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1.1

Design Considerations

~~Is it Fit for Purpose?~~

Will it do the job?

Who will use it?

What is it for?

Does it look good?

Is it safe?

Is it easy to use?

Is it cost effective?

Will it harm the Environment?

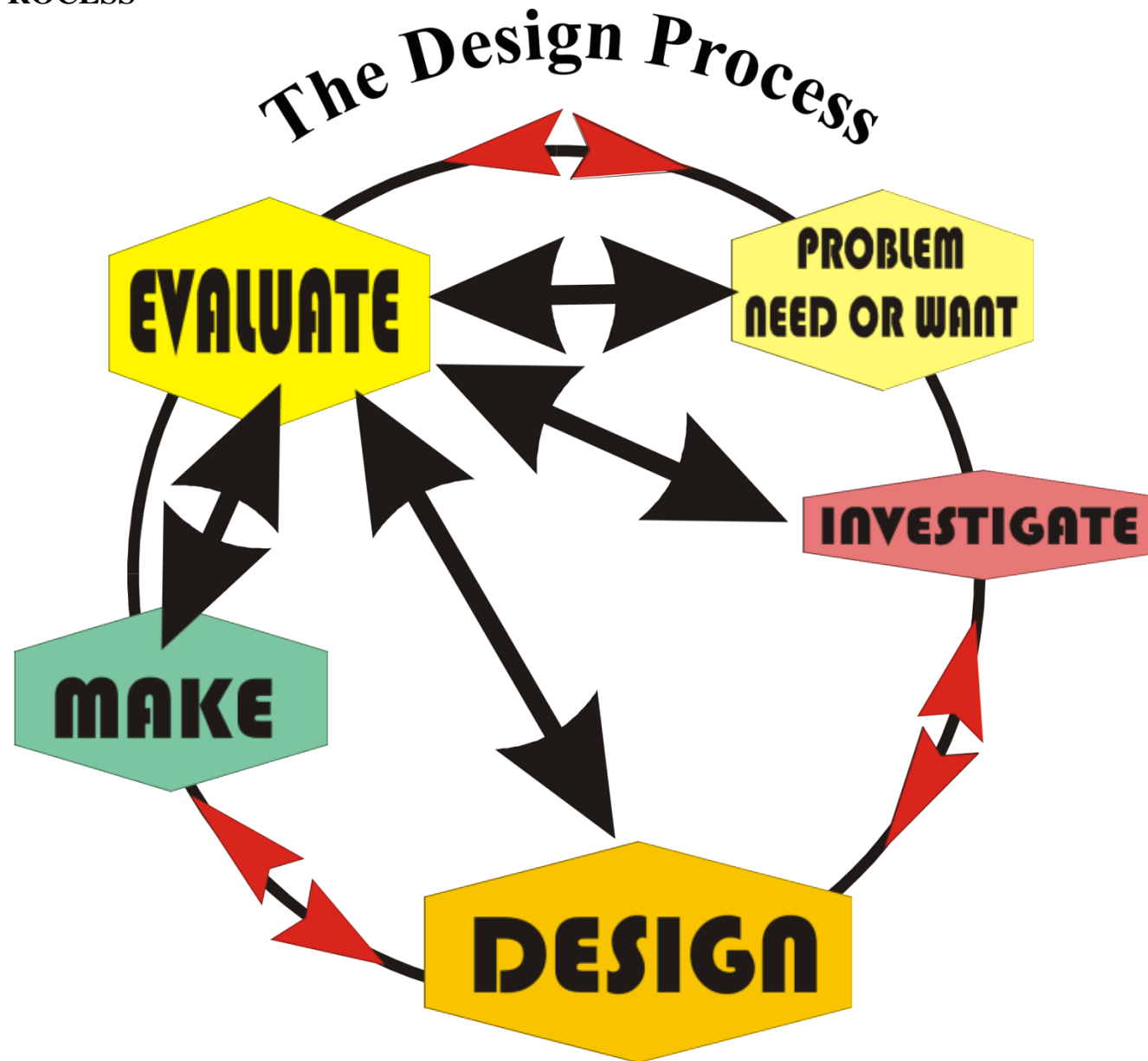


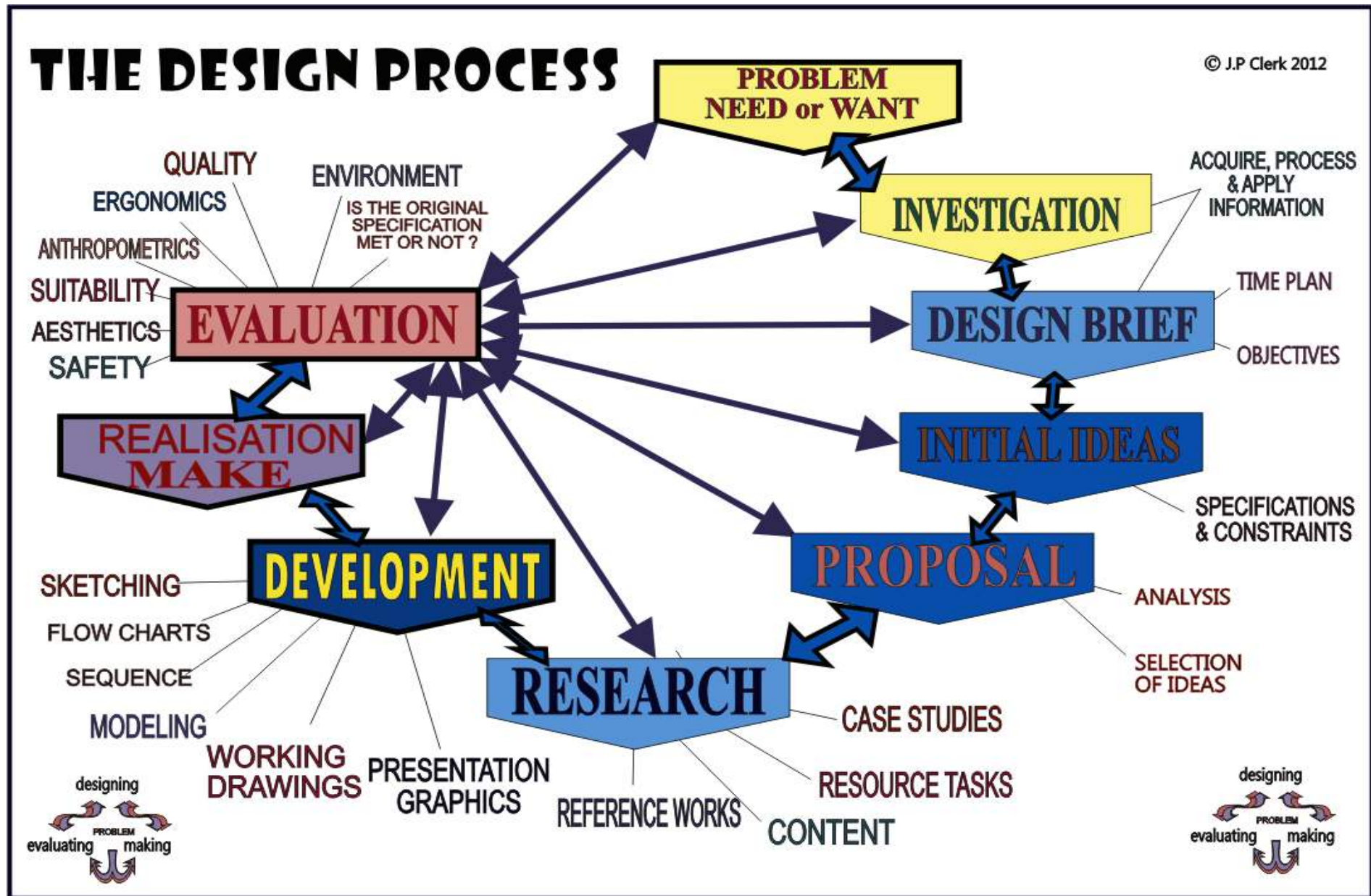
A design must fit the intended purpose i.o.w. It must solve the problem.

- It must utilise the properties of the chosen material optimally –avoid redundant structural members.
- It must be economical yet sufficient –avoid waste.
- It must be “easy” to manufacture.
- It must be safe to produce & safe to use.
- It must be ergonomically efficient – it must ‘fit’ the user.
- It must be environmentally friendly.
- It must be aesthetically pleasing (“look good”)



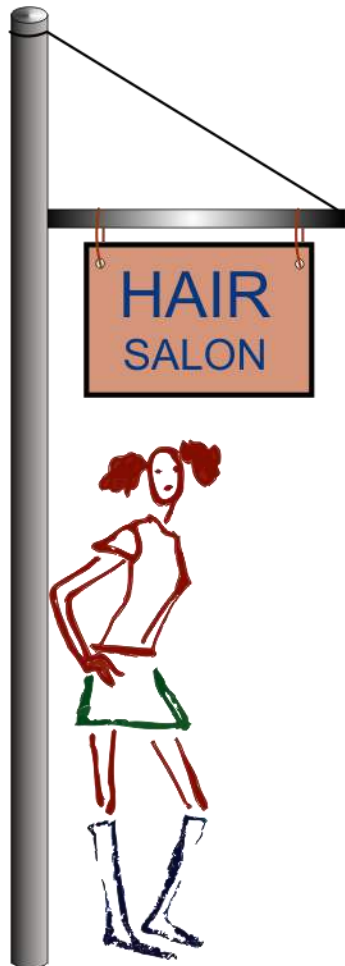
SIMPLE DESIGN PROCESS





DESIGN – *how should we hang the sign?*

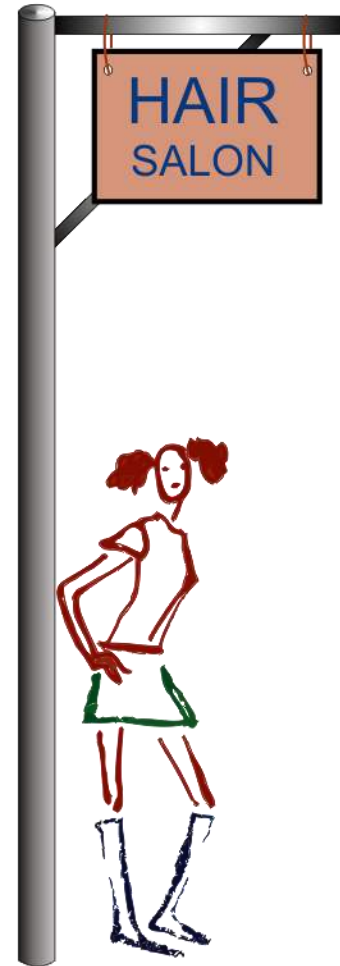
TIE



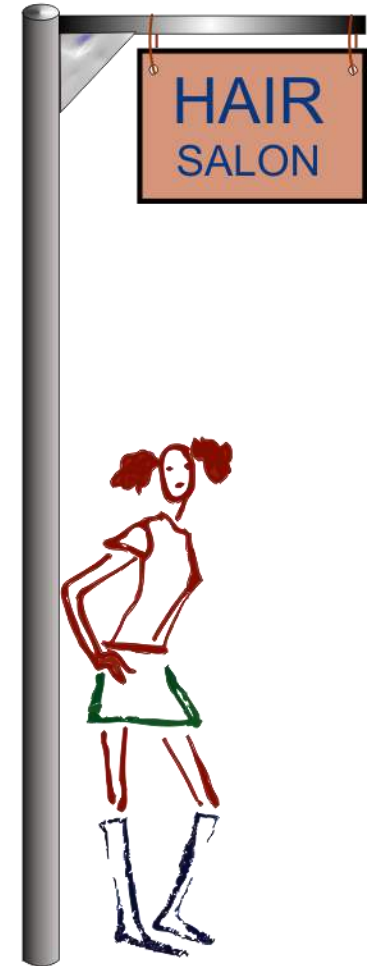
STRUT 1



STRUT 2



GUSSET

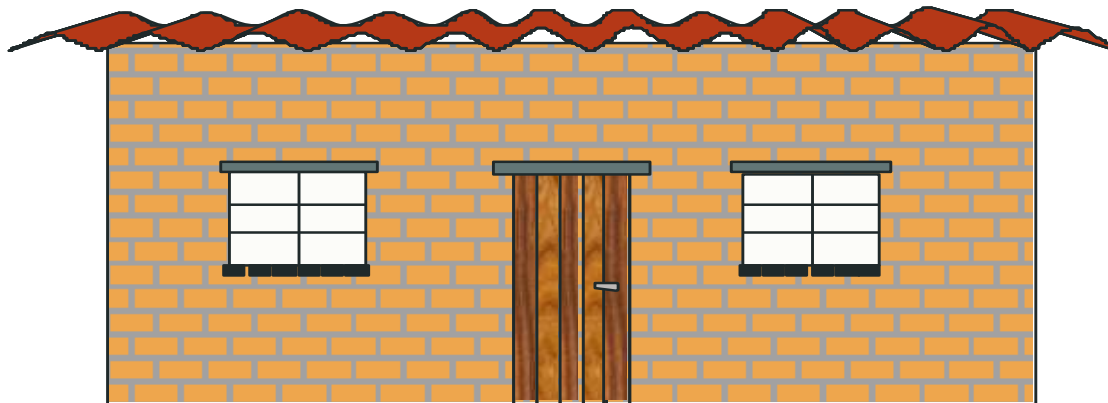


DESIGN:

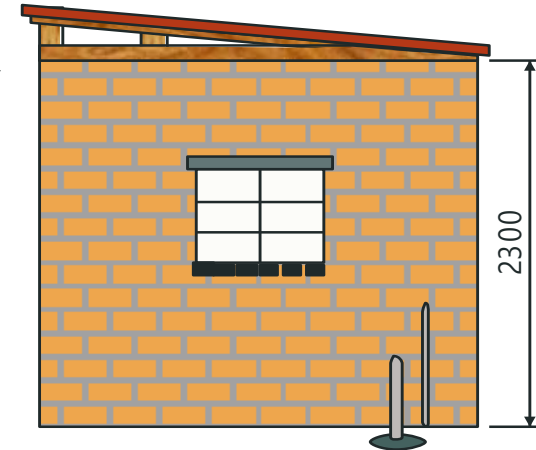
How many RDP Houses have the design features required by municipalities for residential homes?

RDP House

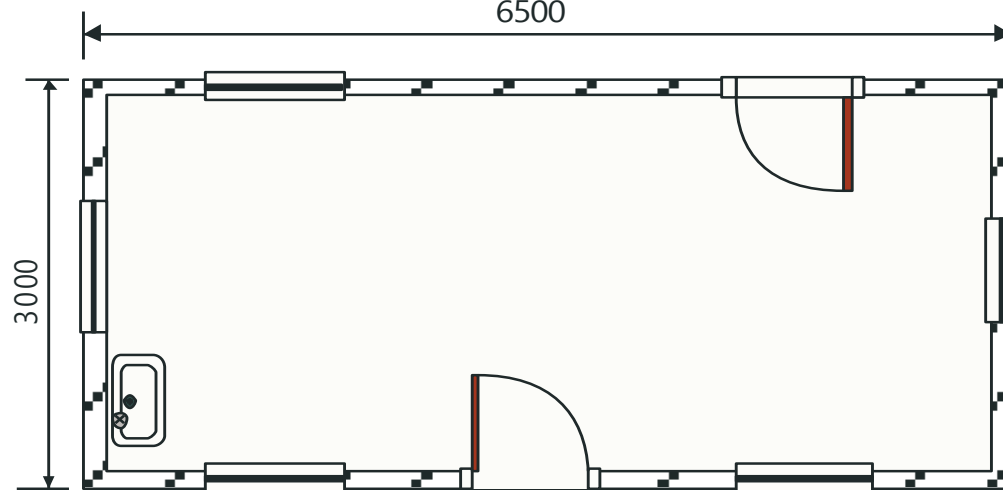
FRONT ELEVATION {South}



SIDE ELEVATION



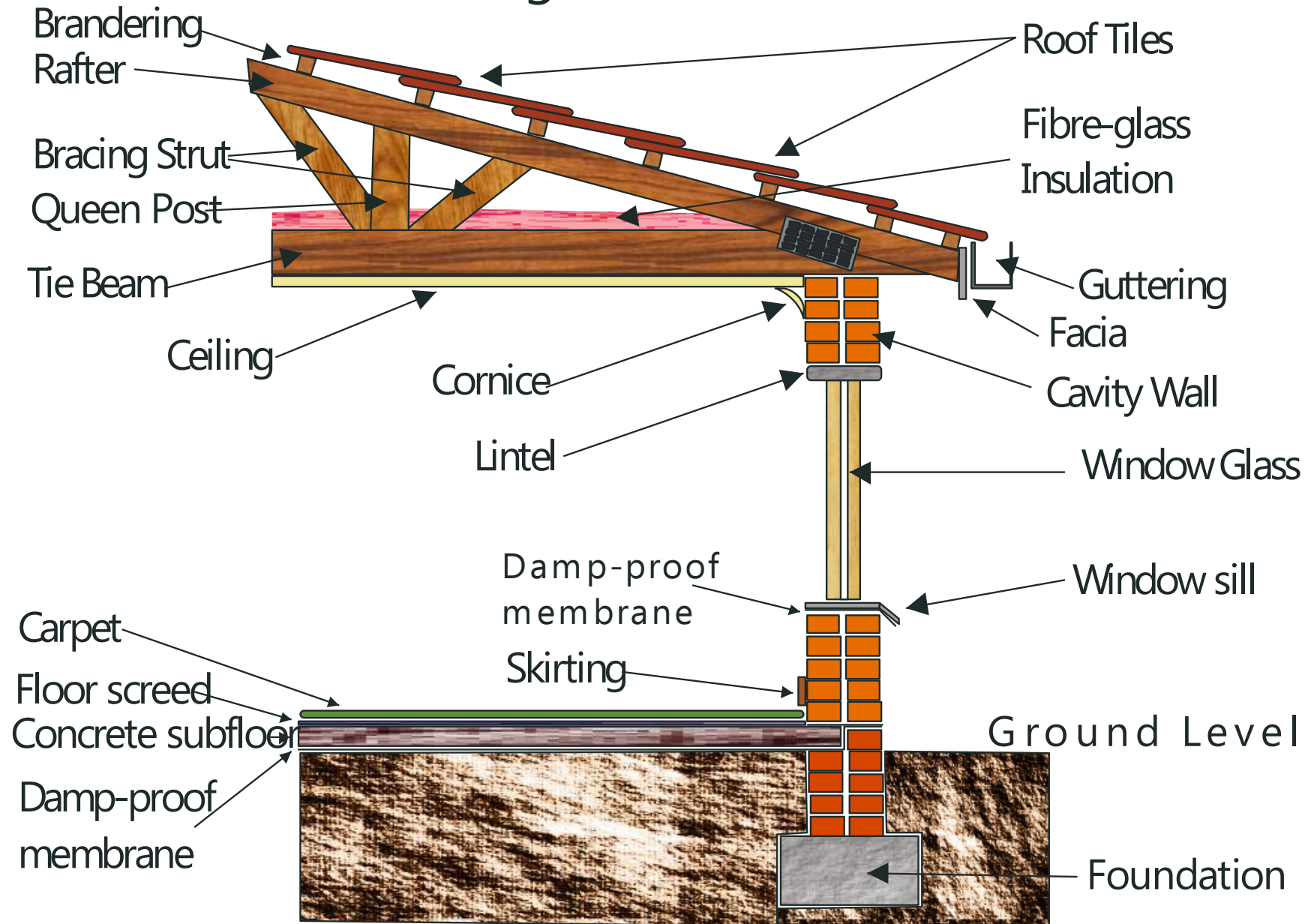
PLAN VIEW

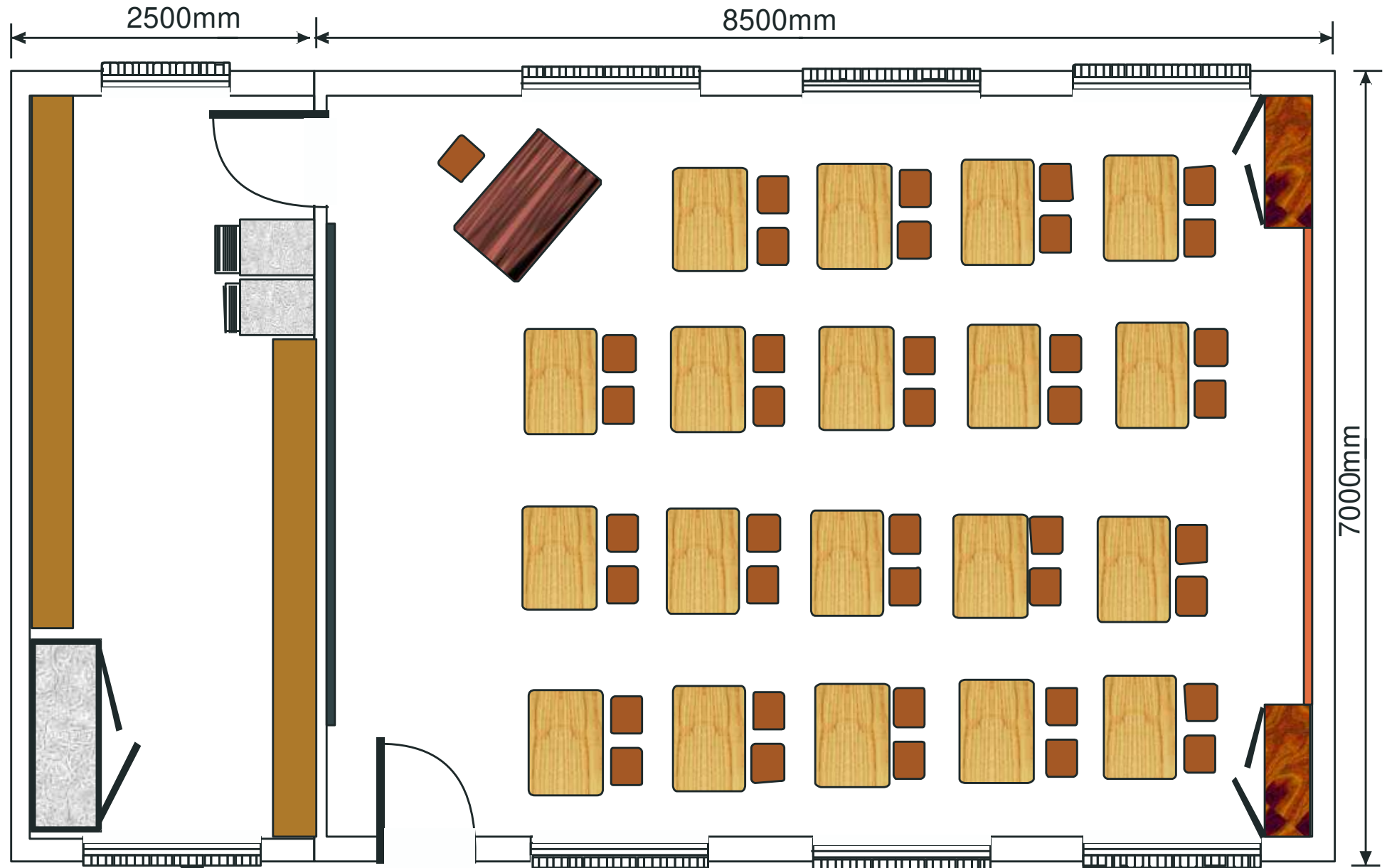


Architect: J. Dlamini
 Client: Dept of Housing
 Walls: Cement stock bricks - single width
 Floor: Concrete with cement screed
 Roof: Corrugated iron
 Ceiling: None
 Insulation: None
 Electricity: Pre-paid meter
 One light; two plug points
 Plumbing: Basin with cold water tap
 Toilet: Outside

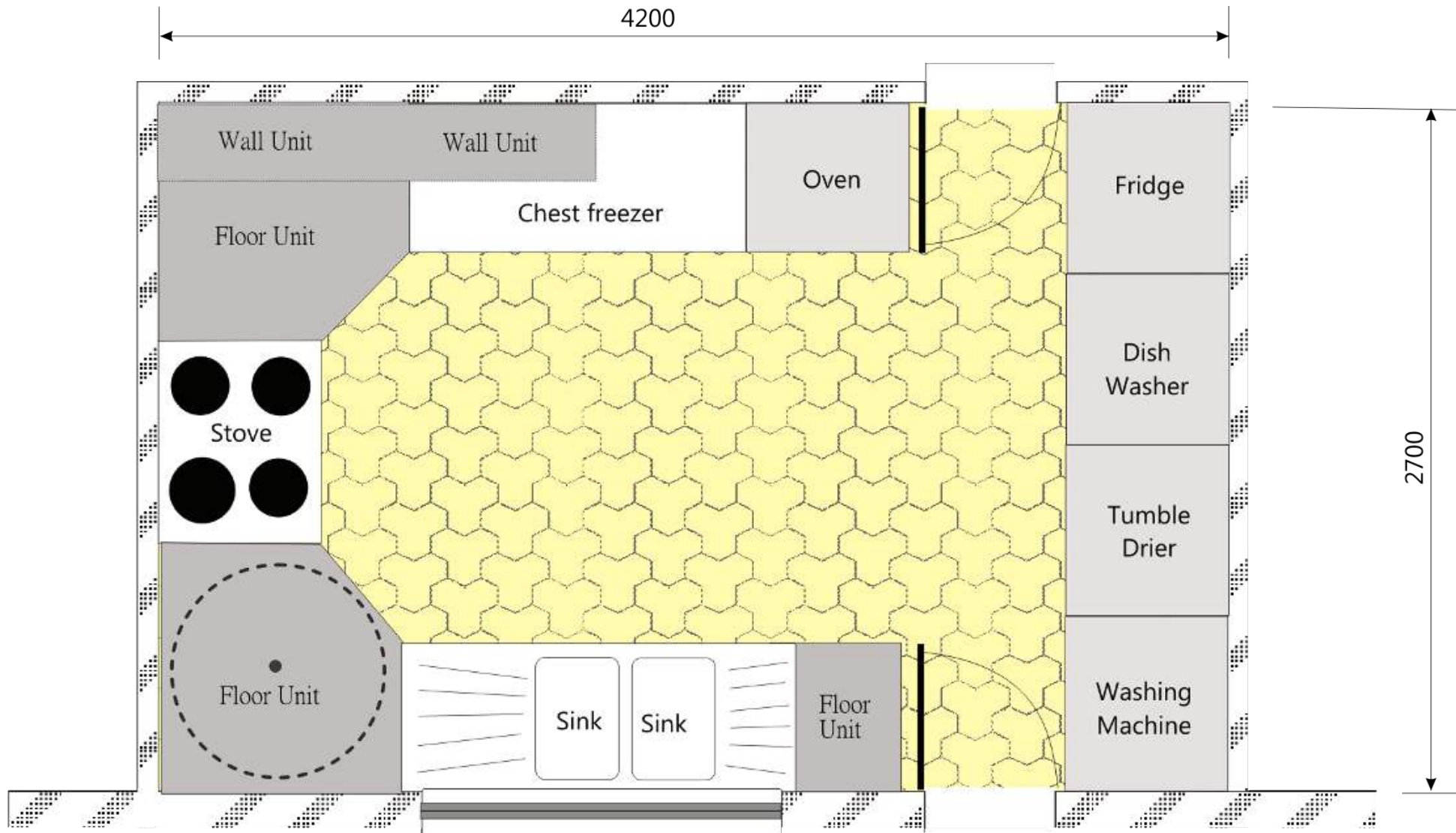
SCALE 1:50 (as drawn on A4)

Cross-Section through a House



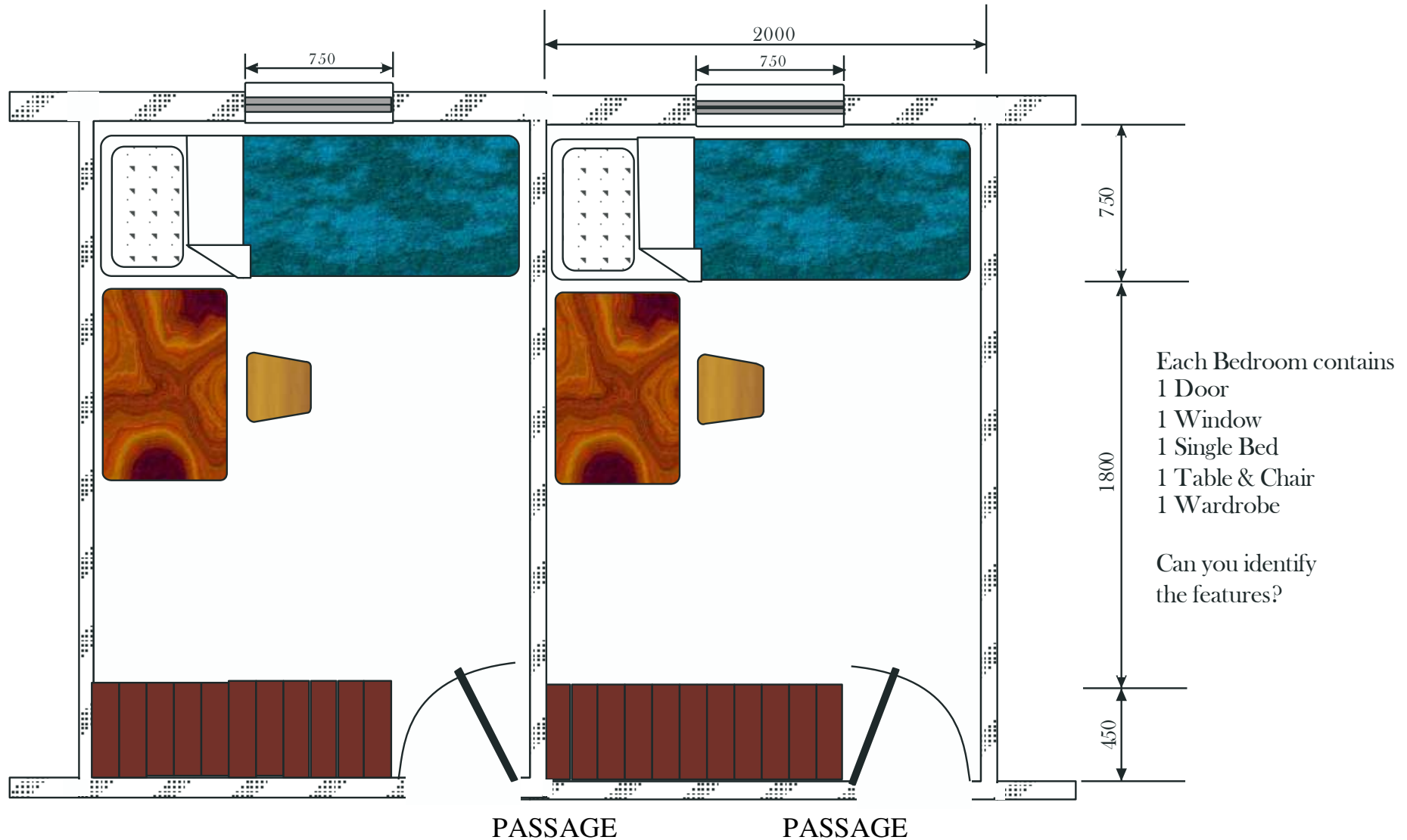


The “IDEAL” Kitchen??

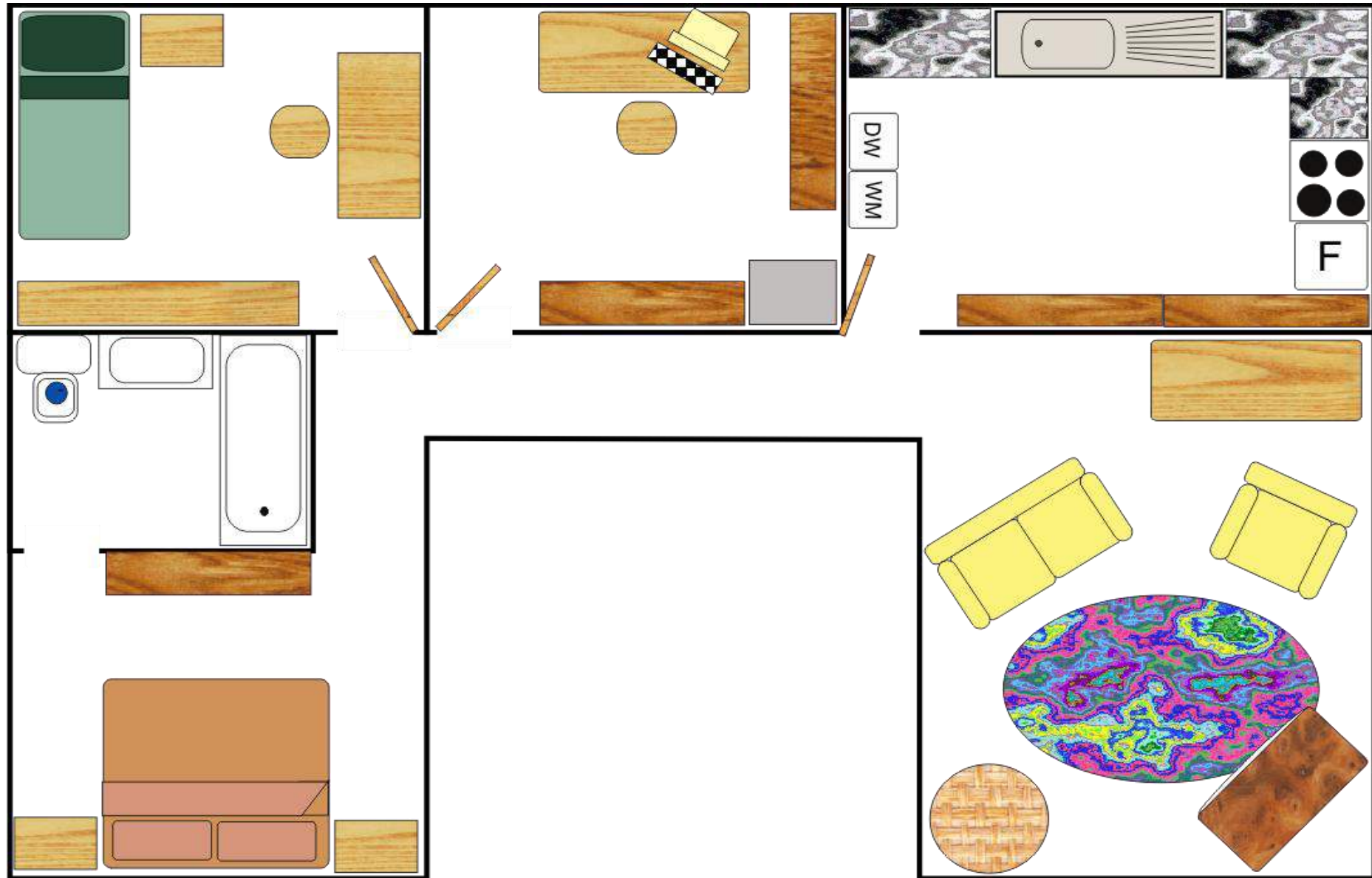


Two almost identical bedrooms for teenagers

Which one will the teenager prefer, and which one will the parents prefer for the child?



INTELLIGENT HOUSE DESIGN?

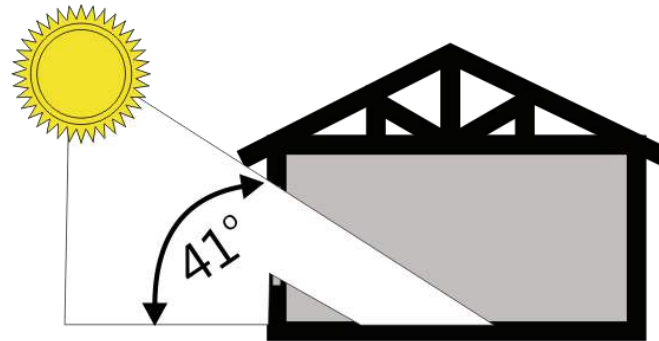


HOUSE FACES NORTH

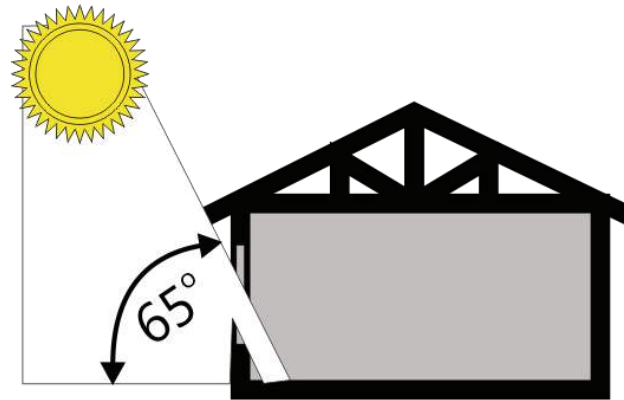
The overhang of the roof eaves is critical in terms of the latitude of the house position.

Many Townhouse complexes use the popular Tuscan villa design BUT this is done because the Tuscan house has no eaves, so the developer can cram more houses next to each other.

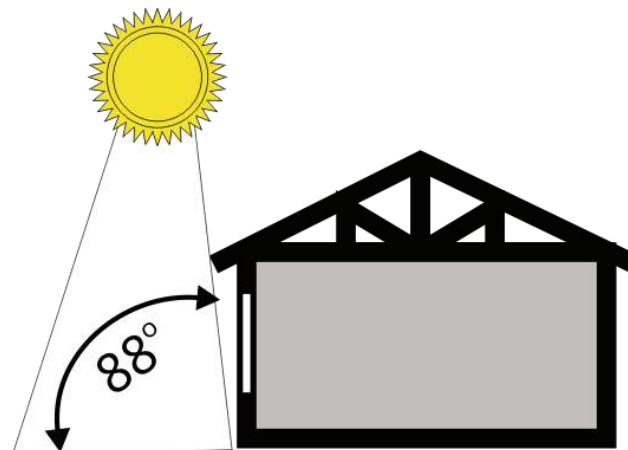
Unfortunately, in this country that is a big problem because we are much warmer than Tuscany and we need the protection of the roof eaves in the heat of mid-summer.



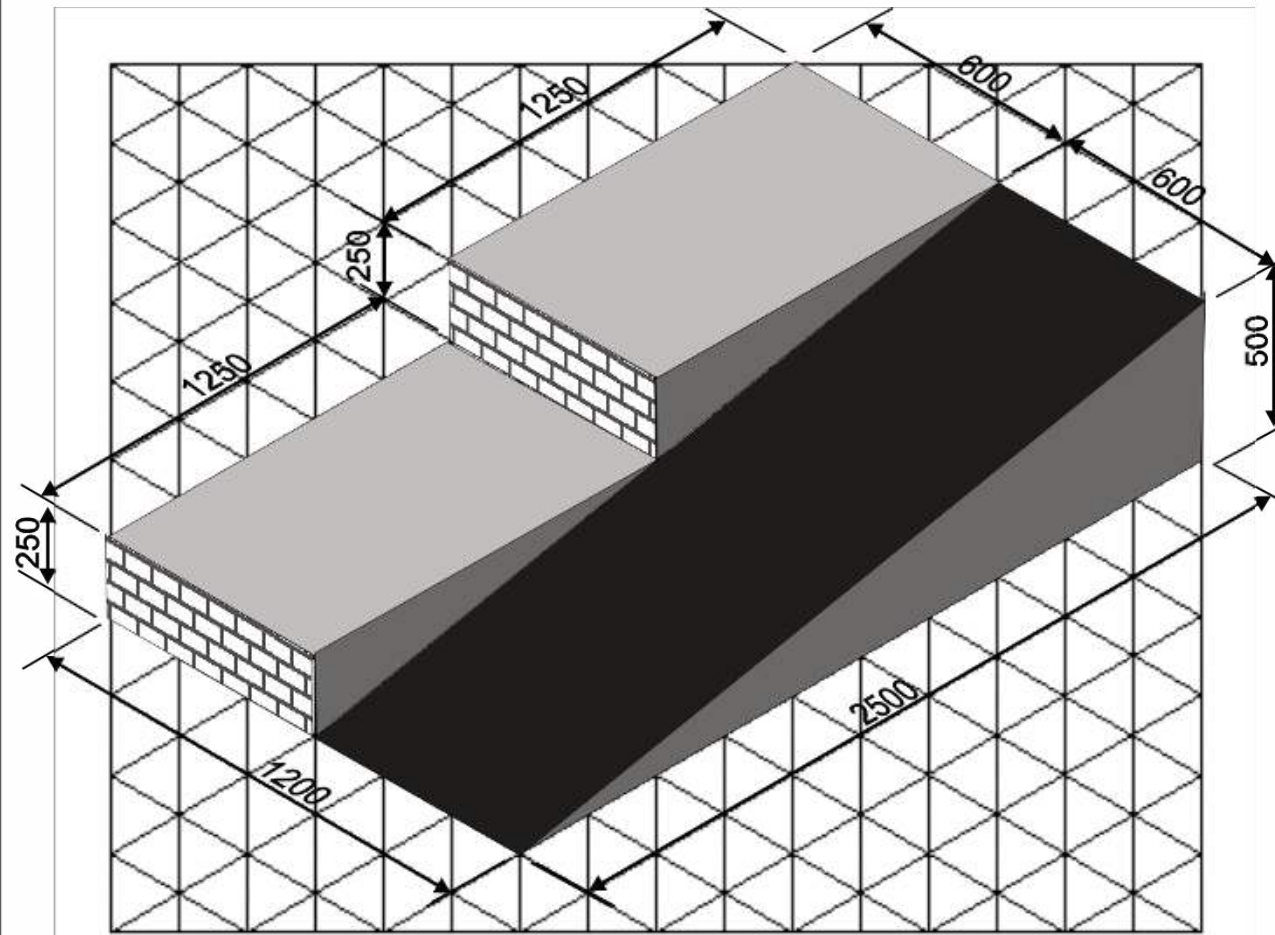
Penetration of the Sun's Rays into the house at midday in Winter



Penetration of the Sun's Rays into the house at midday in Spring and Autumn



Penetration of the Sun's Rays into the house at midday in Summer



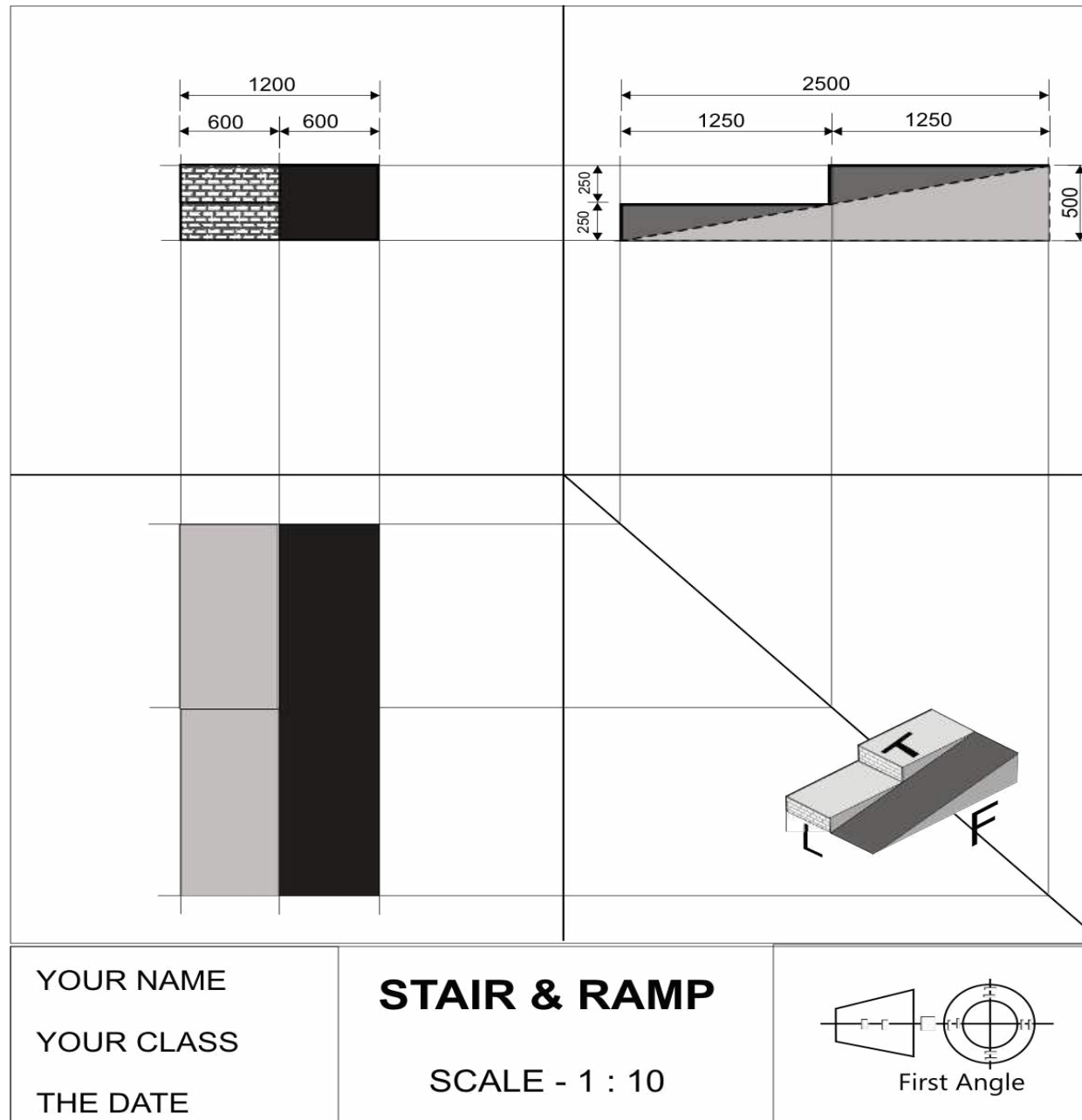
JOE JONES
Joe's Construction
2006.11.15

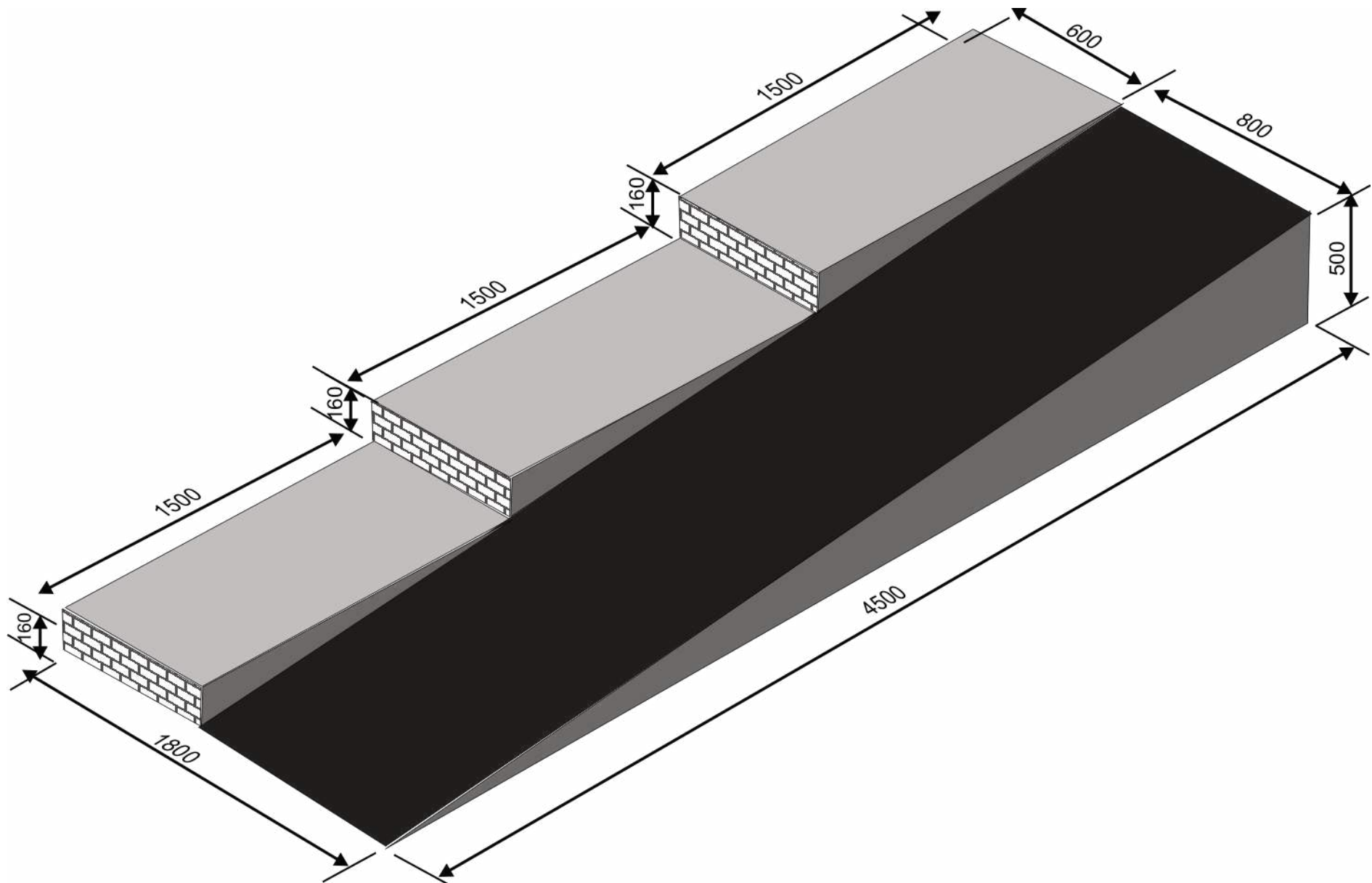
STAIR & RAMP

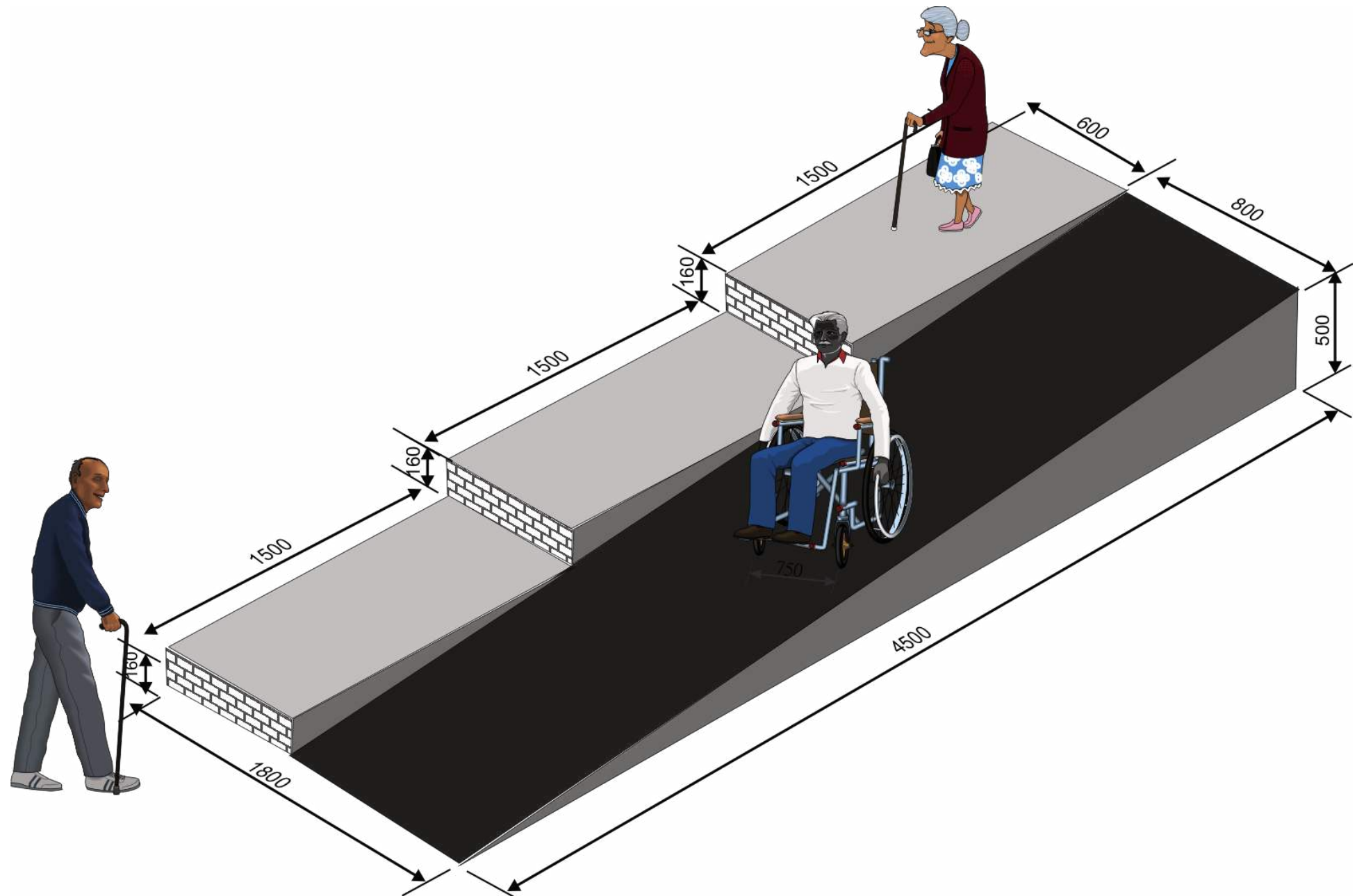
SCALE - 1 : 10

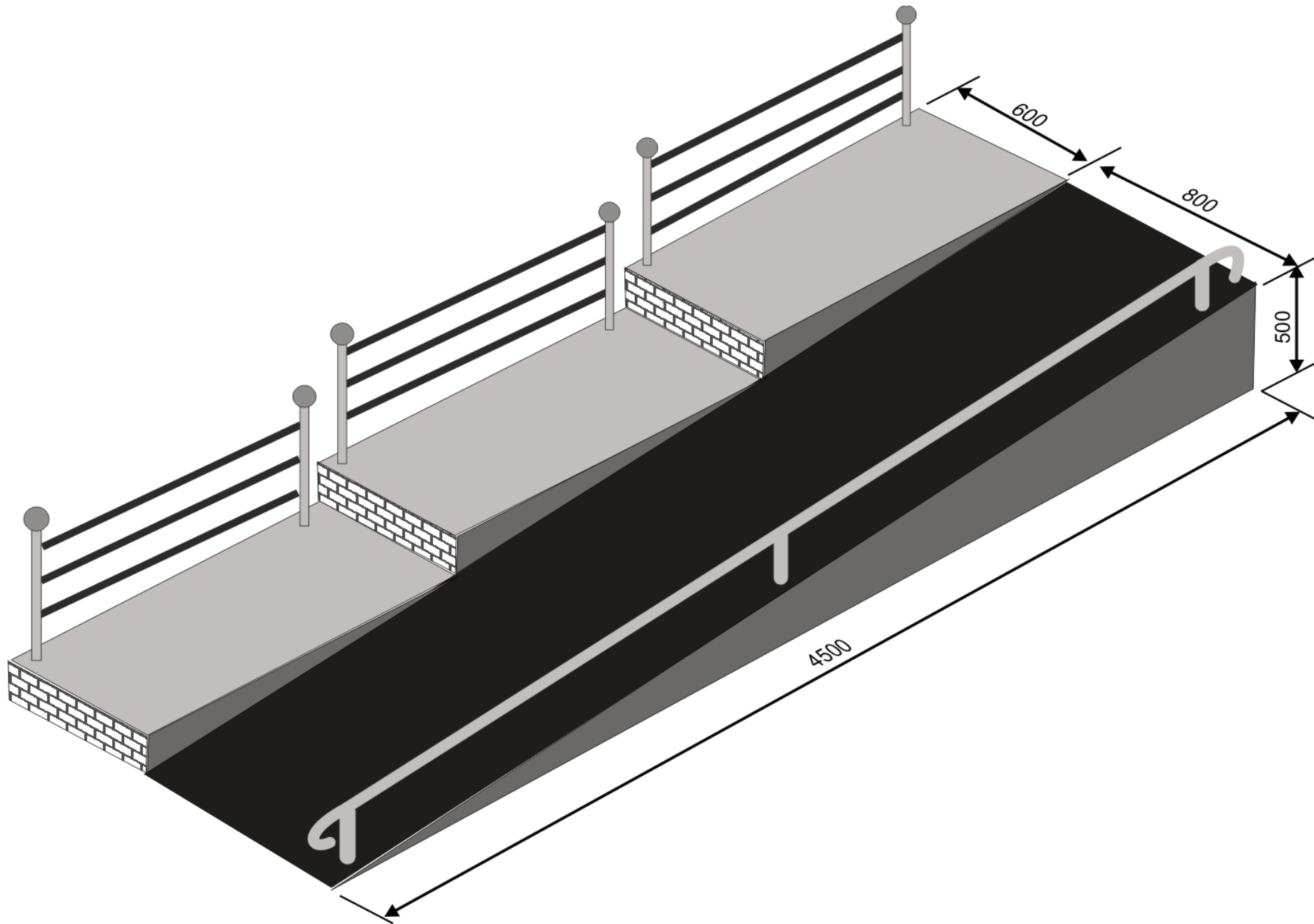
ISOMETRIC
 VIEW













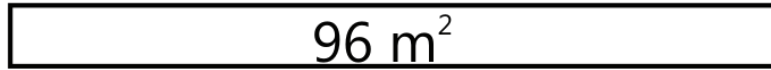
100 m of Chicken Fencing

49 m²



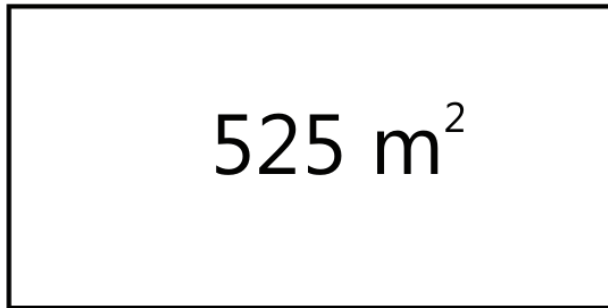
$$49 + 1 + 49 + 1 = 100\text{m}$$

96 m²



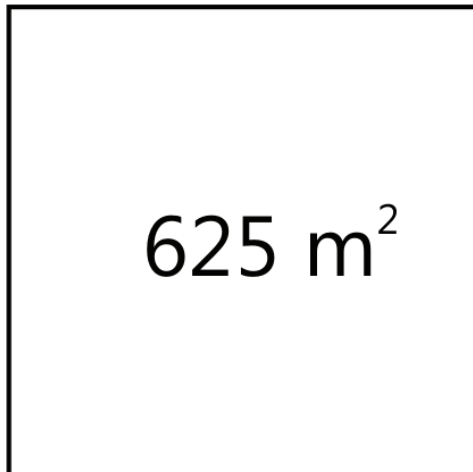
$$48 + 2 + 48 + 2 = 100\text{m}$$

525 m²



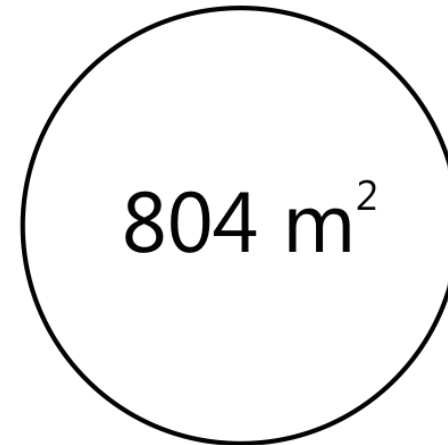
$$35 + 15 + 35 + 15 = 100\text{m}$$

625 m²

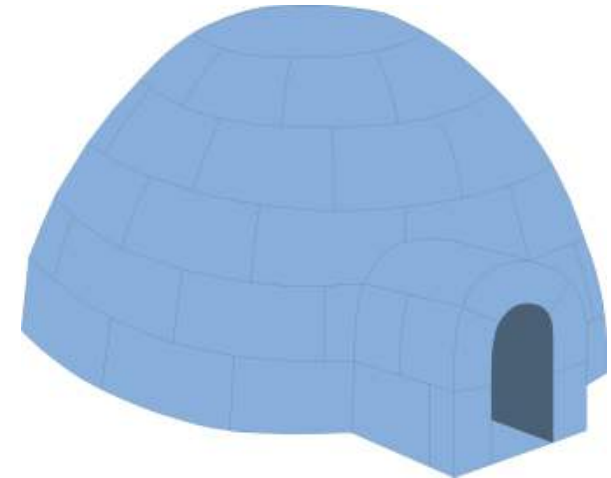
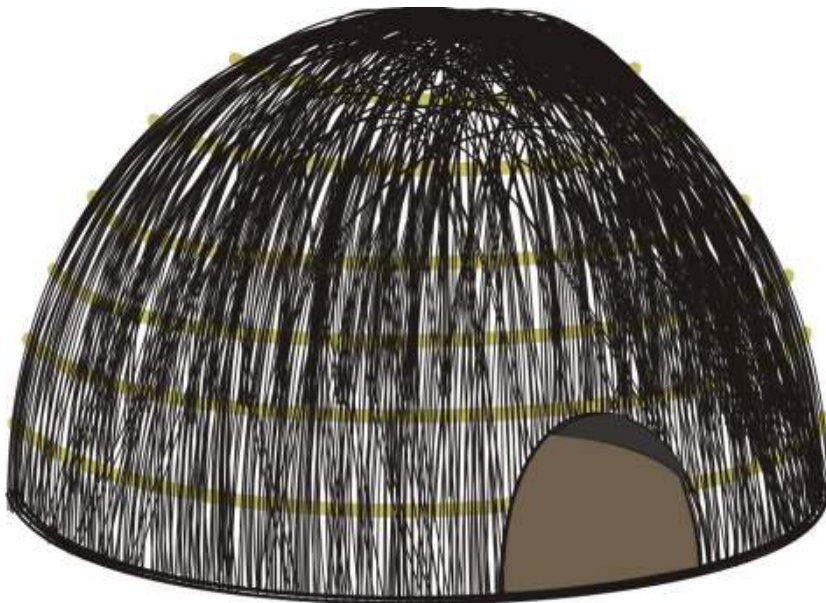


$$25 \times 4 = 100\text{m}$$

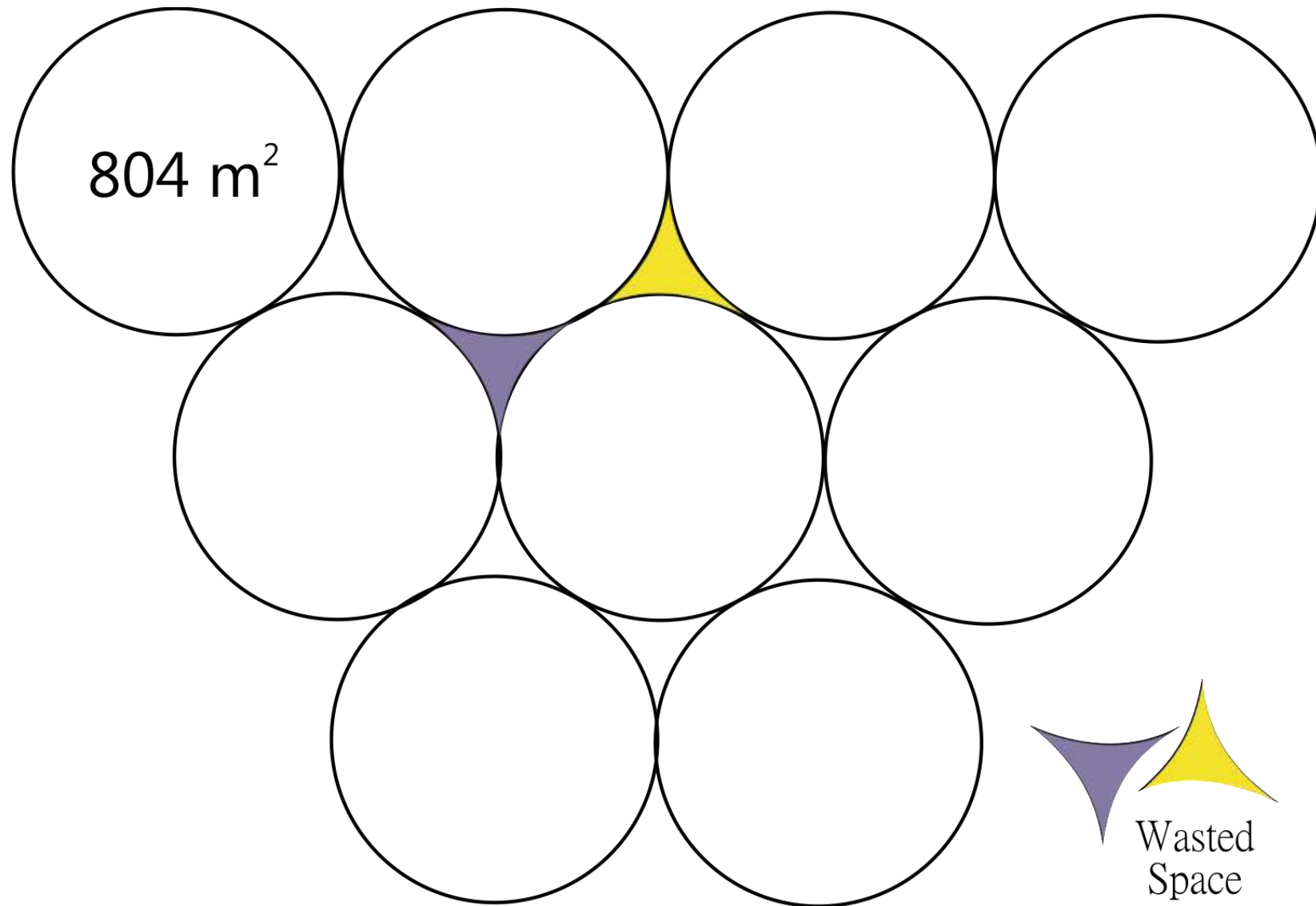
804 m²

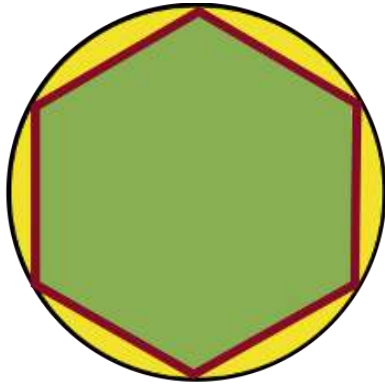


INDIGENOUS HOUSING: Matjieshuisie; Rondawel; Zulu Hut; Igloo

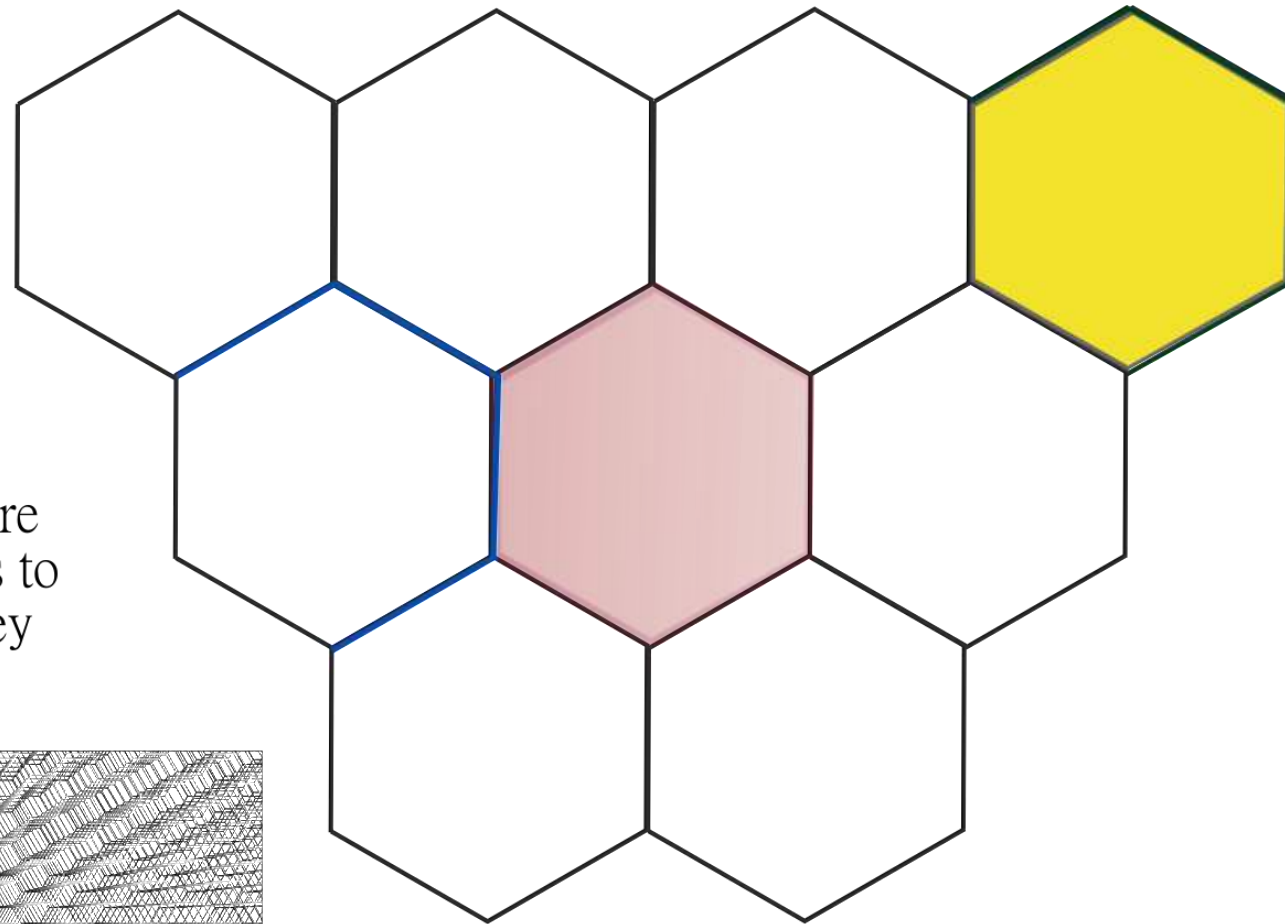


Circular shapes do not fit together efficiently

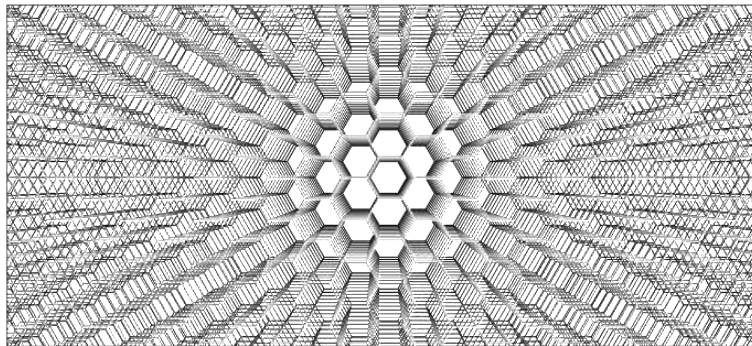




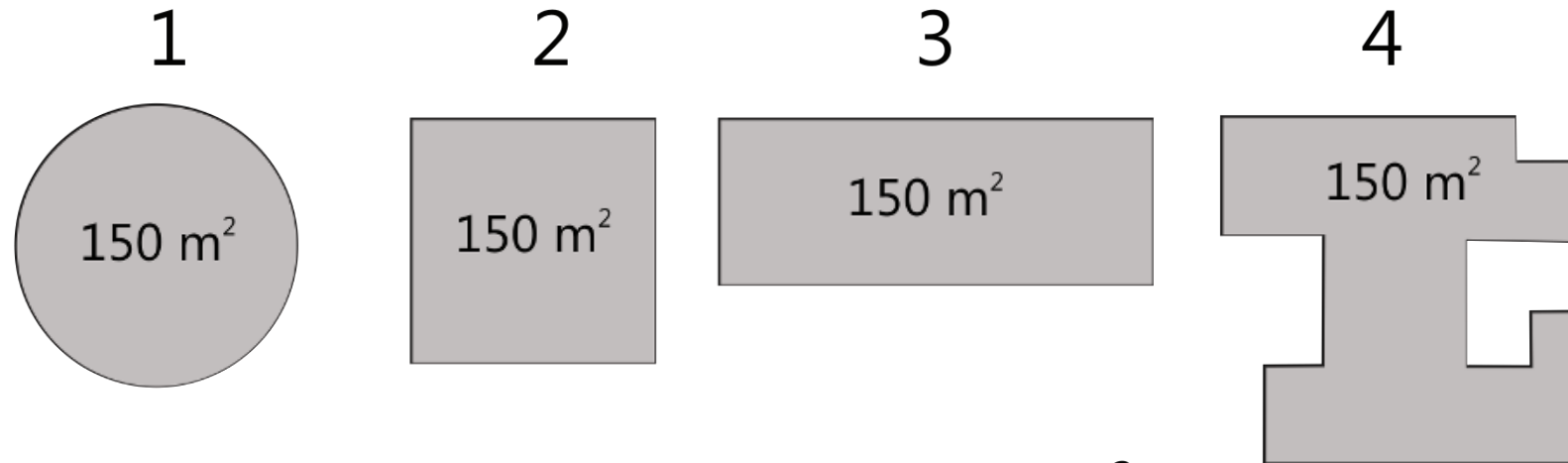
A HEXAGON is nearly as effective as a circle,
and has a great advantage when used with others



This is why hexagons are
used by bees and wasps to
save materials when they
make their nests



HOUSE SHAPES AFFECT BUILDING COSTS



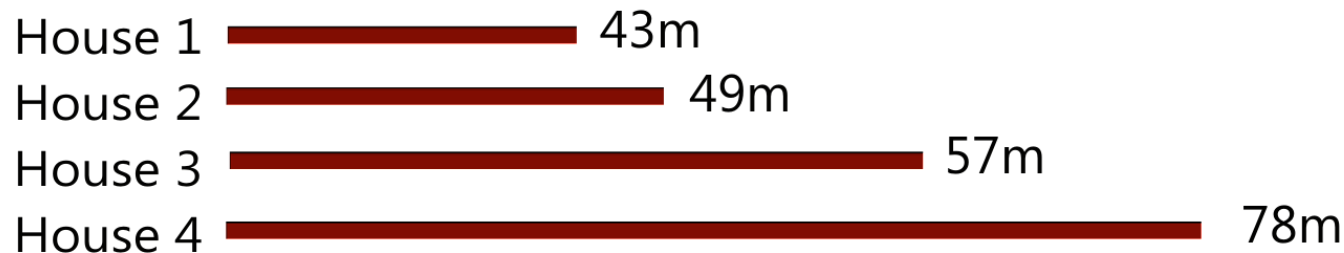
All houses have the **same area** - - - **150 m²**

House 1 has no corners

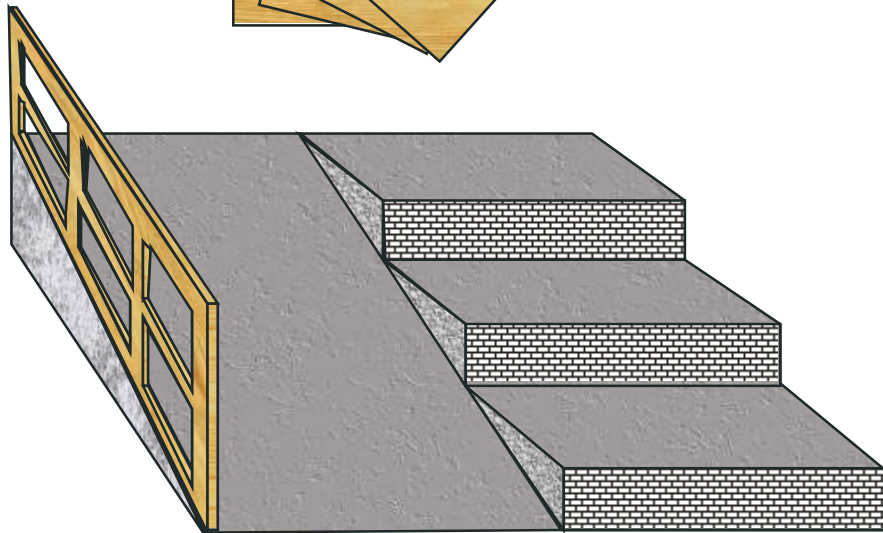
Houses 2 & 3 have 4 corners

House 4 has 16 corners

PERIMETERS



INTELLIGENT USE OF MATERIALS: FIT-FOR-PURPOSE / WASTE



A carpenter uses a 2880 x 1440 sheet of plywood to make a banister / handrail next to a ramp for a wheelchair.

Comment on the **suitability** of the chosen material in terms of...

- ⇒ Cost
- ⇒ Nature of material
- ⇒ Treatment needed to preserve material
- ⇒ Design idea
- ⇒ Waste

Suggest more suitable materials that could have been used to make the handrail.

Sketch a design in 2-DIMENSIONS for a handrail made of one of the materials you suggested above.

Use an ISOMETRIC PROJECTION to design any useful furniture item that can be made using the cut-out pieces so that they are not wasted.

DESIGN AN ITEM OF FURNITURE TO MAKE OPTIMAL USE OF THE “WASTE” WOOD

