TIMBER QUEENSLAND
We build Queensland

WHAT WORKS BEST:
LANDSCAPE & EXTERIOR ARCHITECTURE

Specifying the right timber product for the right job


Image: Kingfisher Bay Resort & Village Jetty

Ralph Bailey B.Arch (Hons) FRAIA

GUYMER BAILEY architects

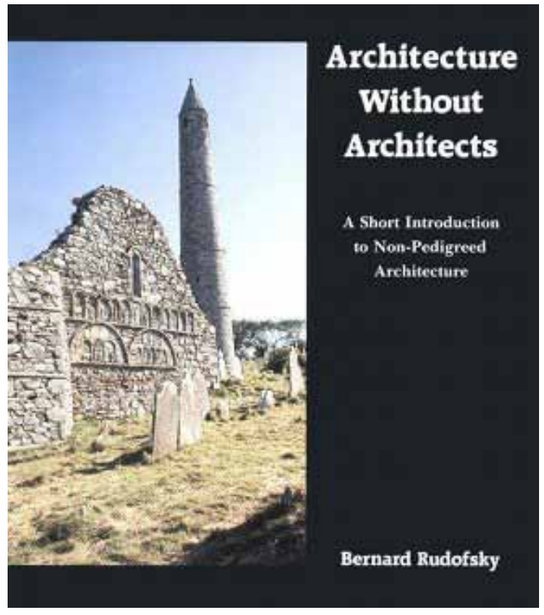
GUYMER BAILEY landscape

Timber has been used in landscape & exterior architecture for 1000's of years.

- The earliest would be the aboriginal gunyah – Large sheets of bark stripped from a tree & lent against timber poles & horizontals or other trees to make shelters

- Asian (China, Japan in particular) & Scandinavian countries made significant use of timber from the earliest times

- A book "Architecture without Architects" chronicles some of these structures



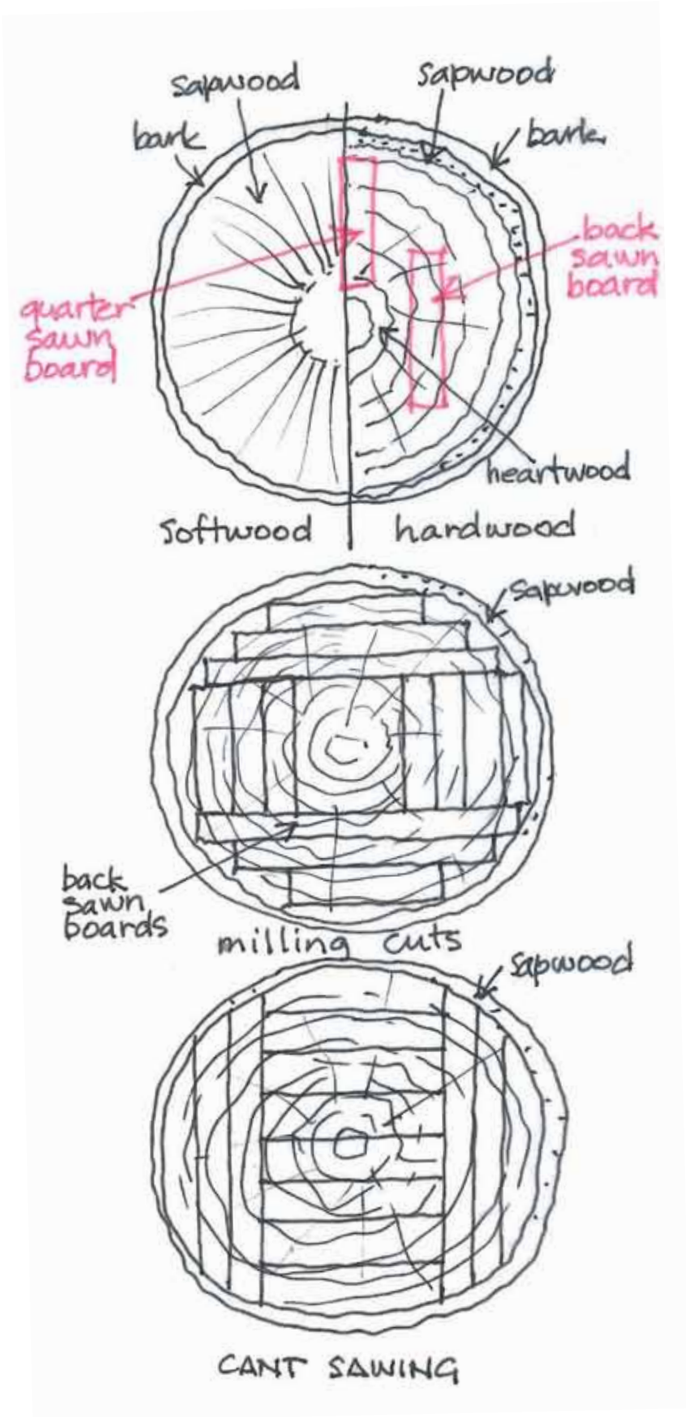
Lessons learnt:

- Durability of trees
- Selection of the right timber species for the job
- How to mill the logs
- How to dry it
  - Detail it
  - Fix it
  - Preserve / finish it
  - Maintain it

2 ways to learn:

1. By experience – trial & error yourself
2. By observation & learning from the others successes & failures (Repeating the same mistakes is not an option)

The era of the true craftsman seems to be disappearing – those who truly understood timber & how to work with it



We still see timber being used externally in ways where failure is assured (& sadly almost accepted & excused)

It is distressing to see timber:

- Incorrectly specified in regards to:
  - Species selection
  - Grading
  - Drying
  - Use & detailing
  - Finishing / presentation
  - Maintenance
- Structures failing:
  - Verandahs & decks collapsing
  - Boardwalks needing replacement in a few years

Water is the enemy of timber in:

- Cracks
- End grains
- Joints
- Fixing holes

- Timber must be able to dry out
- Learn from others failures & successes

Look & Learn

Don’t try to reinvent the wheel every time you design or build

Underside of a verandah that is failing.

Timber stairs rotting.

Rotted timber pool surround (200x75 CCA treated HWD double nailed & split down the middle)

If you don't know – Ask / Seek advice

Eg - Timber Queensland

- Ted Stubbersfield - Outdoor Structures Australia

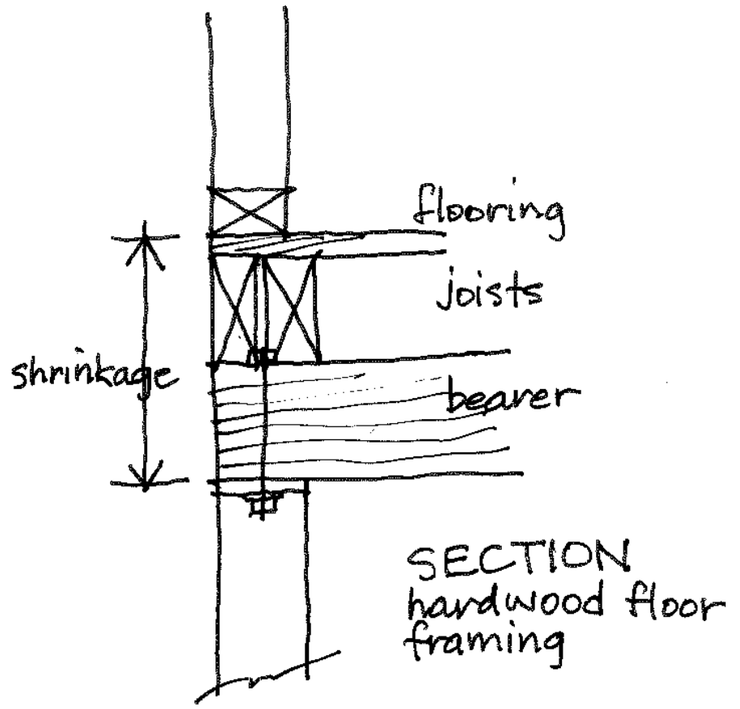
Don't waste timber, it is a precious resource

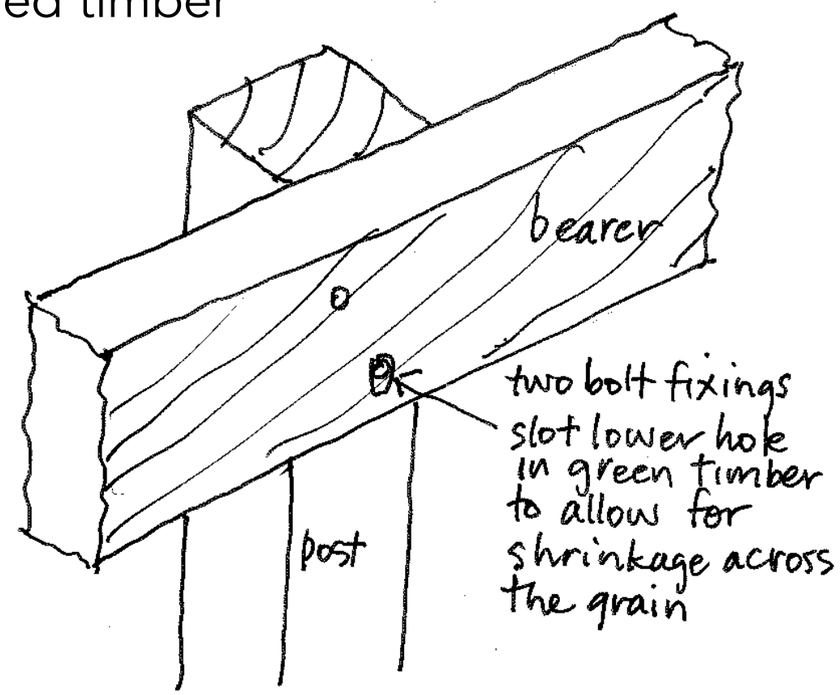
Understand:

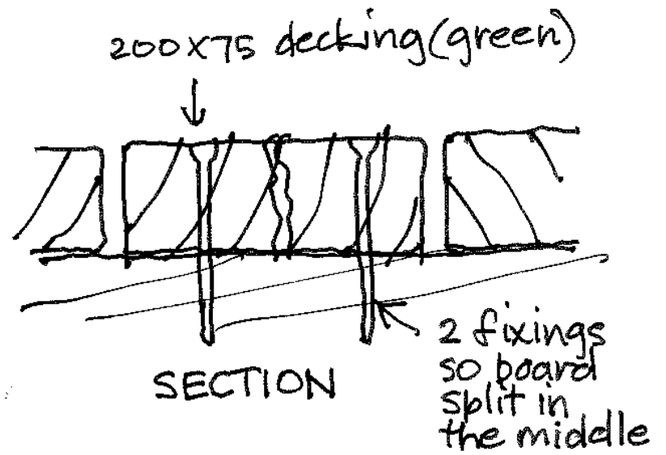
Use of green hardwood & shrinkage - Design for it

Vs

Air or Kiln dried timber



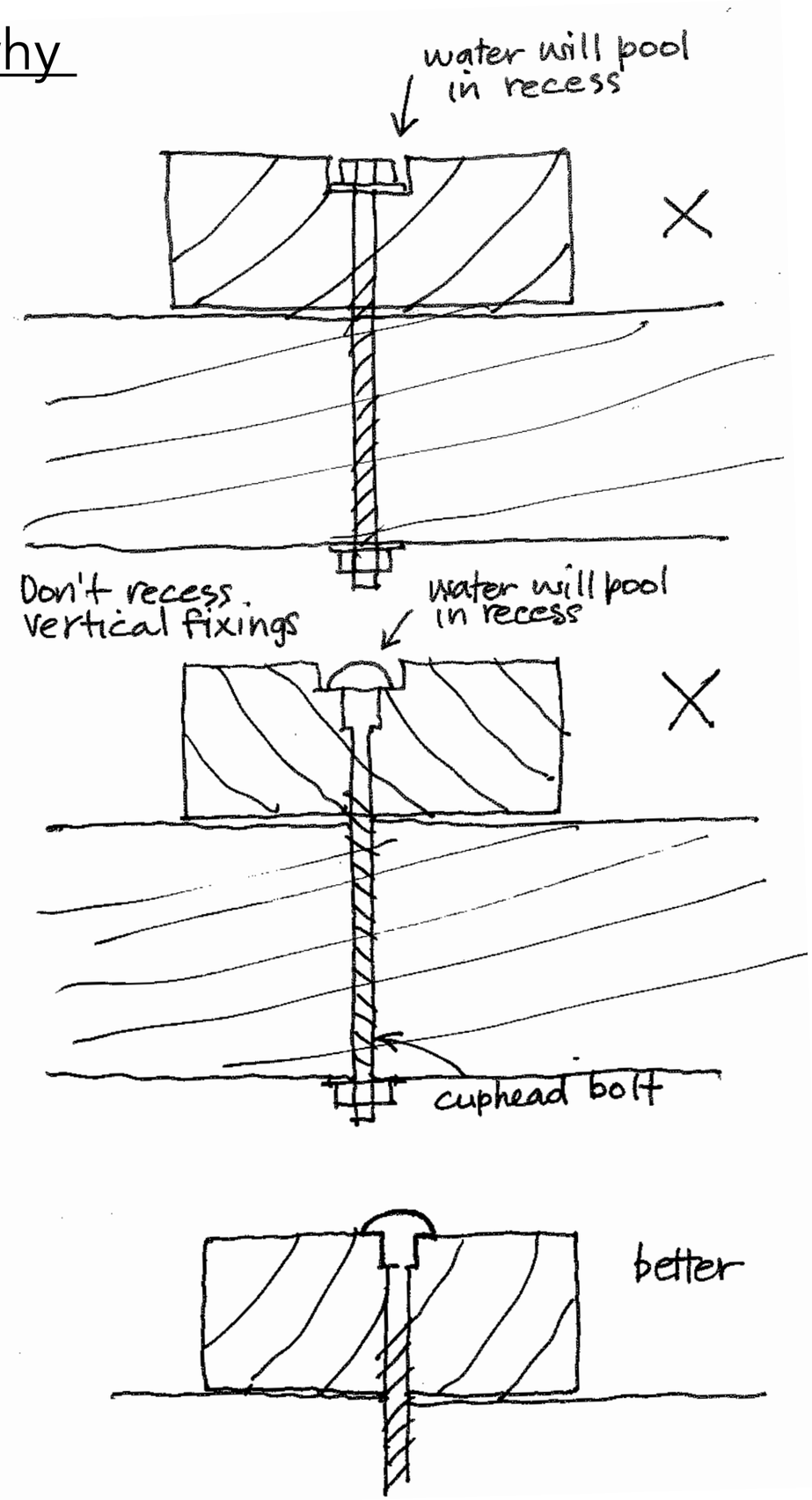




I have a favourite saying – <u>How will it fail & why did it fail?</u> I always want to know!

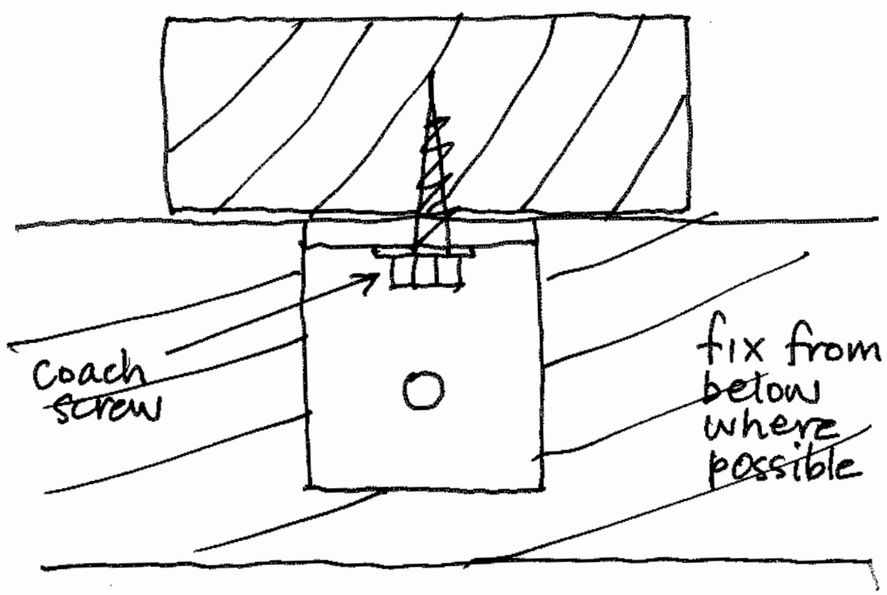
Example: Vertical bolting & screwing

- Not so good
- At least put CN emulsion in drill hole first

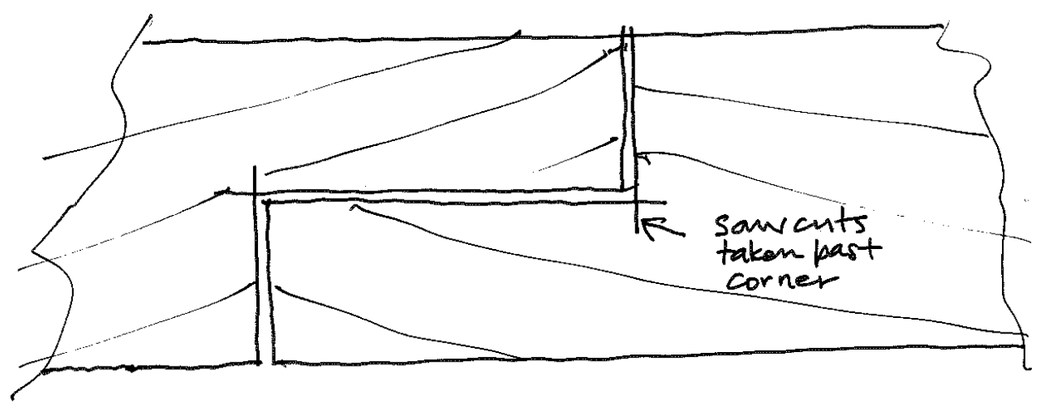


- Horizontal bolting & screwing is best where possible

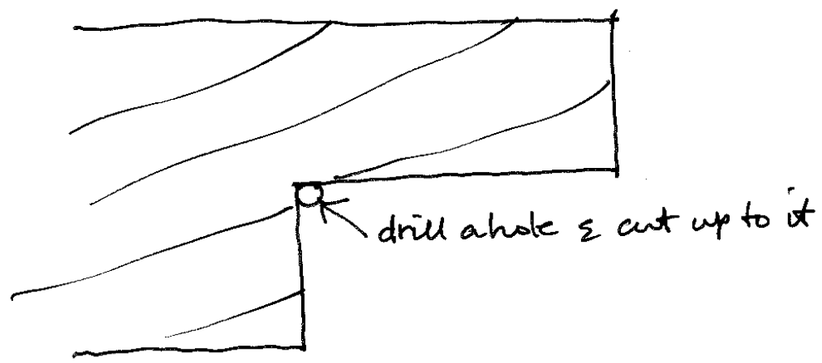
- One fixing or two
  Decide – If green or large section timber
  & consider structural function



Cutting structural members particularly in external timber



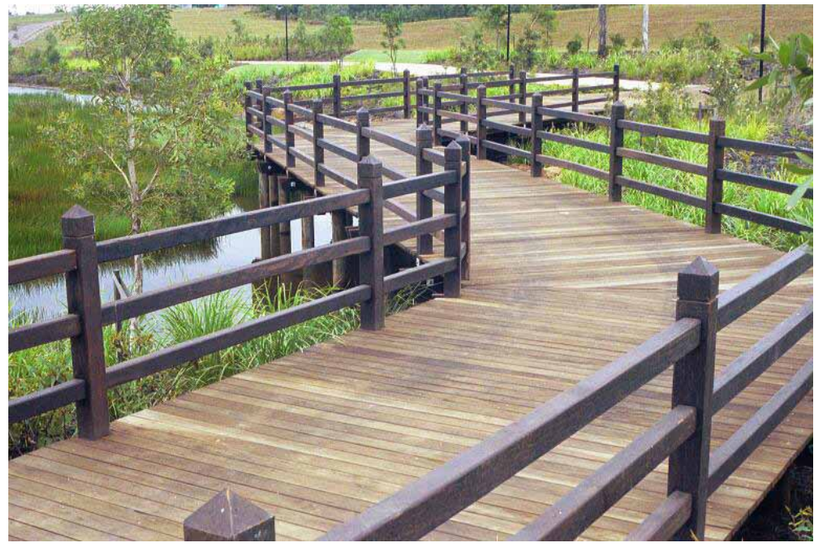
Sawcuts should never cut past the corner — seems obvious — greatly weakens bearers, joists etc



Timber in landscaping and external architecture includes:

- Fences & gates
- Bollards
- Log or sleeper retaining walls
- Handrails
- Boardwalks
- Verandahs & decks & steps
- Jettys & wharfs
- Bridges
- Piles
- Telephone poles & cross spars
- Park shelters
- Pergolas & gazebos
- Park & street furniture
- Playgrounds

We must remember it is not always about the initial cost to do it properly. A failure will cost far more if demolition and replacement are factored into the project – Plus downtime / loss of income



Where do we start?

1. Understand the purpose for the timber

- A bridge, a pergola, a boardwalk?
- Is it decking, joists, bearers, posts?
- Will it be in contact with the ground?
- Will it be exposed to the weather fully or partially?

2. Make the appropriate selection - of species of timber, classification, durability rating, strength category, defects, how / where cut from the log

3. Will the timber be green, air dried or kiln dried? Treated or untreated?

4. Will the timber be dressed or round sawn?

Slip category may be incorporated for decking etc. R11 or R12 as a minimum

5. How will it be detailed and constructed?

6. What fixings will be used?

7. Will it be left natural to weather or have an oil or paint finish?

8. Will it be inspected & maintained?

Regularly / Infrequently / Never?

For external timber use, how do we make the appropriate selection of species?

Note: F ratings for strength characteristics under AS2082 do not relate to durability ratings

(F17 joists failed in 3.5 years)
Victorian Ash – Low durability irrespective or strength

Better to specify “Royal species” because of their greater durability & strength but this list varies from state to state

i.e. Durability Class 1
Strength rating maybe F17, F22 or F24
- But what durability class?

Some species do well out of ground but not in it - Need to know

TIMBER SPECIES TABLE

	SPECIES	OUT OF GROUND CLASS	IN GROUND CLASS
ROYAL SPECIES	Ironbark	1	1
	Grey Ironbark	1	1
	Tallowwood	1	1
	Satinay	1	1
	Turpentine	1	1
	Spotted Gum	1	2
	Blackbutt	1	2
	Cypress (if sapwood removed & is also termite resistant)	1	1
	Brushbox	2 (bad for external decking)	3

Remember:
Strength grade is <u>not</u> durability grade

Note: Cypress was used for house stumps on KFBRV Cooloola villas

Recycled hardwood

Reclaimed hardwood from bridges, jettys, wharfs, old warehouses & industrial buildings is good product (even old railway sleepers & telegraph poles)

- Get more life out of timber - a second life
- Hardwood over time becomes harder & stronger but it is harder to drill & cut

  (Kennedys is a supplier)

KFBRV Jetty - bridge head detail

KFBRV Jetty - built 1989

KFBRV Jetty - Satinay piles
-The vehicle track boards are starting to fail
- Natural weathering / no treatment

The decision on whether to use green / air dried / kiln dried timber

- Affects detailing because of shrinkage - Design for shrinkage
- Treated (CAA / LOSP etc.) or Painted (with Cuprinol Creosote etc.)
- In hardwood only the sapwood is effectively impregnated especially evident in Spotted Gum & Blackbutt – Regulated by laws

Will it be used dressed or rough sawn?

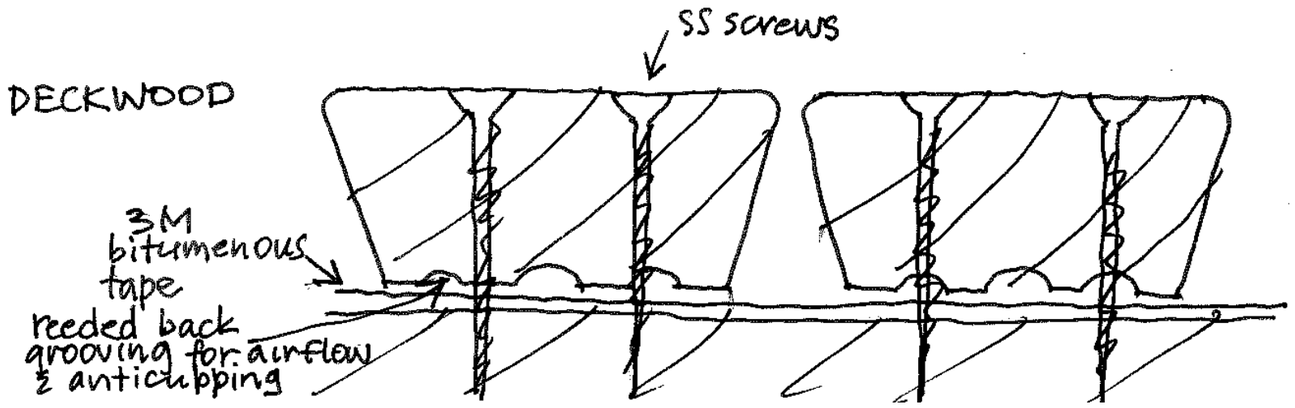
- Rough sawn hardwood allows more penetration of finishing oils
- Rough sawn better for decking, boardwalks in the weather for slip resistance (can remove splinters by coarse sanding or wire brushing)
- Need R11 or R12 as a minimum
- Nominate boards for decking to have a clear face. (i.e. no longitudinal or radial shelling, knots, surface gum or veins etc..)

Outdoor Structures Australia

"Deckwood" / "Joistwood" – specific shapes & proportions.

Stable sizes are less than 3.5:1. (i.e. 145x45mm, 120x35mm)

Durability Class 1 hardwood is used for good reason



Examples of timber face imperfections


Radial shelling

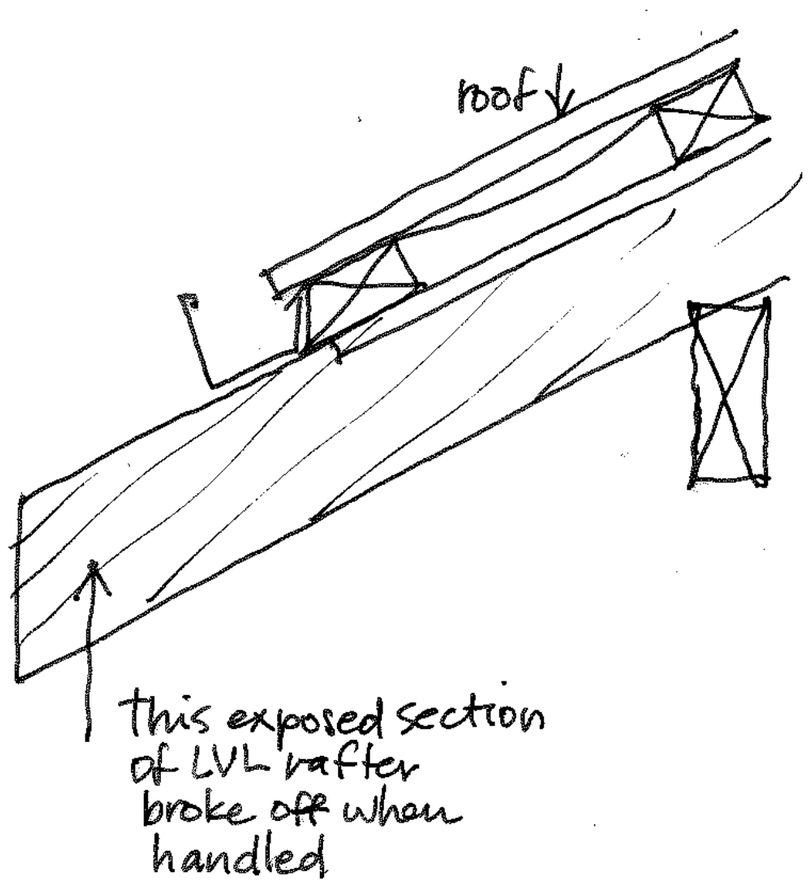

Knot


QE11 Courts hardwood decking

What about LVL joists & bearers externally?

- Evenly painted is not good - some paints allow water through but not out
- Rafter tails on Gibson house on Stradbroke – broke off in your hand
- Do not use LVL in exposed weather situations - Verandahs, decks, boardwalks

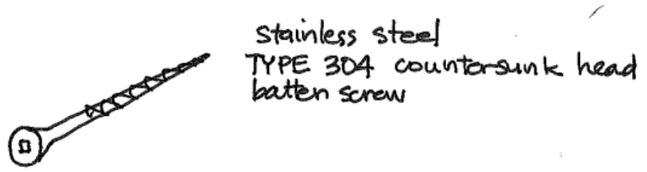
USA Redwood – Pergolas all rotted & failed

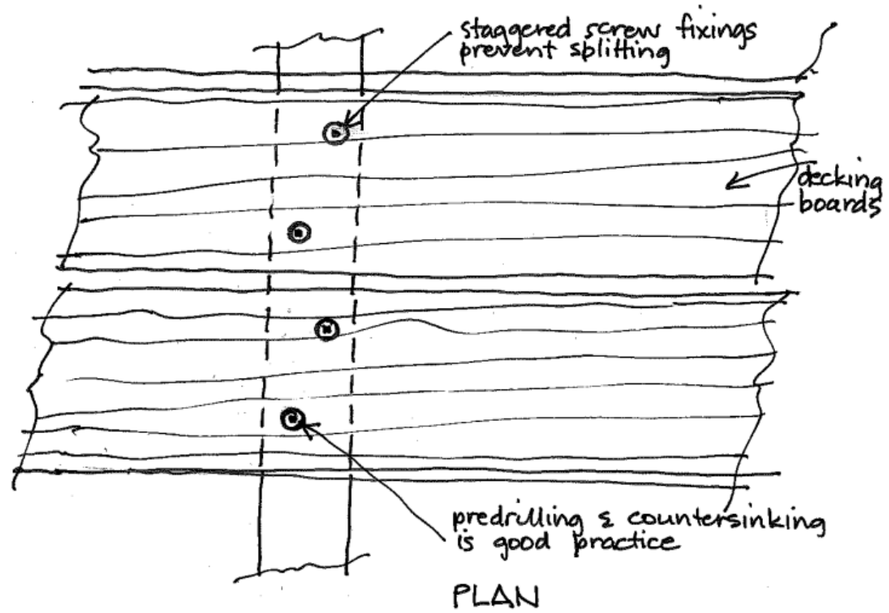


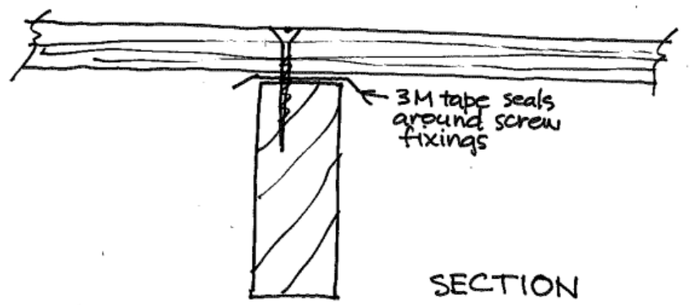
What fixings should be used for external timber?

- Galvanised bolts & coach screws still corrode in CCA treated pine (used in playgrounds) & in hardwoods
- If you use galvanised fixings – need to oversize the drill hole & dip or paint in 2 pack epoxy polyurethane. Such as Dulux Duremax GPE ZP or Weathermax HBR
- Preferably use S.S fixings (bolts, screws, nails, even brackets, trip L guards & gangnails) especially in coastal areas – I worry about salt air in ceilings, under decks etc., with thin galvanised trip L grips & especially joist hangers & gangnails
- 89 x 19 dressing decking can be with fixed S.S. twist nailed but do not use dome heads, you cannot re-sand
- For larger decking boards also I prefer S.S. screws that can be tightened if necessary

  Always cover top of joists with 3M bituminous tape to prevent water entering any cracks in top of joists







What finishing? Leave natural or oil or paint?

Durability class 1 timbers can be left natural to weather but I still prefer to oil finish members <u>all round</u> at construction time – not just the top surface

- Joints - End butt joints indeed all joints need CN emulsion for better life in decking. Also handrail joints, fence rails, step treads to stair stringers
- Old carpenters used thick white enamel paint in these situations & knew to paint the back of hardwood weather boards as they put them up

"Tanacoat oil" or "Wattyl Woodguard Oil" are two oils I use regularly for external hardwood

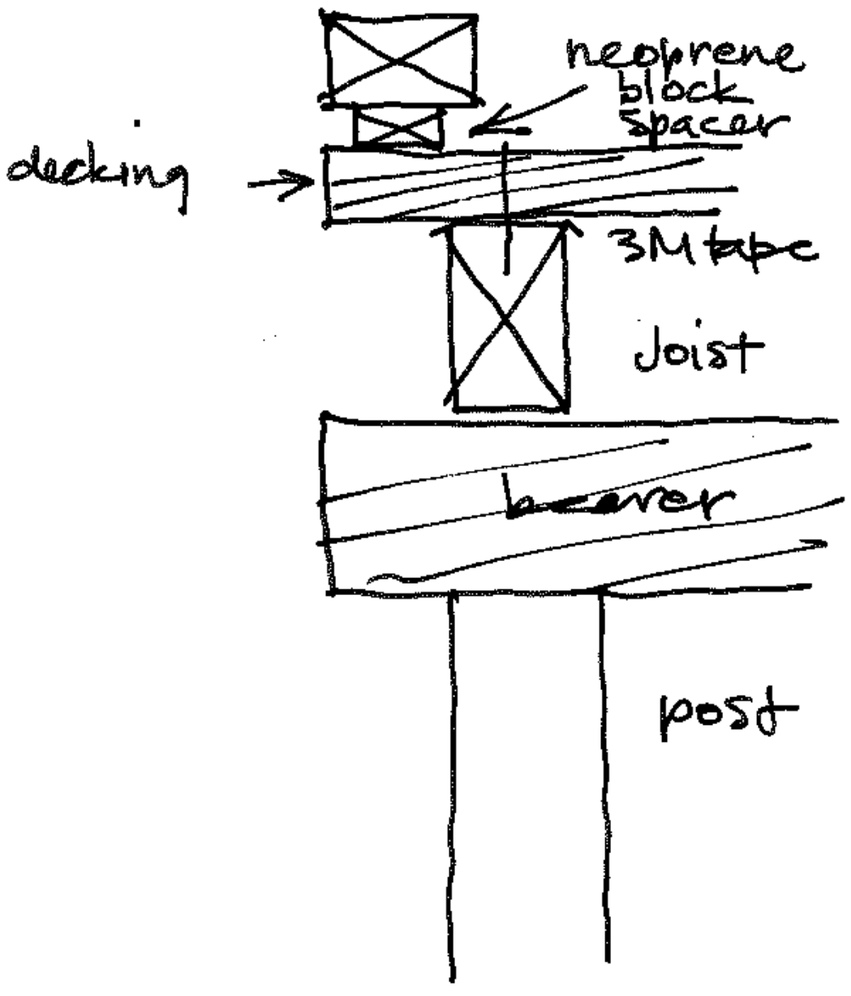
Regularly oiled decks & structures look better & last longer

– For decks re-oil when water stops beading

Good maintenance = Long life

Good detailing of external timber structures is important

- Detail to shed water & not retain it in end grains, joints etc..
- I prefer to not embed timber posts in soil but to use metal stirrups – Galvanised & 2 pack painted where in concrete whether using large circular posts or square sawn sections
- S.S stirrups in coastal areas are preferred



Keeping PWD kick rail up off decking on neoprene block or S.S pipe spacers is good practice.

Handrail covers post endgrain and is bottom-fixed through S.S bracket.

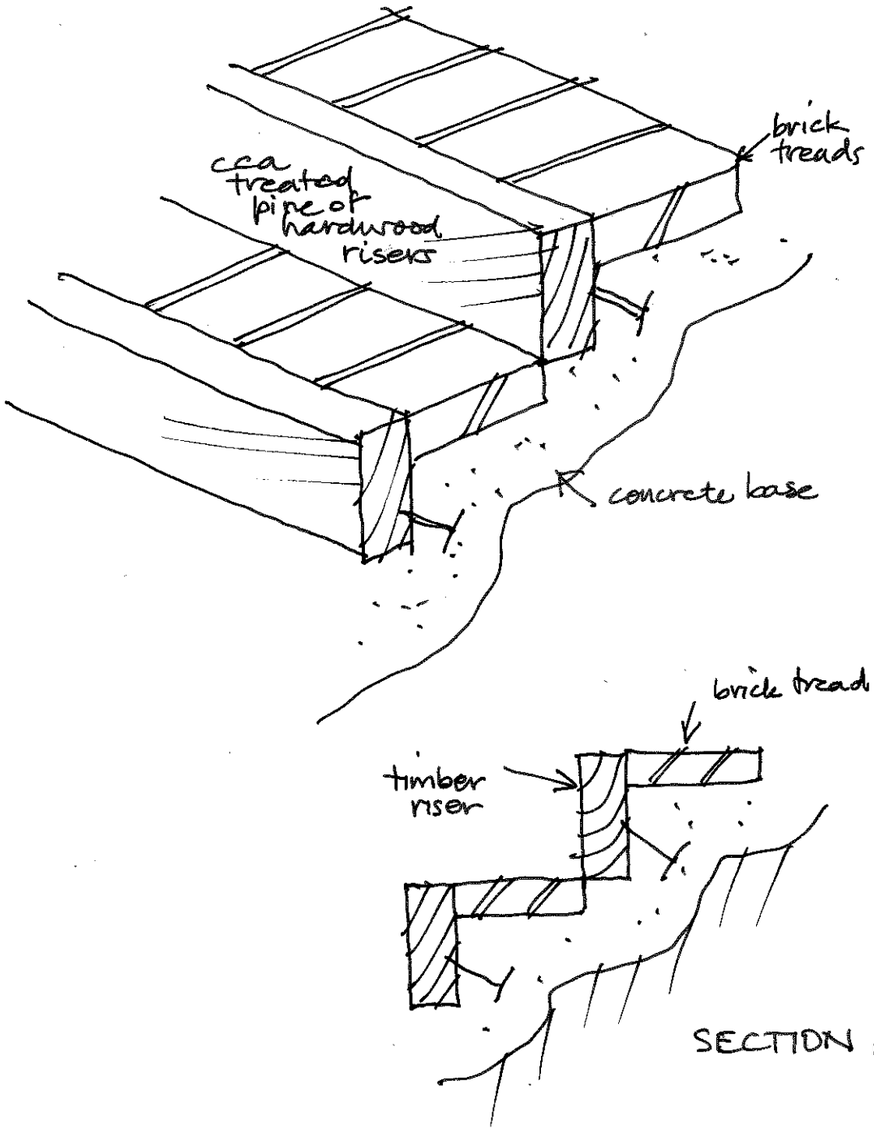
To treat or untreat external timbers?

- Treatment does not penetrate heartwood but protects sapwoods – i.e. on Spotted Gum & Blackbutt
- Still treat telephone poles but still need maintenance at ground level
- Pole house poles still need treatment
- CCA treated pine logs for kids play, raised garden beds, bollards, railings - Use of CCA is questionable today
- LOSP & other treatments
- Do your homework!

<u>Remember</u> timber treatment is a chemical preservative forced under pressure in a tank into the spaces between the cellulose fibres of the timber to protect the cell structure.

Landscape steps

Hardwood or treated pine steps in direct contact with ground or embedded in concrete have rotted out.



Concrete steps with hardwood timber sleeper ends / risers that are failing / warping (above).

Problems with external timbers

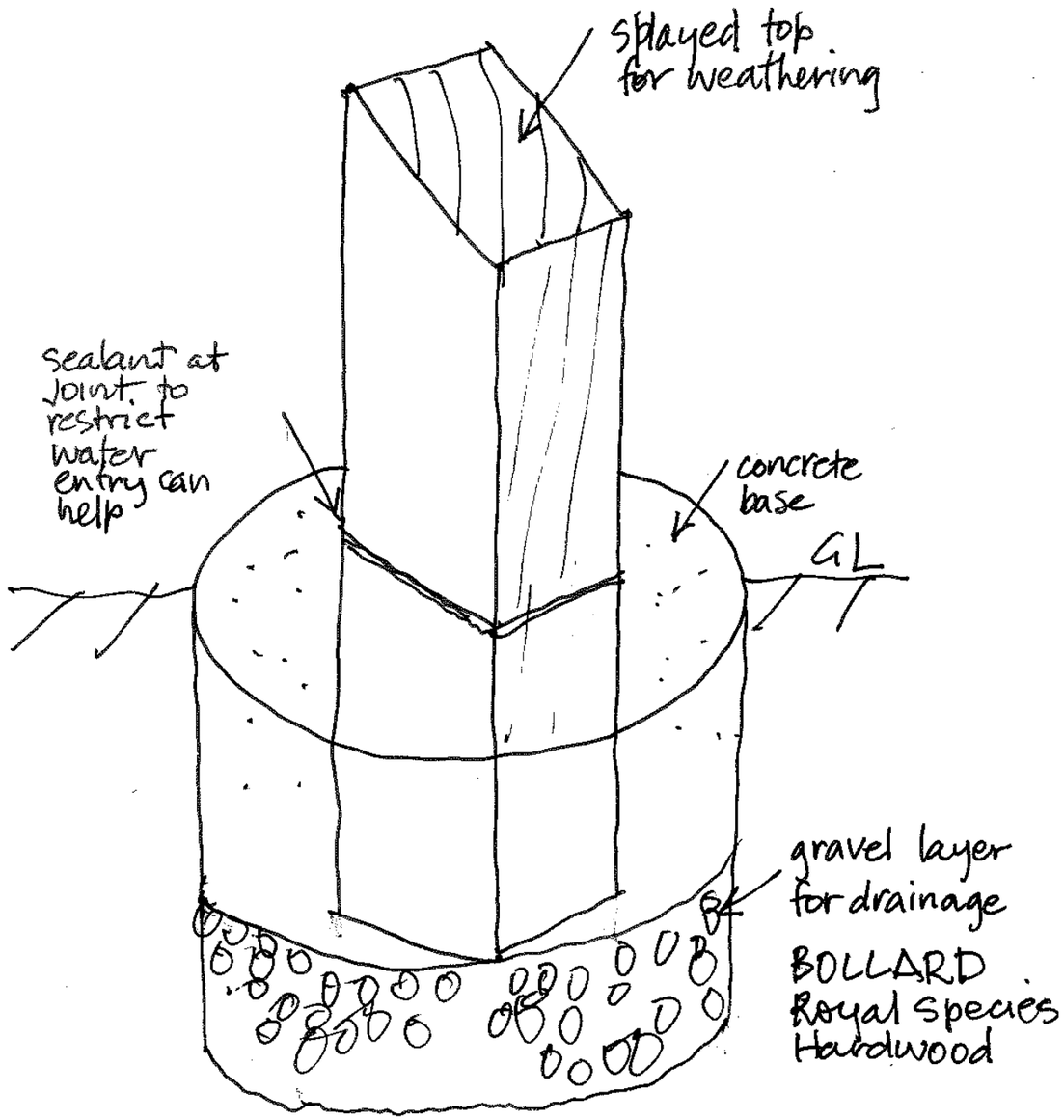
Too many TV shows like “Backyard Blitz” & “Better homes & Gardens” teach bad habits

- Treated pine or hardwood posts put in a hole with bagmix concrete tipped in around it – cannot last
- Nail & staple guns for fence palings, battens & framing - not good
- Timber decks in contact with the ground will rot or be eaten by termites
    - Can not inspect under decks on the ground
    - Condensation on underside of timber decks starts rot

Timber decks close to the ground or timber laid directly on ground or embedded in concrete is not good practice.

Bollards & rails

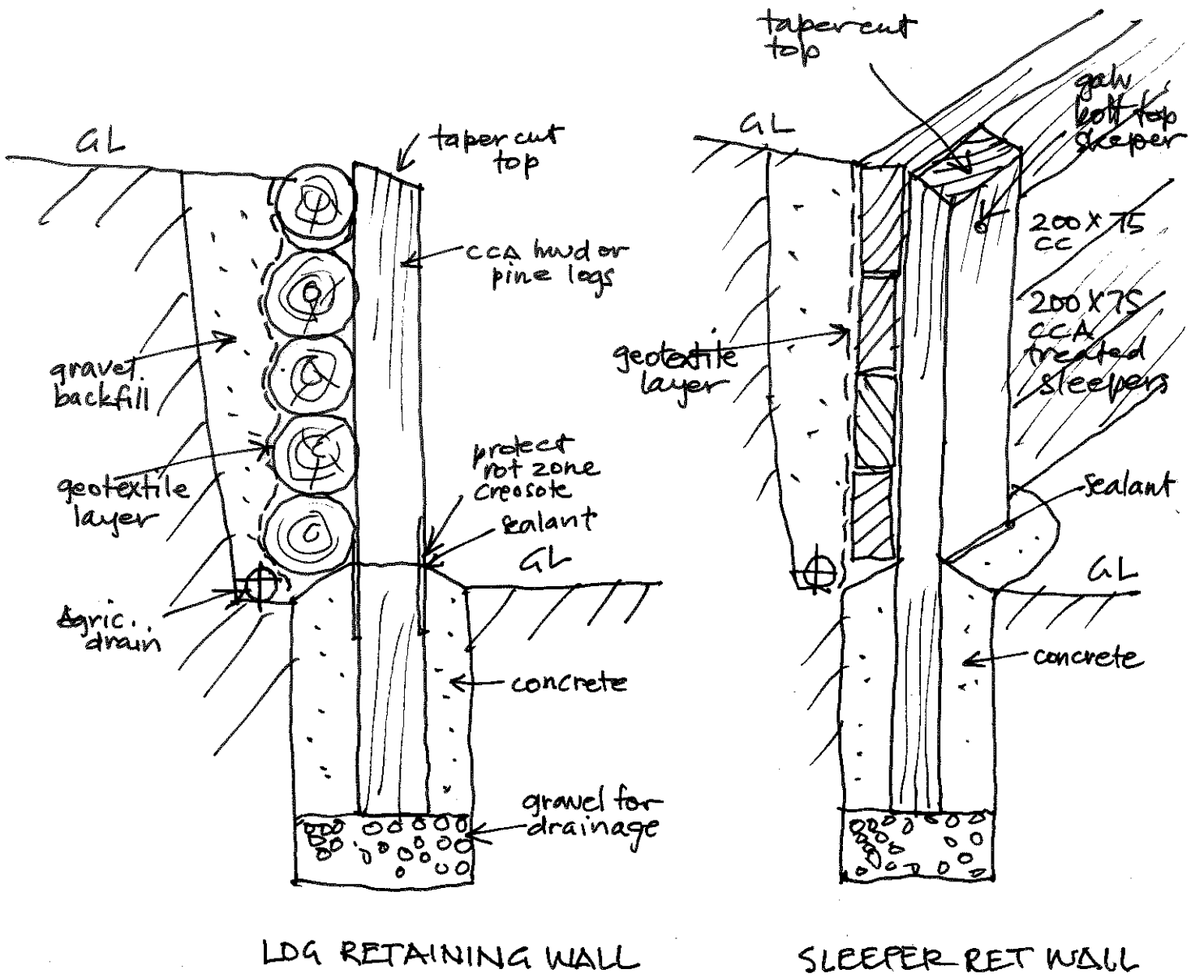
Traditionally just placed in a hole in the soil. They will rot even if CCA treated pine or hardwood that is not Durability Class 1.



Timber retaining walls

Timber retaining walls in CCA treated hardwood or treated pine as logs or sleepers have not been a great success long term but these details (below) give you the best chance for a reasonable life expectancy.

Coat all timbers even if they are treated - especially at rear of wall and where embedded in concrete even if no fines concrete with Cuprinol, copper Naphanate creosote or Samp oil.



Failed CCA treated pine retaining wall (above).

Raised timber sleeper garden bed at a school (below).

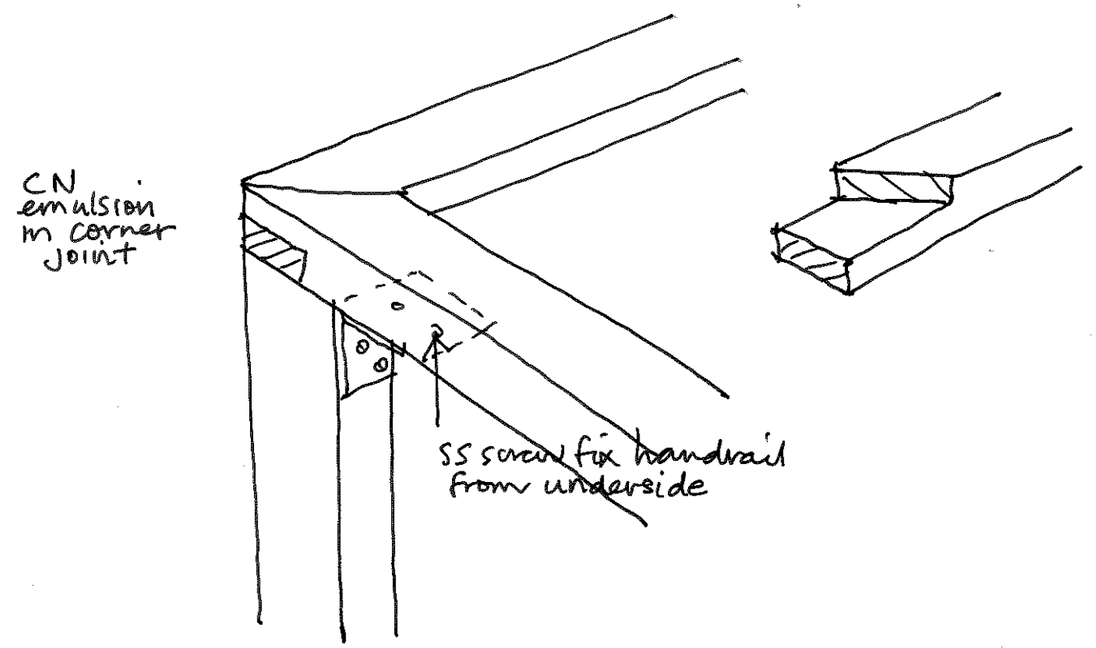
Park & street furniture

Worked with Outdoor Structures Australia to design a better table & seat combination and a seat/table. Both designs were installed at:

- Kings Beach Foreshore Redevelopment
- Caloundra State High School etc..

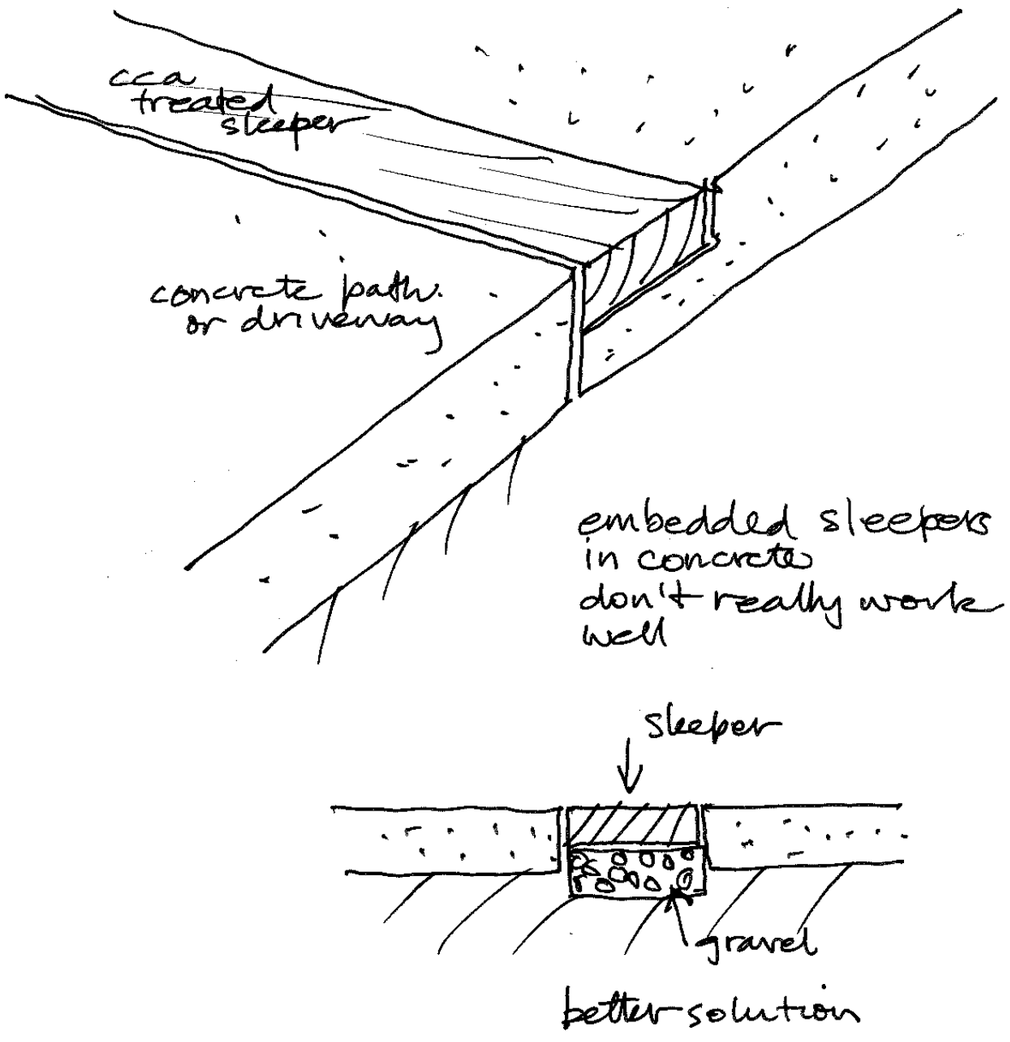
Handrails

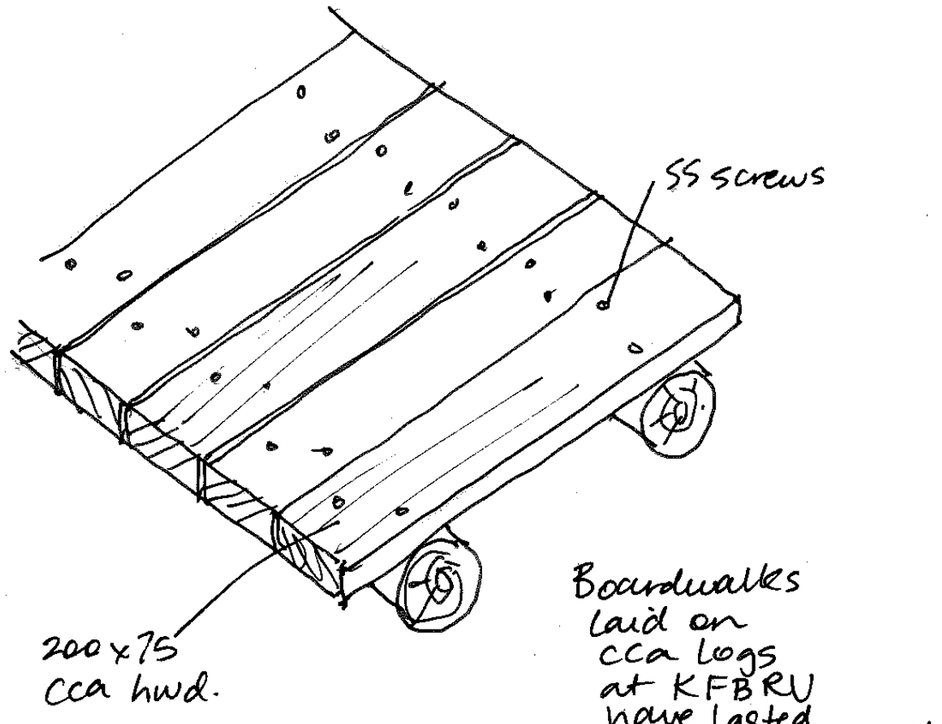
Handrail details to protect end grain of posts and allow fixing of handrail from underside.



Timber in contact with ground

Timber that is in contact with the ground or embedded in concrete is a problem.

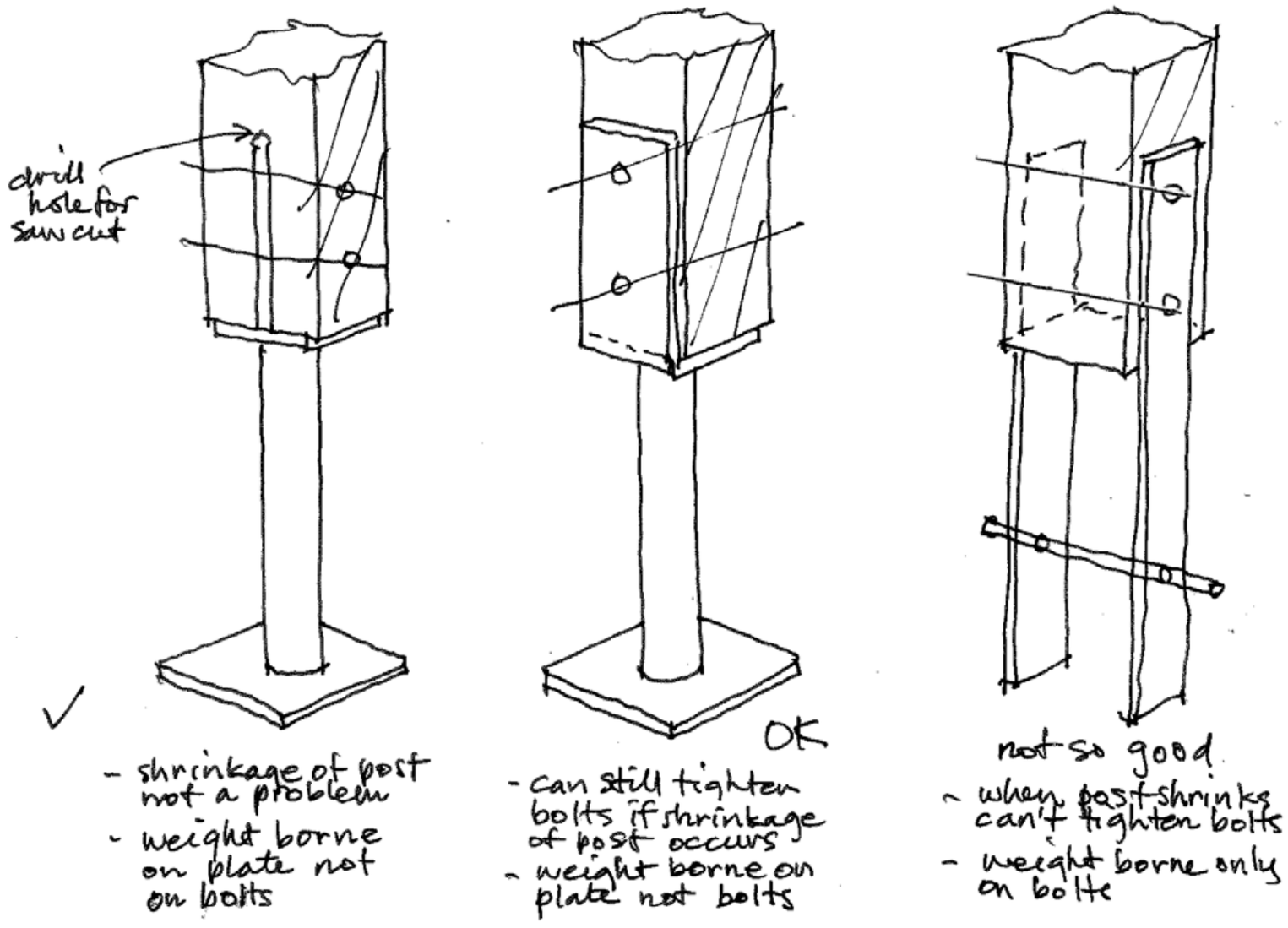




Post bases

For pergolas, decks, boardwalks and fences Durability Class 1 hardwood or treated pine.

Do not embed post in concrete, use a galvanised or S.S stirrups. Various types shown below:

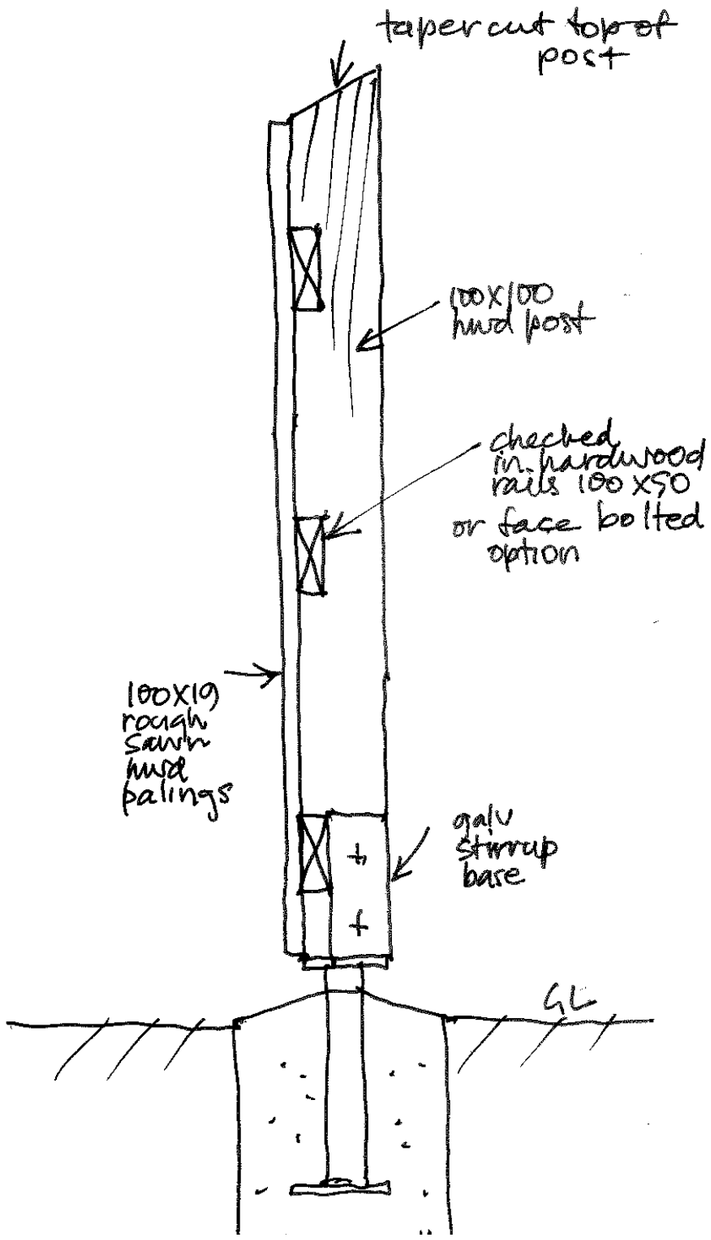


Fences

Many failed fences are due to posts embedded directly in the ground or in concrete.

It is best to use a galvanised stirrup for post bases.

TOP RAIL DETAIL FOR FENCE



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