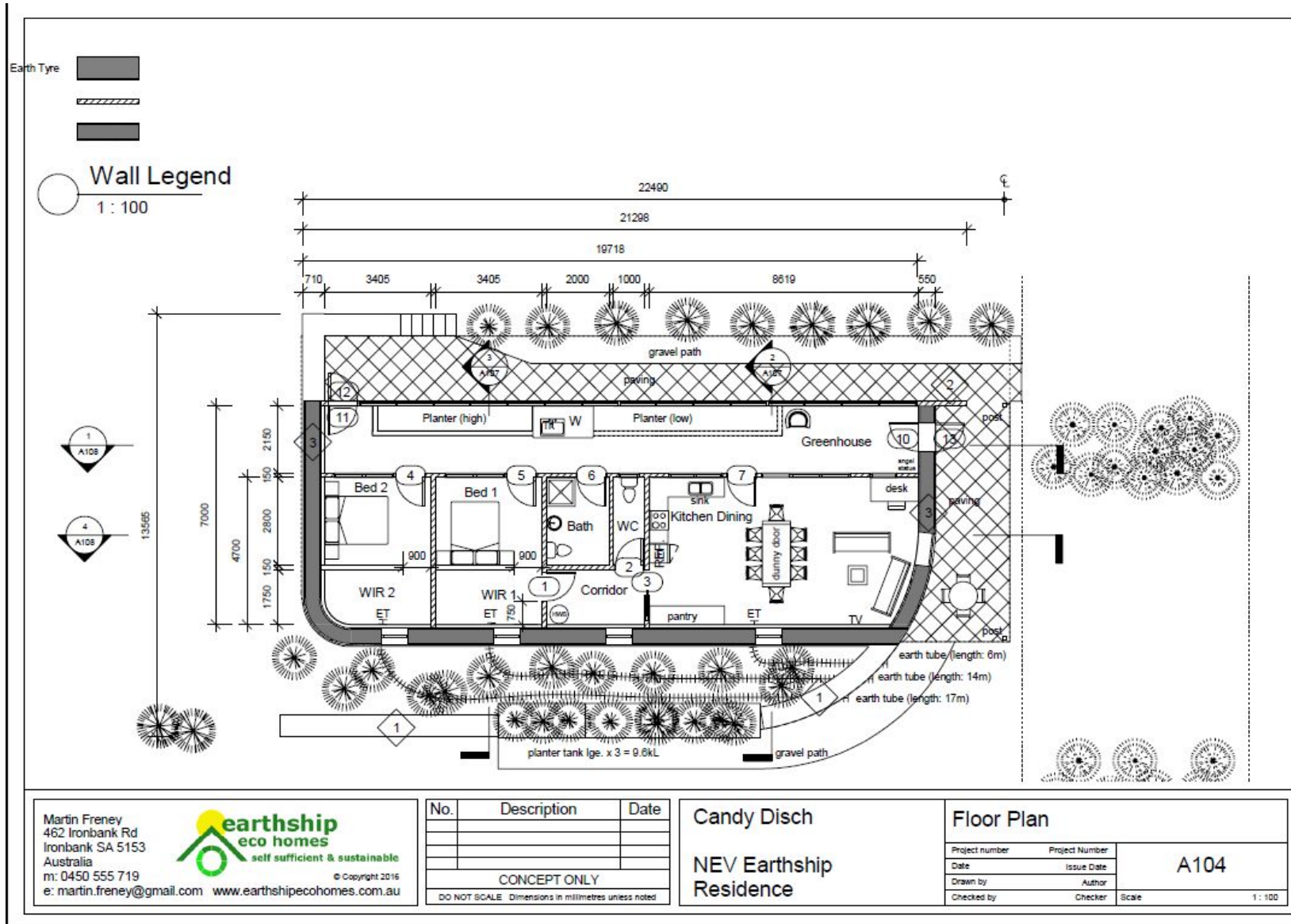
Date printed = 7/11/2016
Version date = 07.11.2016, modified by GEHunt for review report

BSWG Scoresheet Draft, Ver 6 Report review.xlsx
Scoresheet

No.	Category	Sub-category	Goal	Criteria	WEIGHTING POINTS (%age)	Enter your value here	Units	YOUR SCORE	Instruction	Further help (Links to appropriate section of user guide)
					Number of bedrooms =			3	Please enter the number of bedrooms including studios	
					Your progressive score without bonuses is =			82		
1	WATER	Potable water usage	Reduce drinking water use	Water efficient devices Water effective landscaping	15	34	BASIX points	16	Create a BASIX file and enter the data progressively until you reach the Fixtures tab under the Water. Complete your selection for fixtures on this page and then hit the 'Calculate' button. Enter the Basix Water score at this point into the Scoresheet before proceeding to the next tab	Fixtures
2		Other Basix water items	Water conservation, re-cycle and re-use	40% water score in BASIX Mandatory Stormwater & greywater management Rainwater tanks Swimming pools	4	60	BASIX points	6	A pass in Basix is a mandatory requirement for this scoresheet. It is essential to have a minimum of 40 Basix points to pass Basix. Enter the Basix result after pressing "Calculate" on the ALTERNATIVE WATER tab. The score depends on the difference between this line and line 1.	Alternative Water
3		Water efficient appliances	Washing machines & dishwashers are not included in Basix		1	No		1	Enter:- * 0.5 points if using a washing machine with WELS rating of 4 stars or better * 0.5 points if using a dishwasher with WELS rating of 4 stars or better	
		Sub-Total All water items	Sub-total for lines 1 to 3 =	20			Sub-total	23		
4	ENERGY	Building Thermal Performance*	Decrease Energy consumption	Mandatory	15	7	NATHERS Stars	15	A minimum of 7-stars is a mandatory requirement for this scoresheet. Enter your NATHERS assessor's NATHERS star rating.	Star_Rating
5		Energy Efficient devices	To increase energy efficiency		5	10	NEV points	5	Enter:- * 2 points if using a reverse cycle air conditioning set of 3.5 stars or better, 1 point if 2.5 stars or better. * 1 point if you will NOT be installing an active climate system, 1 point if you will be installing ceiling fans in bedrooms and living rooms * 2 points if using a fridge/freezer of 3.5 stars or better, 1 point if 2.5 stars or better * 1 points if using a dishwasher of 4 stars or better or not having one at all, 1 point if 3.5 stars or better * 1 point if using a clothes washer of 4 stars or better or not having one at all, 1 point if 3.5 stars or better * 2 points if using a clothes dryer of 4 stars or better or not having one at all, 1 point if 2.5	Line 5
		Sub-Total All energy	Sub-total for lines 4 to 5 =	20			Sub-total	20		
6		Renewal Energy	Photovoltaic panels	Mandatory Provide at least 2 kW for the first bedroom and 1kW for each additional bedroom	5	4.0	kW	5.0	A special case exists for 4 bedroom houses where 4.5 kWp is permissible otherwise a 3-phase electrical connection and inverter would apply. The expectation cell calculates the required power which is at least 2.0 Kw for the first bedroom and an additional 1.0 Kw for each additional bedroom.	Renewable Energy
7				PV set larger than required	3	0.0	kW	0.0	Enter the surplus over and above the minimum requirement of the "2 plus 1" rule. The yield is 1 point per additional Kw up to 3 Kw, thereafter it is only half a point.	Additional_PV
8		Peak Power Demand	Reduce summer and winter peak load	Fixed standby switches or timers. Energy monitoring system. Remote control system. Smart metering. SmartGrid switch-off on high demand. Battery storage system	7	3	NEV points	3.0	Enter:- * 1 point if smart meter installed has occupant interface or can connect to energy monitoring system * 1 point if having a Smart phone app to remotely control peak demand and can link to fixed appliances installed. * 1 point if permitting switch-off on high demand. * 1 point if fixed stand-by switches or timers on critical appliances are installed * 3 points if installing a battery system * 2 points if installing a battery system within 5 years of obtaining approval	Peak Energy
		Sub-Total All energy	Sub-total for lines 6 to 8 =	35			Sub-total	28		



Plans, Elevations & Sections



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No.	Description	Date
CONCEPT ONLY		
DO NOT SCALE Dimensions in millimetres unless noted		

Candy Disch
NEV Earthship Residence

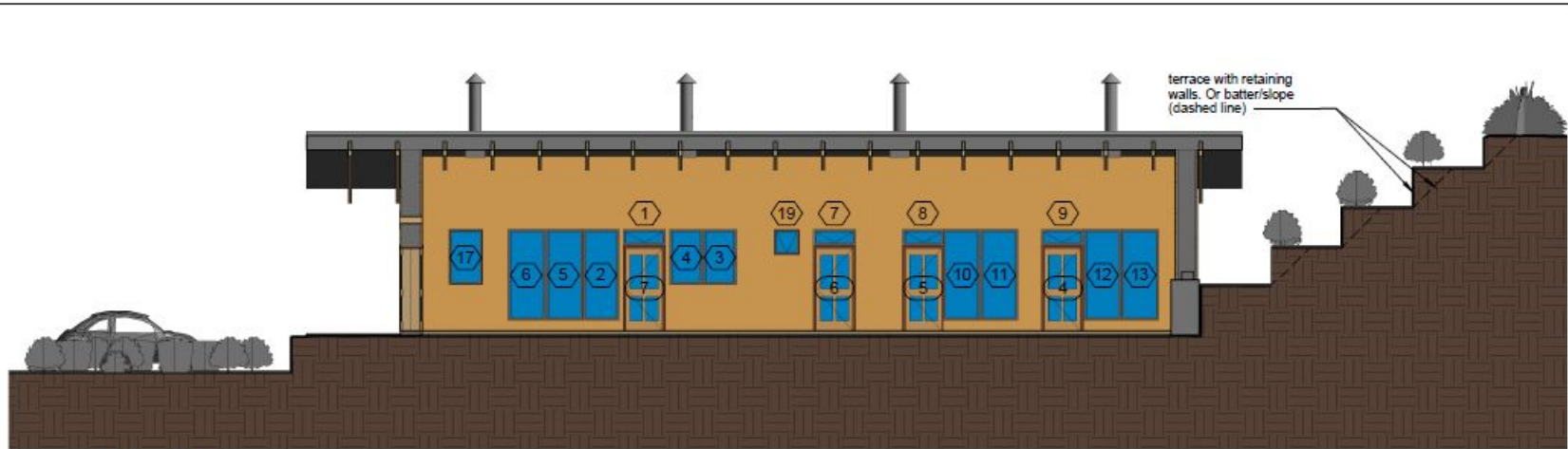
Floor Plan			
Project number	Project Number	A104	
Date	Issue Date		
Drawn by	Author		
Checked by	Checker		
		Scale	1 : 100

01-Nov-16 11:27:28 AM



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Plans, Elevations & Sections



1 Section 1
1:100



4 Section 4
1:100

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No.	Description	Date
CONCEPT ONLY		
DO NOT SCALE Dimensions in millimetres unless noted		

Candy Disch
NEV Earthship
Residence

Sections

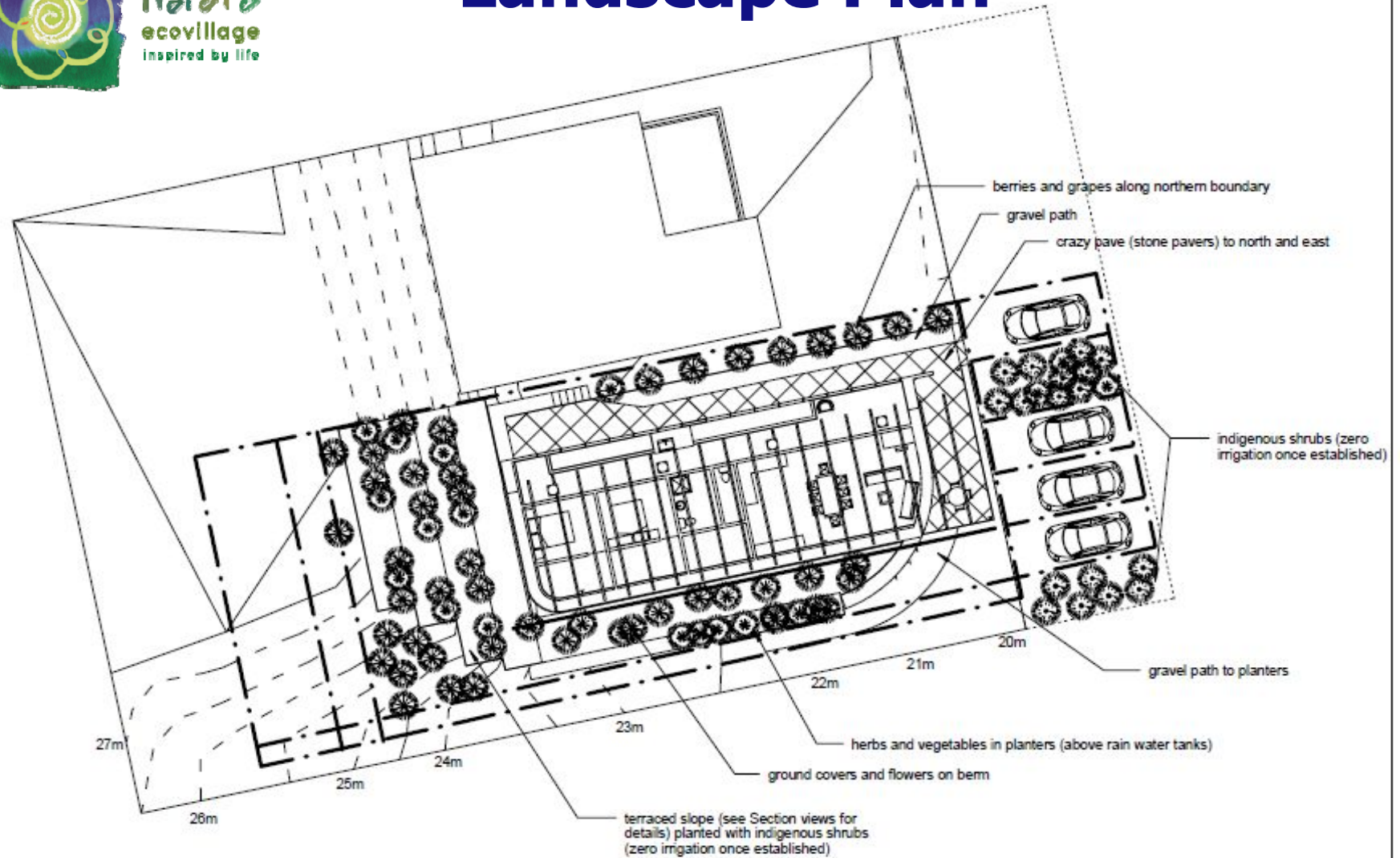
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Date	Issue Date	
Drawn by	Author	
Checked by	Checker	Scale
		1:100

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Landscape Plan



No.	Description	Date
CONCEPT ONLY		
DO NOT SCALE Dimensions in millimetres unless noted		

Candy Disch
NEV Earthship
Residence

Landscaping

Project number	Project Number	A103	
Date	Issue Date		
Drawn by	Author		
Checked by	Checker	Scale	1 : 200



Schedule of External Finishes

EXTERNAL FINISHES							
CLD01	Cladding - MgO sheet	A	Slab edge (Type A only).	As shown	Unpainted	INEX	10mm Wallboard
CLD02	Cladding -Vertical	A,B & C	External upper walls	As shown	Natural	WeatherTex	WeatherGroove 150 Vertical, natural.
CLD03	Cladding - MgO sheet	A,B & C	External wall	As shown	Unpainted	INEX Steve Taylor 0419 269 279	INEX 12mm WallBoard 3000 x 600 Horizontal install 10mm Expressed joints
DP01	Downpipes	A,B & C	Downpipes	As shown	Woodland Grey	Blue Scope Steel distributor	Colorbond 100 Ø round downpipe
GU	Guttering	A,B & C	Guttering	As shown	Woodland Grey	Blue Scope Steel distributor	Colorbond 150 Half Round
GUG	Gutter leaf gaurds	A,B & C	Gutter leaf gaurds	As shown	to match GU	Builders choice	
MDR01	Metal Roofing	A,B & C	Roof	As shown	Zincalume	Blue Scope Steel distributor	Custom Orb
TMB01	Decking	A	Deck	As shown	Sealed (clear) see Painting P13	INEX	16mm INEX ExpressBoard www.inex.com.au
	Pavers	A,B & C	Patio	As shown	Mist Eco	Amber Tiles	Eco Pave 400 x 300 x 50
EL01	Soffit	A,B & C		As shown	Raw	INEX	MgO sheet 6mm Square or aris edge**
EL02	Fascia	A,B & C		As shown	Raw	INEX	MgO sheet 6mm Square or aris edge**



BASIX Certificate

BASIX[®] Certificate

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

Multi Dwelling

Certificate number: 712627M

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 18/09/2014 published by the Department. This document is available at www.basix.nsw.gov.au

Secretary
Date of issue: Friday, 24 June 2016
To be valid, this certificate must be lodged within 3 months of the date of issue.



Project summary		
Project name	N10 Narara Cluster Housing	
Street address	25 Research Road Narara 2250	
Local Government Area	Gosford City Council	
Plan type and plan number	deposited 1126998	
Lot no.	13	
Section no.	-	
No. of residential flat buildings	0	
No. of units in residential flat buildings	0	
No. of multi-dwelling houses	18	
No. of single dwelling houses	0	
Project score		
Water	✓ 63	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 99	Target 40

Certificate Prepared by
Name / Company Name: Envirotecture
ABN (if applicable): 49078853577



BASIX Changes – July 2017

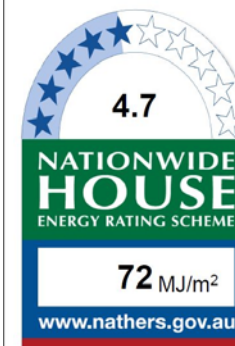
- <https://www.planningportal.nsw.gov.au/planning-tools/basix>
- *From 1st July there will be an increased stringency within BASIX*
- *Energy score will go from min. 40% reduction to 50%*
- *Thermal Comfort will go from 4 star to 6 star*
- *Beta test site available for testing*
- <https://beta.dev.basix.nsw.gov.au/basixcms/>

BASIX[®]



Thermal Comfort Rating

- **NatHERS**– Federal government – www.nathers.gov.au
- **Accredited assessor** - ABSA
<https://www.absa.net.au/find-an-assessor>
or BDAV - <http://bdav.org.au/find>
- **Brief them properly** - not just compliance
but minimum 7 stars, may need more than one through
- **Checklist** – all materials, colours, windows, lights, neighbours
- **Designer**– involve early in the process
- **Final Certification**
- **Later revisions**



Certificate no.: 0000109231
Assessor Name: Graham Hunt
Accreditation no.: 20127
Certificate date: 28 May 2015
Dwelling Address:
2 Burrawong AVENUE
MOSMAN, NSW
2088

www.nathers.gov.au





Thermal Comfort Rating

- *Interim Software Report and Result*
- *Default and custom windows*
- *Type A & B windows*
- *Check specification on drawings*
- *Check downlights and exhaust fans*

With a warming climate a 7 star rating now, could equate to only a 6 star rating in the future!

P R E V I E W

Interim Simulation Result
*****NOT FOR RATING**
 Run: Base

NOT FOR RATING	PROJECT DETAILS	NOT FOR RATING
Project Name:		File Name: Jago.PRO
Postcode: 2250		Climate Zone: 15
Design Option: 1 -300 rammed earth		
Description:		

NOT FOR RATING	Client Details	NOT FOR RATING
Client Name:		
Phone:	Fax: -	Email:
Postal Address:		
Site Address: 25----- Research Road, Narara 2250, NSW		Exposure: Suburban
Council submitted to (if known by assessor): Central Coast		

NOT FOR RATING	Assessor Details	NOT FOR RATING
Assessor Name: Graham Hunt		Assessor No. 20127
Phone: 02 97980516	Fax: 02 97980516	Email: ghunt@netspace.net.au
Project Code: #298	Assessment Date: 25/05/2017	Time: 13:09:10
Assessor Signature:		

CALCULATED ENERGY REQUIREMENTS*				
Heating	Cooling (sensible)	Cooling (latent)	Total Energy	Units
8.5	43.5	12.5	64.5	MJ/m ² .annum

* These energy requirements have been calculated using a standard set of occupant behaviours and so do not necessarily represent the usage pattern or lifestyle of the intended occupants. They should be used solely for the purposes of rating the building. They should not be used to infer actual energy consumption or pricing costs. The settings used for the simulation are shown in the building data report.

AREA-ADJUSTED ENERGY REQUIREMENTS				
Heating	Cooling (sensible)	Cooling (latent)	Total Energy	Units
6.4	32.8	9.4	48.7	MJ/m ² .annum
Floor area	conditioned: 72.3 m ²	unconditioned: 67.3 m ²	garage: 0.0 m ²	

BAND RESULT
7.1

Area-adjusted band score thresholds									
Band 1	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7	Band 8	Band 9	Band 10
349	232	159	114	86	67	50	34	19	6



Thermal Comfort Rating

THERMAL COMFORT SPECIFICATION		
Item	Material	Insulation
External Walls	300 mm th. Hempcrete fixed to stud wall framing with lime render both sides medium colour external	None
	Weathertex fixed to battens with breathable membrane fixed to stud wall framing with MGO board internally dark colour external	R2.5 high density polyester insulation
Internal walls	350 mm th. rammed earth wall	None
	MGO lined stud walls -	R2.5 high density polyester insulation
Roof	Metal deck with, light colour	Breathable membrane – CSR ProctorWrap HTR
Ceilings	Plasterboard	R4.0 polyester insulation
Floor structure	Concrete	
Floor finishes	Burnished concrete , lino to bedrooms, kitchen, hall, tiles to wet areas	N/A
Windows	Sliding windows, Sliding glazed doors, louvre and fixed windows - timber framed with single clear glass - U value = 5.4 SHGC = 0.63 or equivalent Awning and casement windows, hinged glazed doors - timber framed with single clear glass - U value = 5.4 SHGC = 0.56 or equivalent All external doors and windows to be fitted with draught excluding weather stripping	
Lighting	No recessed downlights	
General	Insulation, services and sealing of the building to be in accordance with BCA NSW 3.12. All exhaust fans to be max. 180 mm dia. be sealed or fitted with damper and exhaust through roof	



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Energy Efficiency Assessment

BASIX SPECIFICATION	
Item	Description
Hot Water system	Sanden 250l. electric heat pump
NEV Recycled Water	connected to toilets, clothes washer and garden
Water Fixtures	Showers max. 7.5 l/minute Toilets 4 star WELS rating Taps 5 star WELS rating
Heating and Cooling	Ceiling fans only
Lighting	LED fixtures throughout
Renewable Energy	4kW PV system connect to NEV mini-grid
Appliances	Induction cook tops, electric ovens, ventilated fridge spaces, external & sheltered clotheslines

ENERGY EFFICIENCY	
Item	Description
Hot Water system	Electric heat pump fitted with timer to run during middle of day
Heating and Cooling	Ceiling fans only
Lighting	LED fixtures throughout 3.5 W/m ² for interior of houses 2.8 W/m ² for verandah, balcony or deck of houses, 2.0 W/m ² for outbuildings (sheds and garages).
Renewable Energy	Battery system to be connected to PV system within 5 years
Appliances	Fridge/freezer of 2.5 stars - Model No. Dishwasher 4 stars - Model No. Clothes washer 4 stars - Model No. Clothes dryer 2.5 stars - Model No.



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Building Materials Statement

BLUESCOPE COLORBOND ROOF SHEETING HAS A 20YEAR WARRANTY

POLYESTER ROOF/WALL INSULATION IS 100% RECYCLED FROM PET BOTTLES

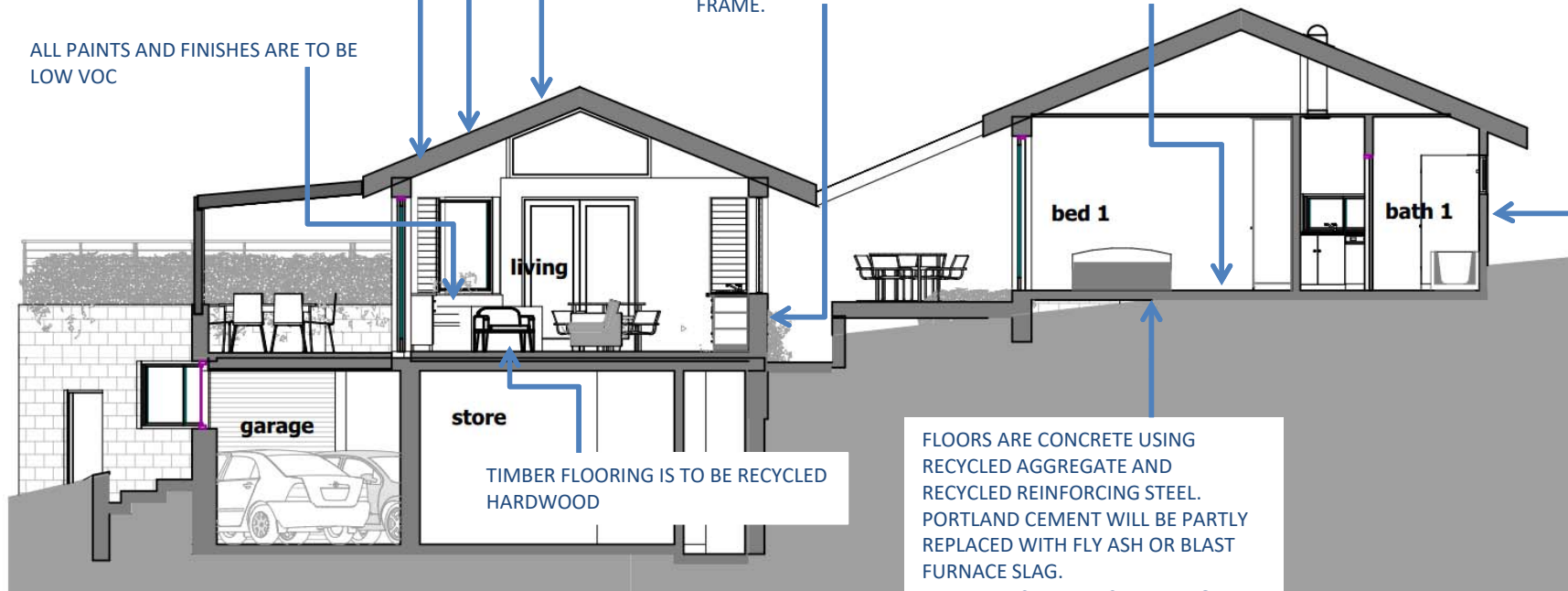
ALL PAINTS AND FINISHES ARE TO BE LOW VOC

PV PANELS WILL HAVE A 25 YR WARRANTY

MOST EXTERNAL WALLS ARE HEMPCRETE WITHIN A TIMBER FRAME.

WEATHERTEX CLADDING USES WASTE MATERIALS FROM THE TIMBER INDUSTRY AND HAS A 20YEAR WARRANTY

LINOLEUM FLOORING IS MADE FROM NATURAL, RENEWABLE MATERIALS (LINSEED OIL, JUTE, AND FLAX)



TIMBER FLOORING IS TO BE RECYCLED HARDWOOD

FLOORS ARE CONCRETE USING RECYCLED AGGREGATE AND RECYCLED REINFORCING STEEL. PORTLAND CEMENT WILL BE PARTLY REPLACED WITH FLY ASH OR BLAST FURNACE SLAG. THE BURNISHED FINISH WILL NOT DETERIORATE.



Waste Management Plan

5. CONSTRUCTION DESIGN (All Types of Developments)

Outline how measures for waste avoidance have been incorporated into the design, material purchasing and construction techniques of the development (refer to Section 7.2.14 of the DCP):

Materials

Most of the fill under the concrete slab will be salvaged from the excess spoil left over from excavation. Recycled bricks will be used for all subfloor, foundation and retaining walls laid in lime mortar to allow for ease of disassembly. External paving will also use recycled bricks or pavers. The polyester insulation used in the roof and the lightweight walls is 100% recycled from PET bottles.

As the majority of materials to be used will be purchased in bulk or as recycled, second hand materials, the amount of packaging that comes with the materials will be minimised.

Lifecycle

Colorbond roof sheeting will have 30 year warranty and 20 years for the Colorbond gutters and downpipes. Hempcrete is fire and termite resistance and is provided all round with decent eaves to ensure weather protection and so a long life is expected. The roof sheeting and framing will all be screw fixed to allow for disassembly and recycling at end of life or when renovations occur. Similarly the Weathertex cladding will also be screw fixed and can be easily removed and be available for re-use. All structural steel work shall be bolt connected not welded and so can be easily disassembled for recycling. Rammed earth walls can be broken up and the resultant material available to be used as fill. Recycled bricks used foundation and retaining walls will be laid in lime mortar to allow for ease of demolition and cleaning for re-use.

Detail the appropriate needs for the ongoing use of waste facilities including the transfer of waste between the residents or tenancy units, the servicing of waste location and frequency of waste transfer and collection. If truck access is required then engineering details are required.

An on-site compost bin and worm farm will process all vegetative food waste and some green waste. A

four bin sorting facility will be provided within the house which will allow greenwaste for compost and

worm farm to be separated and for residual waste to be separated from recyclable waste.

Residual and recycled waste will be taken to the central collection point in Narara Ecovillage

	Reuse	Recycling	Disposal	
Type of waste generated	Estimate Volume (m3) or Weight (t)	Estimate Volume (m3) or Weight (t)	Estimate Volume (m3) or Weight (t)	Specify method of on site reuse, contractor and recycling outlet and/or waste depot to be used
Excavation material	160 m3			If suitable used on site as fill under concrete slabs and terraces, given to adjacent sites for re-use
Timber (specify)	3m3	3 m3		Reuse on site as mulch if not treated
Concrete		3m3		Delivered to Recycled Concrete Products West Gosford for crushing
Bricks		2 m3		Delivered to Recycled Concrete Products West Gosford for crushing or re-sale
Tiles		1 m3		Delivered to Recycled Concrete Products West Gosford for crushing
Metal (specify)		2m3		Sent to Fairhaven Services Point Clare for salvaging
Glass				
Plasterboard (offcuts)		2m3		Sent to REGYP Kurnell through NEV recycling scheme
Fixtures and fittings				If complete sent to Building Recyclers Depot Warnervale
Floor coverings		0.5 m3		Only timber - if suitable sent to Building Recyclers Depot Warnervale
Packaging (used pallets, pallet wrap)		4 m3	1.5 m3	Timber, cardboard, hard plastic to NEV recycling scheme, soft plastic to Council collection
Garden organics		1.5 m3		Used in NEV central compost or as mulch to common gardens
Containers (cans, plastic, glass)		0.5 m3		Recycled through central collection with NEV recycling scheme
Paper/cardboard		1 m3		Saved for mulch for common gardens or recycled through NEV recycling scheme
Residual waste			2 m3	Collected through NEV central collection point for collection by Council
Hazardous/special waste (specify)				



Construction Management Plan

TRAFFIC CONTROL

Traffic control works shall be installed & maintained in accordance with AS 1742.3 (Traffic Control Devices for Work on Roads) &/or RTA Traffic Control at Work Sites Manual Version 4/06/2010. Local Constraints may not allow signs and devices to be placed as exactly in accordance with this plan. Judgement will therefore be necessary to place signs and devices as close as possible to the spacing indicated.

Signs should generally be placed 1.0 m clear of the travelled path. For works exceeding longer than 2 weeks, long term signs (Truck turning signs) shall be mounted on poles 2.2m above ground level. Signs are to be Class 1 Retro-reflective (Day/Night) and positioned adjacent to the footpath or high on gal. posts in clear view of passing motorists. At the end of the days shift or when traffic controllers are absent for an extended period, cover or remove signs.

WASTE RESOURCE MANAGEMENT

Generation of waste on site to be kept to a minimum. Before sending any waste to landfill, check to see if the left over material can be used on site, placed in any community recycling facilities within the Ecovillage or be used by other building contractors working in the village. Contact your Narara Registered Assessor to get information on recycling facilities/opportunities within the village.

EXISTING TREES AND VEGETATION

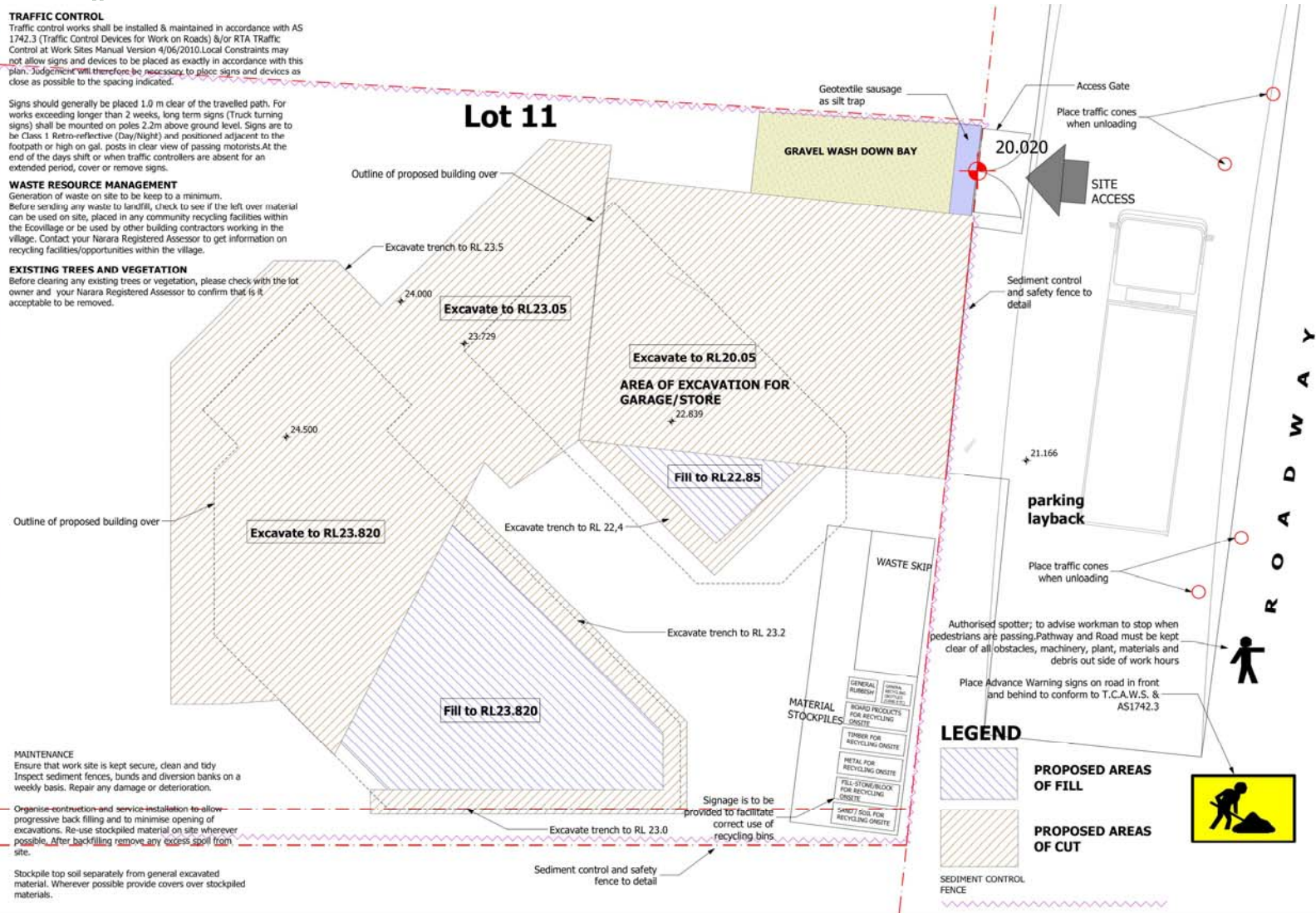
Before clearing any existing trees or vegetation, please check with the lot owner and your Narara Registered Assessor to confirm that it is acceptable to be removed.

MAINTENANCE

Ensure that work site is kept secure, clean and tidy. Inspect sediment fences, bunds and diversion banks on a weekly basis. Repair any damage or deterioration.

Organise construction and service installation to allow progressive back filling and to minimise opening of excavations. Re-use stockpiled material on site wherever possible. After backfilling remove any excess spoil from site.

Stockpile top soil separately from general excavated material. Wherever possible provide covers over stockpiled materials.



REV	DATE	NOTES

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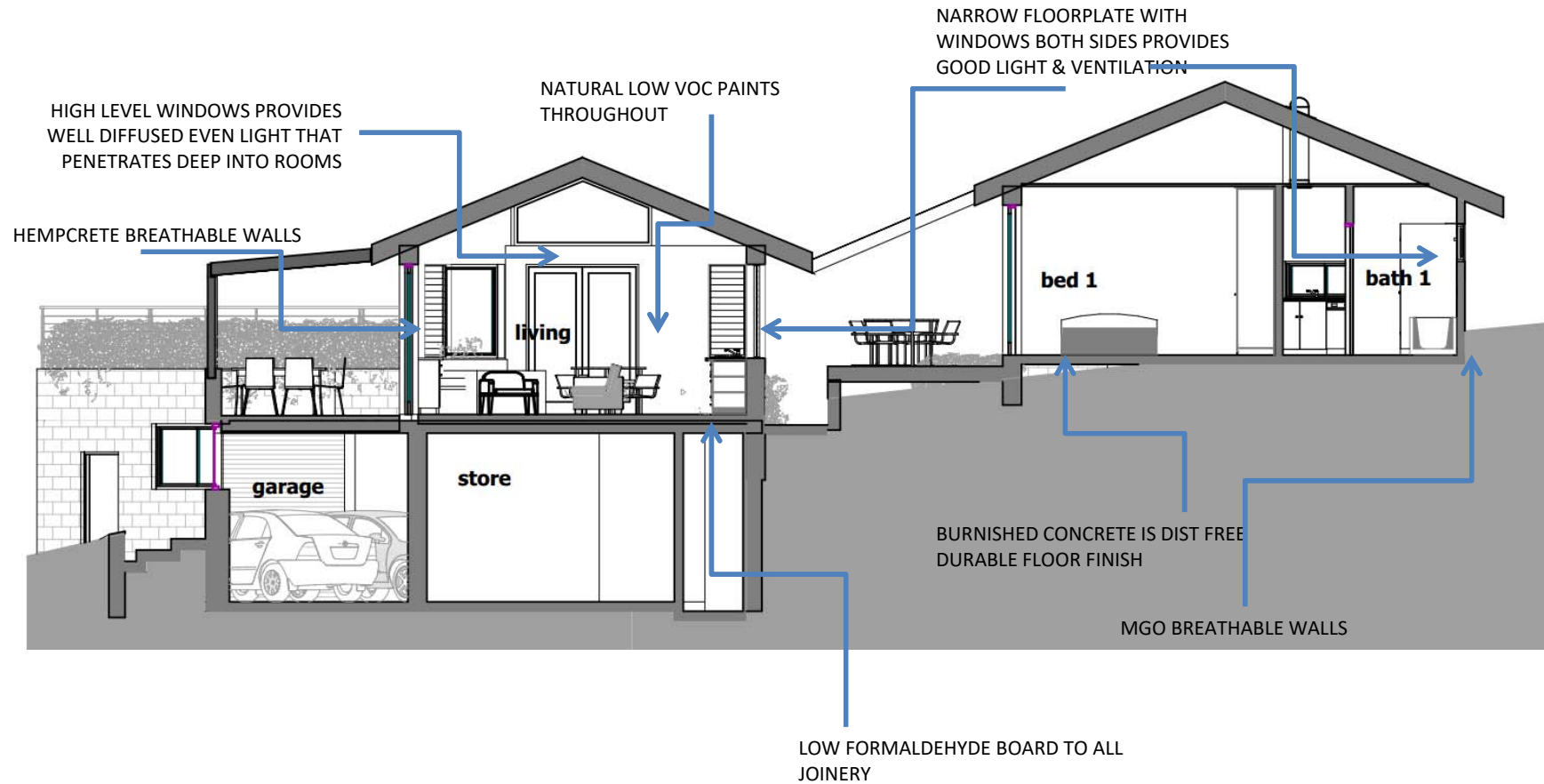
SCALE 1:100
DATE 25/05/2017
25

CONSTRUCTION MANAGEMENT PLAN



**Narara
ecovillage**
inspires by life

Indoor Environment Quality





Access Statement

ACCESS & LIVABILITY STATEMENT			
To be read in conjunction with Livable Housing Design Guidelines - http://livablehousingaustralia.org.au/			
Item	Requirement	Provided	Level achieved
Dwelling Access	Provide a safe, continuous pathway from the street entrance and/or parking area to the dwelling entrance	Not applicable as average ground slope is steeper than 1:14. However pathway with grades no greater than 1:10 is provided to rear exit and connecting to common pathway in Common garden	N/A
Dwelling entrance	There is at least one level (step-free) entrance into the dwelling to enable home occupants to easily enter and exit the building	Landing provided is > 1.5 m x 1.5 m and covered by roof, door is > 900 mm wide with level transition	Platinum
Car parking	Where the parking space is part of the dwelling access it should allow a person to open their car doors fully and easily move around the vehicle.	Not applicable as no car parking is provided on the site	N/A
Internal doors & corridors	Internal doors and corridors facilitate comfortable and unimpeded movement between spaces.	Internal width of hallways = 1.2m Clear openings of doors = 900 mm Level transition at all doorways	Platinum
Toilet	The ground (or entry) level has a toilet to support easy access for home occupants and visitors.	1.2 m clear between side walls of toilet room. 1.2m clear circulation space forward of toilet pan, toilet in corner for future fixing of grab rails	Gold
Shower	The bathroom and shower is designed for easy and independent access for all home occupants.	Shower recess 0.9m x 0.9 m clear internal, 1.2m x 1,2m clear circulation space forward of hobless entry to shower, shower in corner for future fixing of grab rails	Gold
Reinforcement of bathroom and toilet walls	The bathroom and toilet walls are built to enable grab rails to be safely and economically installed.	Additional noggings placed in all toilet and shower room walls	Silver
Internal Stairways	Where installed, stairways are designed to reduce the likelihood of	Continuous handrail fixed to one side of staircases	Silver



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Innovation Strategy Statement



INNOVATION STATEMENT	
Item	Description
Proposed Innovation	Earth covered house – rear of house to be excavated into the ground with berm walls and entire roof to be a green roof
Has this been done before?	There have been numerous houses built like this throughout Australia but we are not aware of any being built on the Central Coast.
Why is it innovative?	There has been a lot of publicity about green roofs and earth covered buildings but they are rarely built especially in a suburban setting. Often they are only built in rural or bush settings.
Environmental Benefits	<ul style="list-style-type: none"> • Improved thermal performance inside home due to shading effect and increased thermal mass • Reducing heat and glare reflectivity and improved transpiration from the plants growing on the roof that help to reduce the urban heat island effect • Much improved bushfire resilience for the structure and its occupants • Increased bio-diversity due to the plants and micro-habitat that can grow on the roof • Reduced stormwater run-off compared to a conventional hard roof • Feeling of –well-being for occupants being better connected with the natural surroundings • Excellent acoustic performance within the home which also reduces the noise impact on neighbours • Reduced visual impact on neighbours as the house is half-buried
Environmental Impacts	<ul style="list-style-type: none"> • Increase embodied energy in the heavy structure required to hold the roof up. This is to be minimised by using recycled brick and stone in the walls. • Possible disruption to natural drainage as a result of excavation. The level of excavation is to be optimised so that the extent of cut matches the extent of fill.



NEV Rating Tool Result

NEV building standards scoresheet												Enter your numbers in column "I".	
No.	Category	Sub-category	Goal	Criteria	Initial Target %*	WEIGHTING POINTS (%age)	Expectation Based on a 120 SqM design	Enter your value here	Units	YOUR SCORE	Instruction		
16		Construction resource recovery	To reduce waste going to landfill	Construction waste reuse and recycling - Amount and types recycled; Amount of waste and destination; Design sizing & packaging	0.7	5	80	30	NEV points	1.9	Enter a percentage number as a number e.g "80", not a percentage. As will be verified from construction waste disposal receipts, enter the percentage to be recycled. Full details of the Construction Management Plan requirements can be found under "Definitions". Currently page 45.		
17	INDOOR	Indoor Environmental Quality (IEQ)	To optimise sustainability & health	Indoor air quality; natural light; acoustic comfort;		5	7	3	NEV points	2	Enter 1 point each for:- <ul style="list-style-type: none"> sufficient internal daylight in all rooms sufficient cross ventilation in each room use of low VOC paints use of low formaldehyde joinery and panel materials avoidance of dust trapping materials such as carpets, fabrics, high shelves etc noise abatement through the use of insulation (external as well as internal) breathable wall materials such as hempcrete or strawbale, breathable paints or roof construction or providing additional ventilation to roof spaces 		
18	OTHER	Other		Improve access for occupants over time; ease of adapting house for future uses; ability to withstand severe external forces	Meet liveability guidelines	5	4	3	NEV points	3.8	For the Liveability self assessment, enter:- <ul style="list-style-type: none"> 1 point if comply with 70% of Liveable Housing Silver level design guidelines 2 points if comply with Silver Certification of Liveable Housing design guidelines 3 points if comply with Gold Certification of Liveable Housing design guidelines 4 points if comply with Platinum Certification of Liveable Housing design guidelines Deduct one point from each of the last 3 items for self assessment of the Liveable Guidelines. * 1 point for resilient design through use of durable materials, enhanced strategies		
Individual House Total				Achieving a total of 70 points is mandatory		100.0	Your TOTAL SCORE is =		70	Pass level = 70, plus mandatory PV and 7 stars (if fail, message indicates Narara Ecovillage Bldg Stds*)			
19	BONUS POINTS	Innovation Innovative house designs or materials	Foster new ideas such as:- Earth ships Pre-fabricated homes Bio Fuel / Bio Mass usage Phase Change Materials for Thermal Mass	Owners to demonstrate how elements exceed Category minimums	N/A				Bonus points	0.0	This not capped but is issued at the discretion of the BRP. Please seek advice from the BRP if your proposal would be eligible to be awarded on a case by case basis by the BRP. Criteria and guidelines to be set by the BRP..		
20		Food production				3	3			0.0	Enter:- <ul style="list-style-type: none"> 1 point if 25% or more of landscaped area is food garden 2 points if 50% or more of landscaped area is food garden 3 points if 75% or more of landscaped area is food garden 		
21		Open Design presentation				3	3			0	Enter 3 points if design has been presented to the membership for sociocratic feedback		



Construction

- Briefing builder on NEV Building Standards
- Construction Management Plan
- NEV Security bond
- OH & S – site induction
- Sediment & Erosion Control
- Role of NEV SDAs
- Recycling Centre
- Bulk buying/sharing resources
- Share on social media





Homework!



- One assignment to do.
- Documents will be available on Wiki
- Send questions to BSWG – Q & A forum to be set up
- Remember it is not about getting to 70% but about scoring accurately
- Submissions to be in by Sunday 18th June
- Put your name on form being circulated for Dropbox allocation