This assessment is based on a now-expired version of the achievement standard and may not accurately reflect the content and practice of external assessments developed for 2026 onwards.
No part of the candidate's evidence in this exemplar material may be presented in an external assessment for the purpose of gaining an NZQA qualification or award.

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New Zealand Qualifications Authority

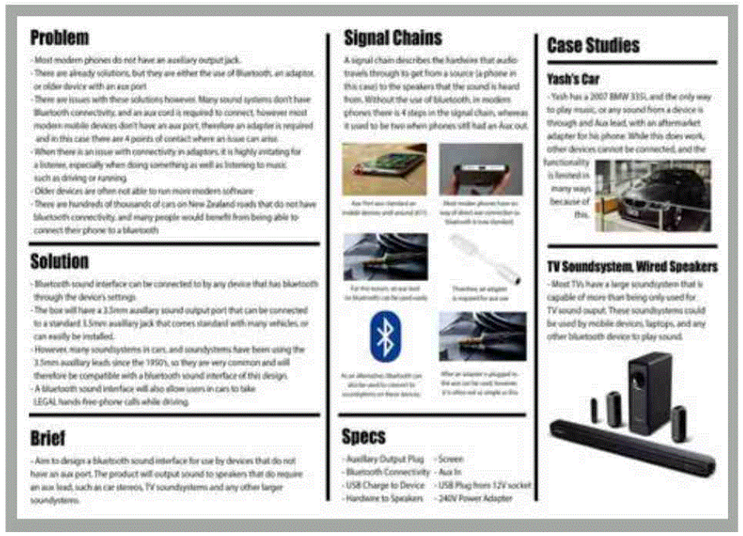
Level 2 Design and Visual Communication 2024

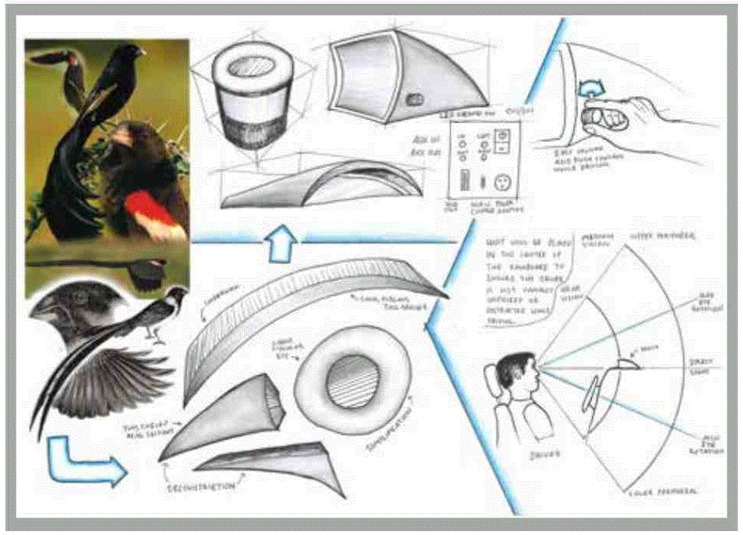
91338 Produce working drawings to communicate technical details of a design

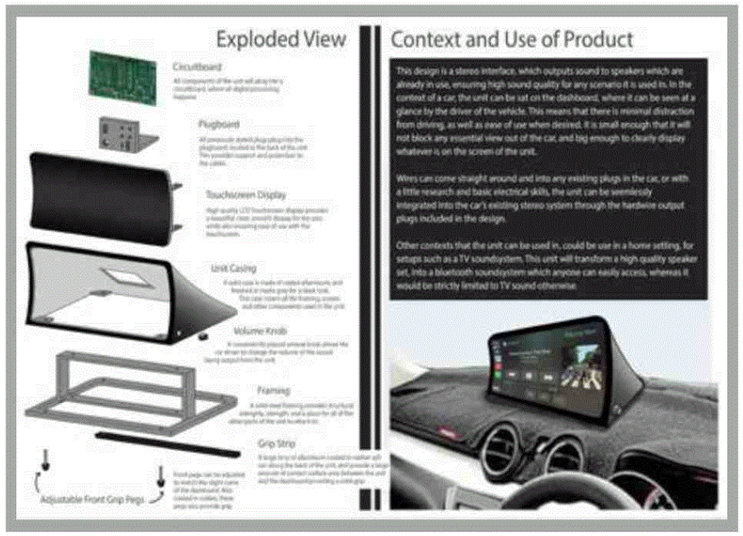
EXEMPLAR – PRODUCT DESIGN

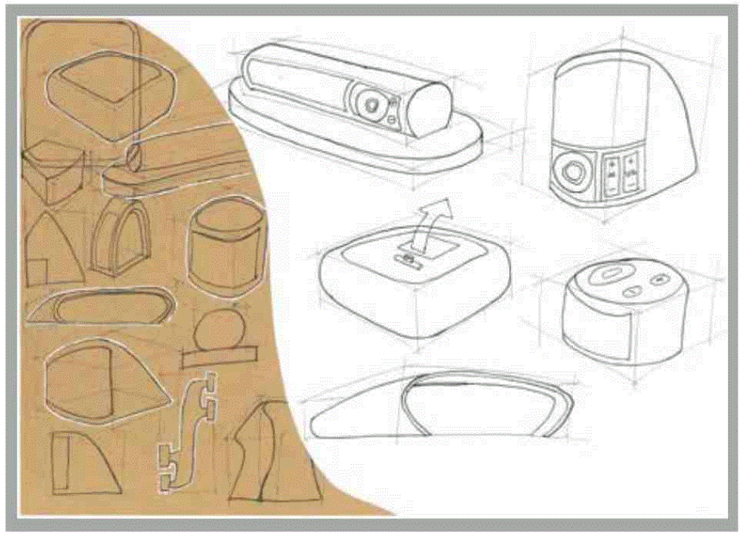
Achievement TOTAL 03

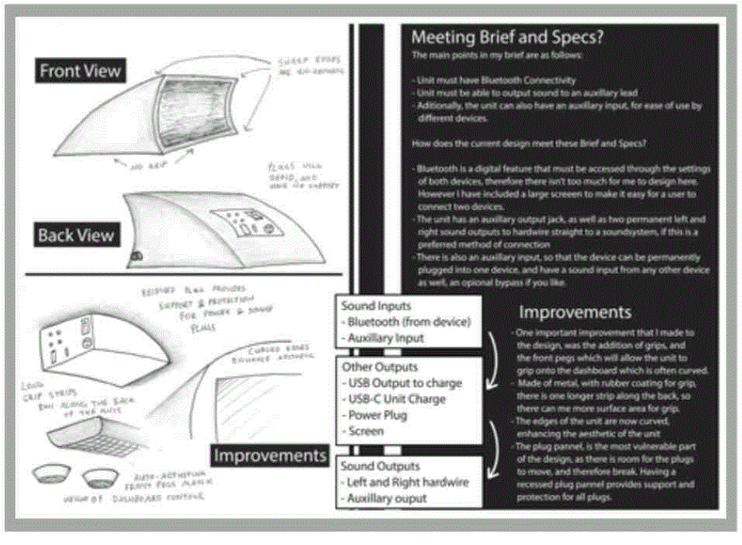
EVIDENCE


Problem
- Most modern phones do not have an auxiliary output jack.
- There are already solutions, but they are either the use of Bluetooth, an adaptor, or older device with an aux port
- There are issues with these solutions however. Many sound systems don't have Bluetooth connectivity, and an aux cord is required to connect, however most modern mobile devices don't have an aux port, therefore an adapter is required and in this case there are 4 points of contact where an issue can arise.
- When there is an issue with connectivity in adaptors, it is highly irritating for a listener, especially when doing something as well as listening to music such as driving or running.
- Older devices are often not able to run more modern software
- There are hundreds of thousands of cars on New Zealand roads that do not have bluetooth connectivity, and many people would benefit from being able to connect their phone to a bluetooth
Solution
- Bluetooth sound interface can be connected to by any device that has bluetooth through the device's settings.
- The box will have a 3.5mm auxillary sound output port that can be connected to a standard 3.5mm auxillary jack that comes standard with many vehicles, or can easily be installed.
- However, many soundsystems in cars, and soundsystems have been using the 3.5mm auxillary leads since the 1950's, so they are very common and will therefore be compatible with a bluetooth sound interface of this design.
- A bluetooth sound interface will also allow users in cars to take LEGAL hands-free phone calls while driving.
Brief
- Aim to design a bluetooth sound interface for use by devices that do not have an aux port. The product will output sound to speakers that do require an aux lead, such as car stereos, TV soundsystems and any other larger soundsystems.
Signal Chains
A signal chain describes the hardwire that audio travels through to get from a source (a phone in this case) to the speakers that the sound is heard from. Without the use of bluetooth, in modern phones there is 4 steps in the signal chain, whereas it used to be two when phones still had an Aux out.
Specs
- Auxillary Output Plug
- Bluetooth Connectivity
- USB Charge to Device
- Hardwire to Speakers
- Screen
- Aux In
- USB Plug from 12V socket
- 240V Power Adapter
Case Studies
Yash's Car
- Yash has a 2007 BMW 335i, and the only way to play music, or any sound from a device is through and Aux lead, with an aftermarket adapter for his phone. While this does work, other devices cannot be connected, and the functionality is limited in many ways because of this.
TV Soundsystem, Wired Speakers
- Most TVs have a large soundsystem that is capable of more than being only used for TV sound ouput. These soundsystems could be used by mobile devices, laptops, and any other bluetooth device to play sound.

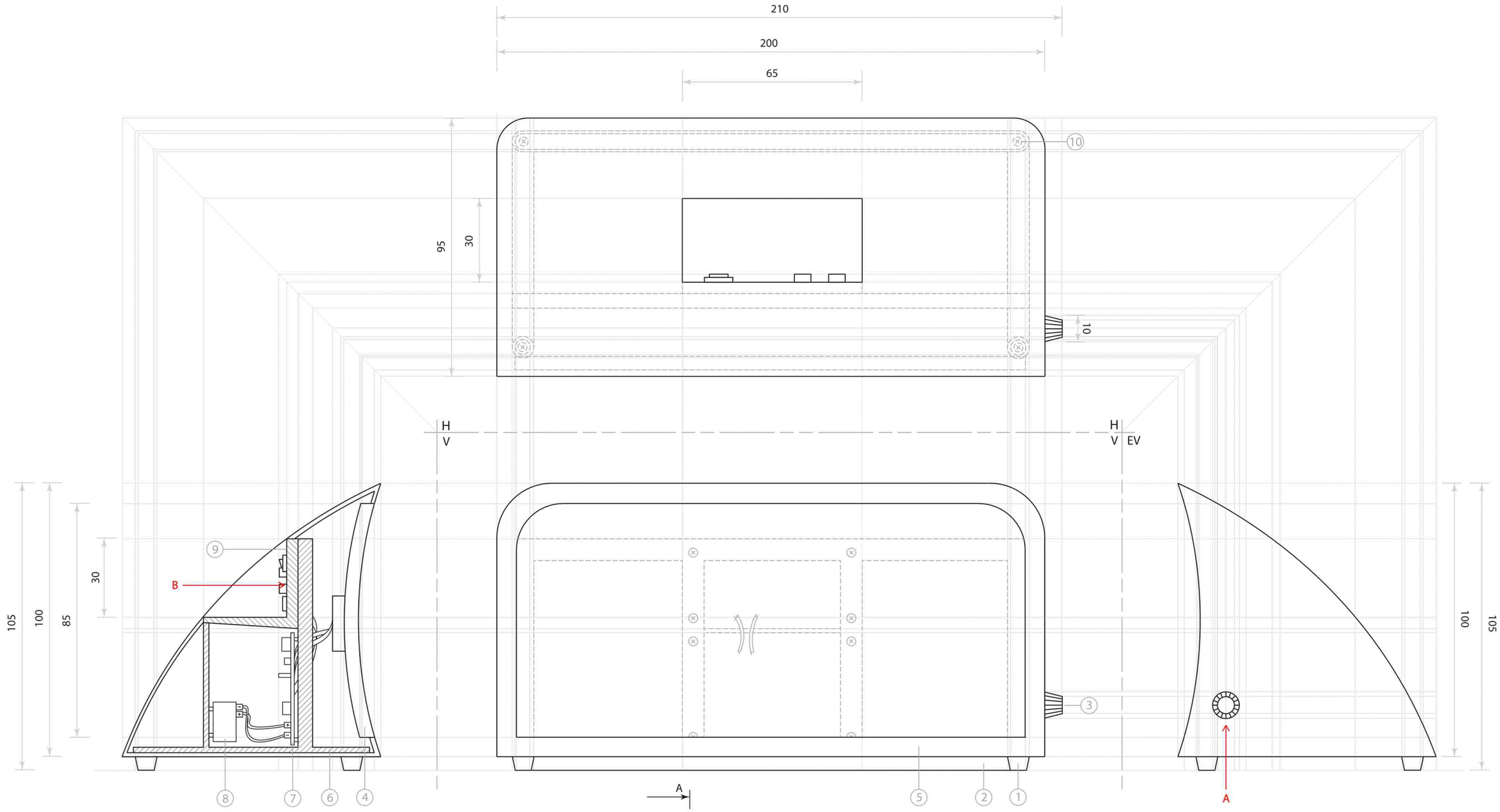



Exploded View
Circuitboard
Plugboard
Touchscreen Display
Unit Casing
Volume Knob
Framing
Grip Strip
Adjustable Front Grip Pegs
Context and Use of Product
This design is a stereo interface, which outputs sound to speakers which are already in use, ensuring high sound quality for any scenario it is used in. In the context of a car, the unit can be sat on the dashboard, where it can be seen at a glance by the driver of the vehicle. This means that there is minimal distraction from driving, as well as ease of use when desired. It is small enough that it will not block any essential view out of the car, and big enough to clearly display whatever is on the screen of the unit.
Wires can come straight around and into any existing plugs in the car, or with a little research and basic electrical skills, the unit can be seemlessly integrated into the car's existing stereo system through the hardwire output plugs included in the design.
Other contexts that the unit can be used in, could be use in a home setting, for setups such as a TV soundsystem. This unit will transform a high quality speaker set, into a bluetooth soundsystem which anyone can easily access, whereas it would be strictly limited to TV sound otherwise.



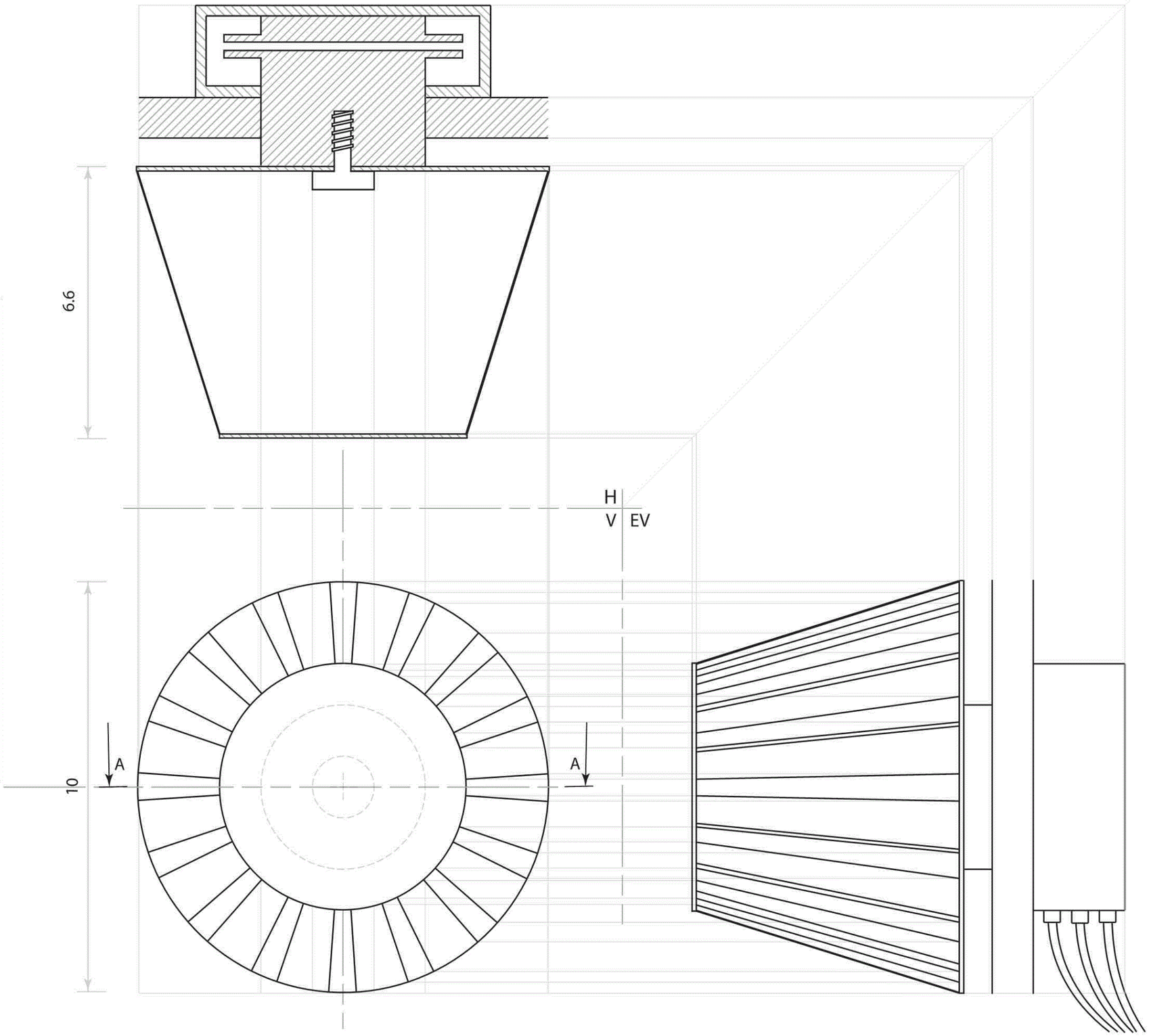

Front View
Back View
Improvements
Meeting Brief and Specs?
The main points in my brief are as follows:
- Unit must have Bluetooth Connectivity
- Unit must be able to output sound to an auxillary lead
- Aditionally, the unit can also have an auxillary input, for ease of use by different devices.
How does the current design meet these Brief and Specs?
- Bluetooth is a digital feature that must be accessed through the settings of both devices, therefore there isn't too much for me to design here. However I have included a large screeen to make it easy for a user to connect two devices.
- The unit has an auxillary output jack, as well as two permanent left and right sound outputs to hardwire straight to a soundsystem, if this is a preferred method of connection
- There is also an auxillary input, so that the device can be permanently plugged into one device, and have a sound input from any other device as well, an optional bypass if you like.
Sound Inputs
- Bluetooth (from device)
- Auxillary Input
Other Outputs
- USB Output to charge
- USB-C Unit Charge
- Power Plug
- Screen
Sound Outputs
- Left and Right hardwire
- Auxillary ouput
Improvements
- One important improvement that I made to the design, was the addition of grips, and the front pegs which will allow the unit to grip onto the dashboard which is often curved.
- Made of metal, with rubber coating for grip, there is one longer strip along the back, so there can me more surface area for grip.
- The edges of the unit are now curved, enhancing the aesthetic of the unit
- The plug pannel, is the most vulnerable part of the design, as there is room for the plugs to move, and therefore break. Having a recessed plug pannel provides support and protection for all plugs.


Playing Next
Here Comes The Sun
The Beatles
Abbey Road

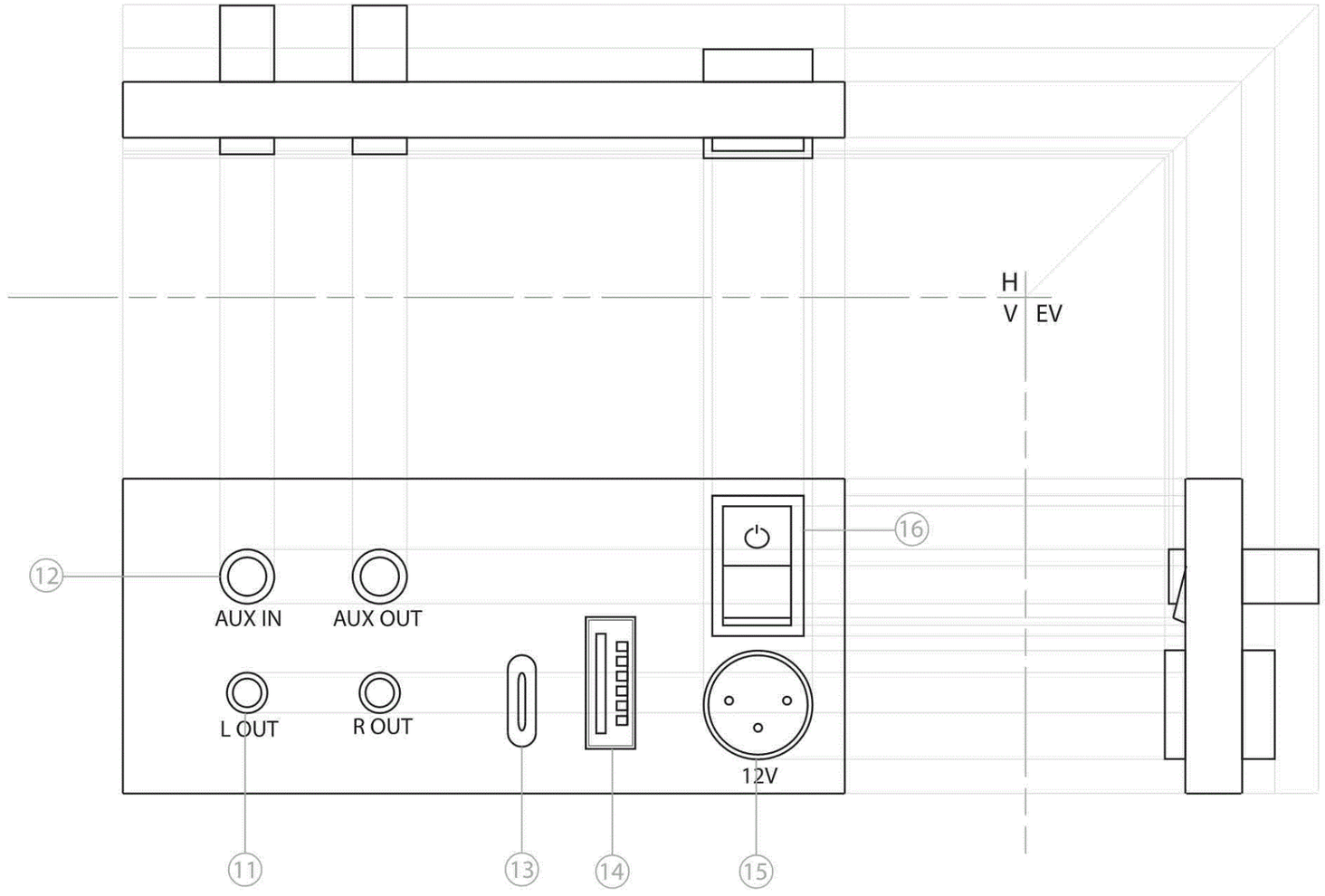


20-8-2024	SCALE 1:1	ORTHOGRAPHIC PROJECTION - BLUETOOTH SOUND INTERFACE			1 OF 3

ITEM	NAME	QTY	MATERIAL
16	ON/OFF SWITCH	1	PLASTIC AND STEEL
15	12V UNIT ADAPTER PLUG	1	INSULATED STEEL
14	USB OUTPUT PLUG	1	INSULATED STEEL
13	USB TYPE-C CHARGER	1	INSULATED STEEL
12	3.5mm AUX IN/OUT	2	INSULATED STEEL
11	RCA OUTPUT	2	INSULATED STEEL
10	SCREW	14	STEEL
9	PLUG BOARD	1	MULTIPLE COMPONENTS
8	BATTERY UNIT	1	MULTIPLE COMPONENTS
7	CIRCUIT BOARD	1	MULTIPLE COMPONENTS
6	UNIT FRAMING	1	ALIMUNUM
5	UNIT CASING	1	PLASTIC MOULD
4	LCD SCREEN	1	MULTIPLE COMPONENTS
3	VOLUME KNOB	1	STEEL
2	BACK GRIP STRIP	1	RUBBER COATED STEEL
1	FRONT GRIP PEG	2	RUBBER COATED STEEL



13-9-2024	SCALE 10:1	DETAIL VIEW A - BLUETOOTH SOUND INTERFACE - VOLUME KNOB			2 OF 3



19-9-2024	SCALE 2:1	DETAIL VIEW B - BLUETOOTH SOUND INTERFACE - PLUGBOARD			3 OF 3

Achievement – product design

Subject: Design and Visual Communication

Standard: 91338

Total score: 03

Grade score	Marker commentary
A3	The evidence for this Standard is most identifiable in the page containing the orthographic projection of the plan, elevations, and cross section. The shape and form of the object can be taken from these views; however, the small size of the section view and lack of sectioning conventions being applied correctly stops it from receiving a higher grade. The additional pages that include the volume knob and plug-board contribute little to the communication.

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Level 2 Design and Visual Communication 2024

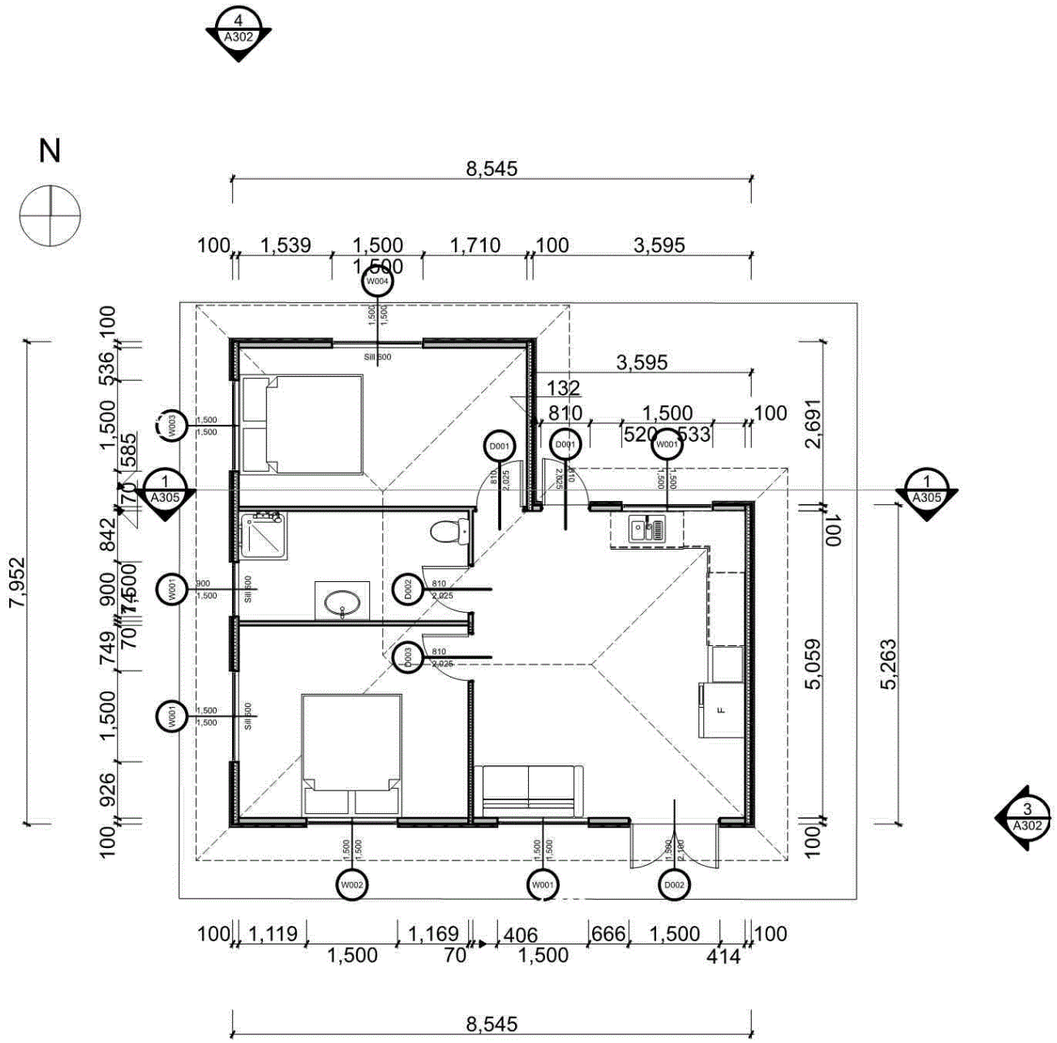
91338 Produce working drawings to communicate technical details of a design

EXEMPLAR – SPATIAL DESIGN

Achievement | TOTAL 03

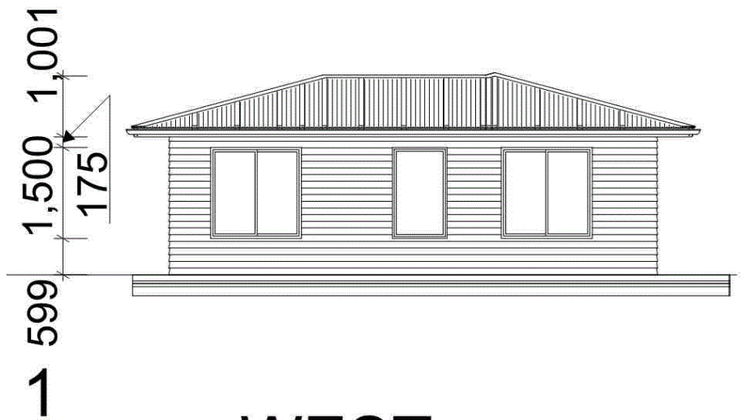
ARCHICAD EDUCATION VERSION

ALL DIMENSIONS ARE IN MILIMETERS



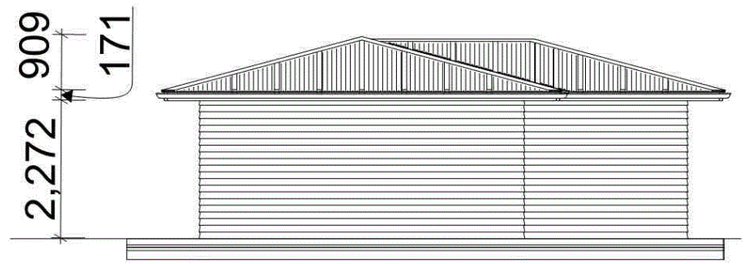
EMERGENCY HOUSING	16/09/2024	SCALE 1: 100	DRAWING1 OF 7
	ROOF CHAIN FLOOR PLAN		

ARCHICAD EDUCATION VERSION



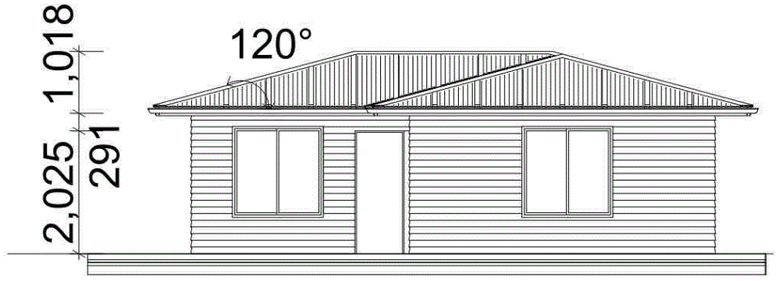
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WEST



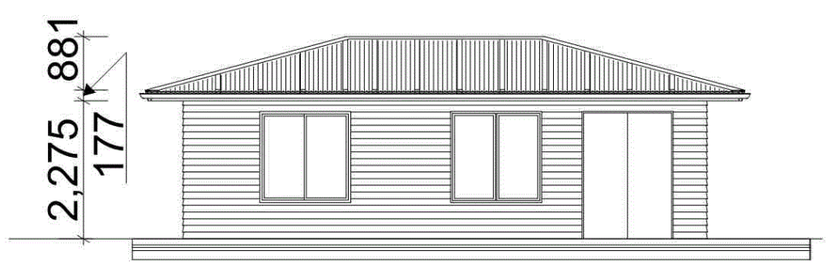
2

EAST



3

NORTH



4

SOUTH

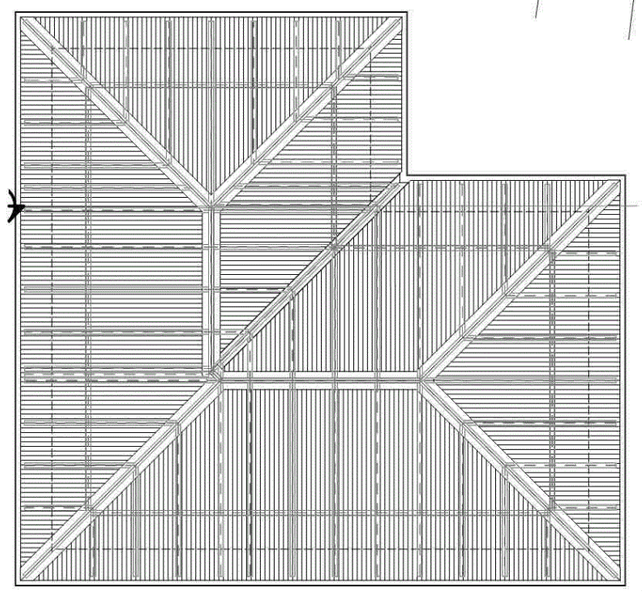
	EMERGENCY HOUSING	16/09/2024	SCALE 1: 100 ELEVATIONS	DRAWING 2 OF 7

ARCHICAD EDUCATION VERSION

POWELLS ROAD HAMILTON

N

PROPOSED DRIVEWAY



PROPOSED BULIDING

NEIGHBOURING HOUSE

EMERGENCY HOUSING	16/09/2024	SCALE 1: 100 SITE PLAN	DRAWING 3 OF 7

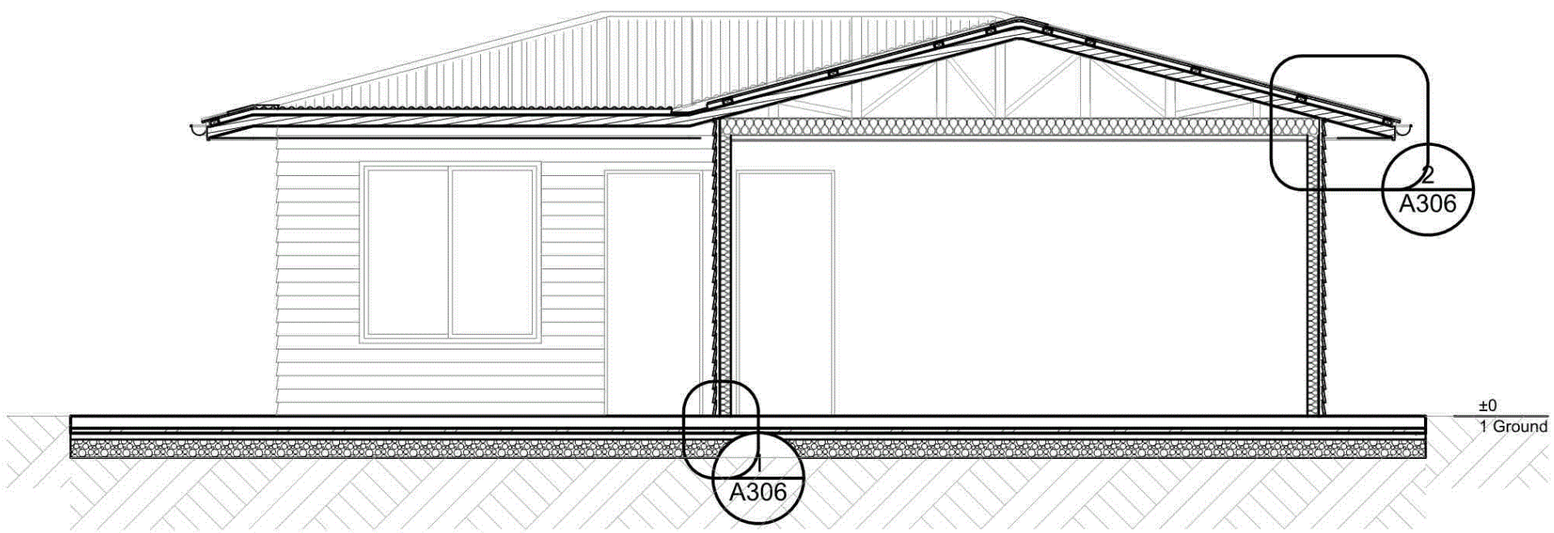






	EMERGENCY HOUSING	16/09/2024	3D PHOTOS	DRAWING 4 OF 7

ARCHICAD EDUCATION VERSION

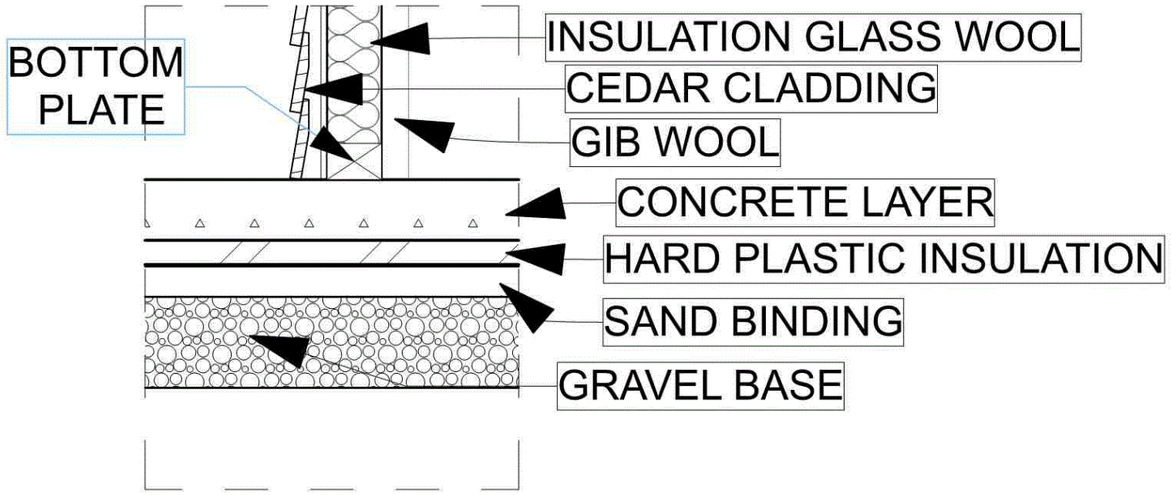


1 Section A 1:50

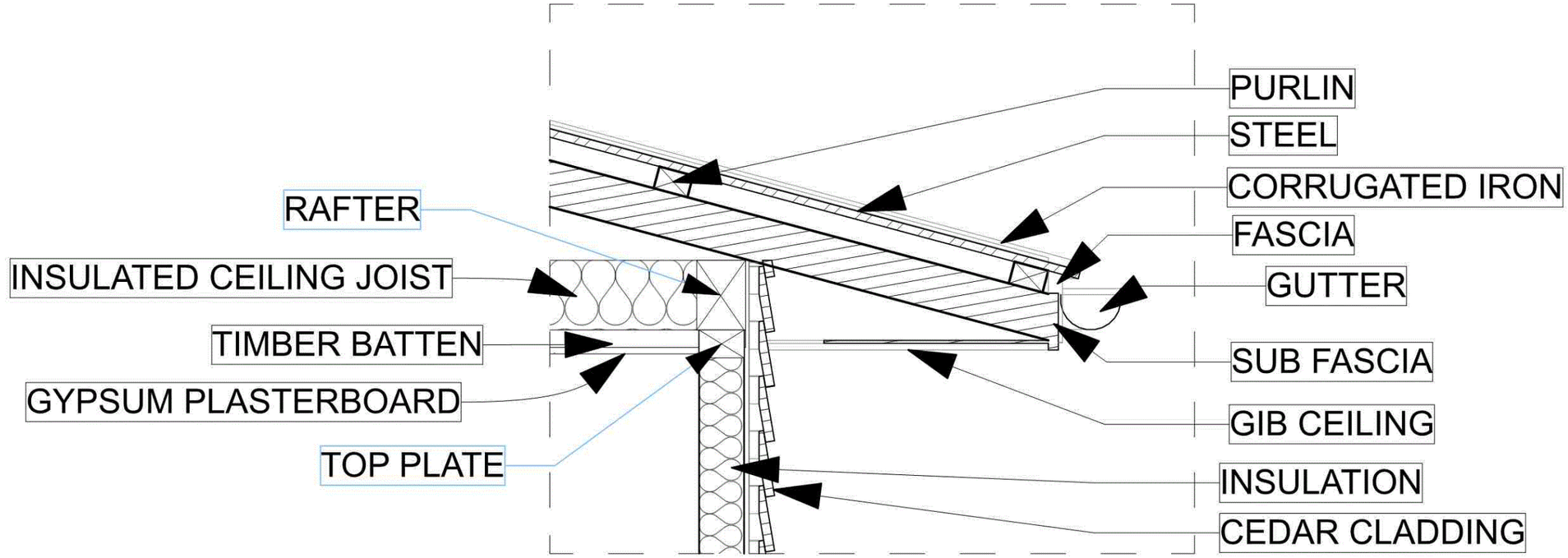
EMERGENCY HOUSING	16/09/2024	SCALE 1: 50 SECTION VIEW	DRAWING 5 OF 7

ARCHICAD EDUCATION VERSION

SECTION 1

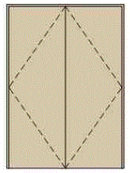


SECTION 2

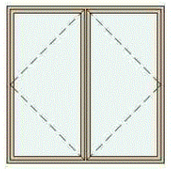
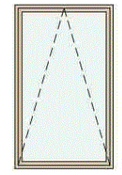
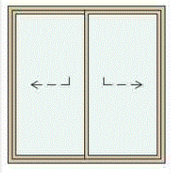
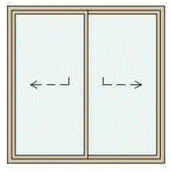
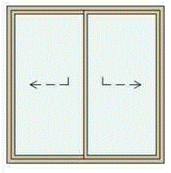


EMERGENCY HOUSING	16/09/2024	SCALE 1: 10	DRAWING 6 OF 7
	DETAIL DRAWINGS		

ARCHICAD EDUCATION VERSION

Door Schedule					
ID	D001	D001	D002	D002	D003
2D Symbol					
Elevation (Opening Side)					
Location					
Unit Size (WxH)	810×2,025	810×2,025	1,500×2,100	810×2,025	810×2,025
Rough Opening Size (WxH)	810×2,025	810×2,025	1,500×2,100	810×2,025	810×2,025
Leaf Size (WxH)	760×2,000	760×2,000	1,450×2,075	760×2,000	760×2,000
Orientation	L	R	L	L	L
Sill Height	0	0	0	0	0
Head Height	2,025	2,025	2,100	2,025	2,025
Quantity	1	1	1	1	1

1 Door Schedule 1:1

Window Schedule					
ID	W001		W002	W003	W004
2D Symbol					
Elevation (Opening Side)					
Location					
Unit Size (WxH)	1,500×1,500	900×1,500	1,500×1,500	1,500×1,500	1,500×1,500
Rough Opening Size (WxH)	1,500×1,500	900×1,500	1,500×1,500	1,500×1,500	1,500×1,500
Orientation					
Sill height	600	600	600	600	600
Head height	2,100	2,100	2,100	2,100	2,100
Quantity	3	1	1	1	1

2 Window Schedule 1:1

EMERGENCY HOUSING

16/09/2024

DOOR AND WINDOW SECHDULE

DRAWING 7 OF 7

Achievement – spatial design

Subject: Design and Visual Communication

Standard: 91338

Total score: 03

Grade score	Marker commentary
A3	This set of drawings is at an Achievement grade. The site plan clearly shows the building positioned on the site with a north point orientating the building. The plan view is drawn well, using the correct conventions and communicates the technical details in the form of room fittings, door swings, and windows. It also shows the north point orientated correctly. The elevations are drawn correctly, showing windows and doors and exterior materials. The labelling of the elevations is correctly linked to the floor plan view. However, the proportion of the dimensioning on the elevations is too big and is not showing the application of dimensioning conventions. The candidate has some understanding of how to use CAD and though the pages are linked through the title and page numbers, the sequence of pages is a little jumbled. It is important to reference and link all of the drawings to one another to enable them to be read as a coherent set of working drawings. To allow this set of drawings to achieve at a higher level, there is a need to communicate the technical details more clearly and effectively. The cross section drawn to a larger scale would have allowed it to communicate the visual information more effectively. Also, the linking between the section and the details are not accurate or clearly indicated for the features to avoid ambiguity.