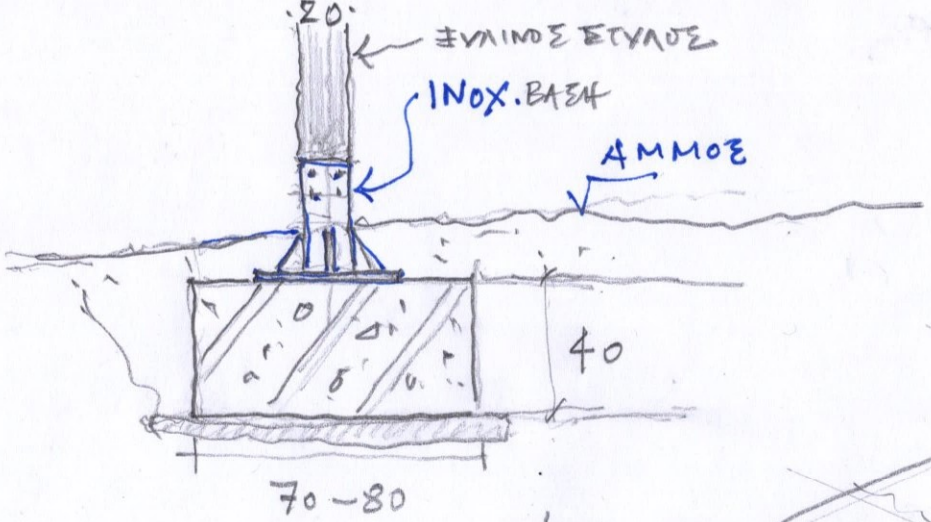

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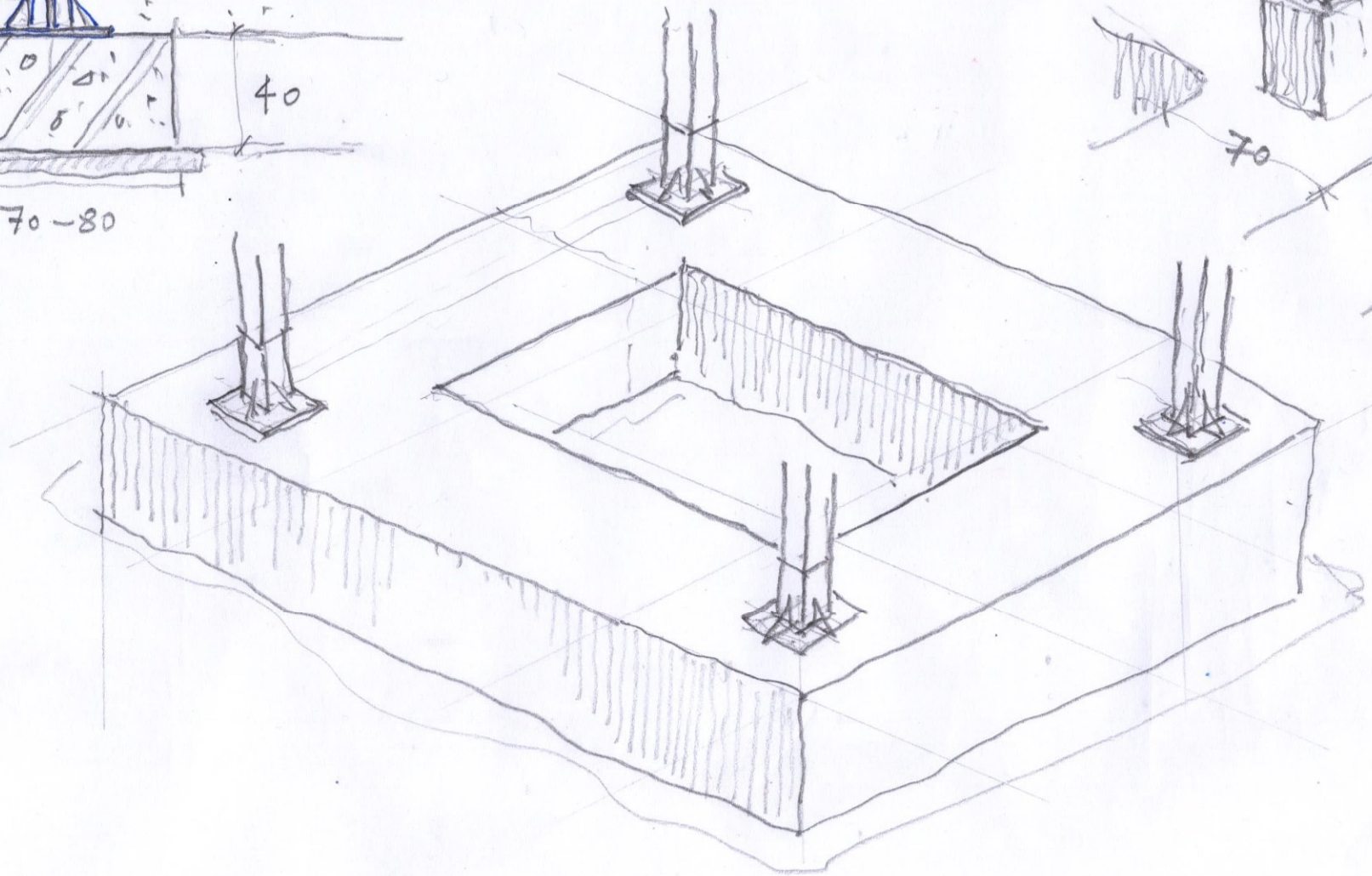

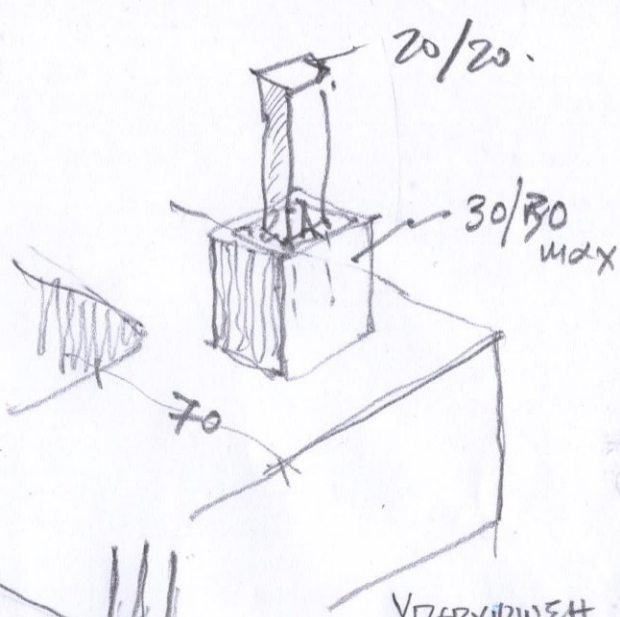

ΥΠΑΡΥΦΩΣΗ ΕΔΡΑΣΗΣ ΜΕ ΥΠΟΣΤΥΛΩΜΑΤΑ

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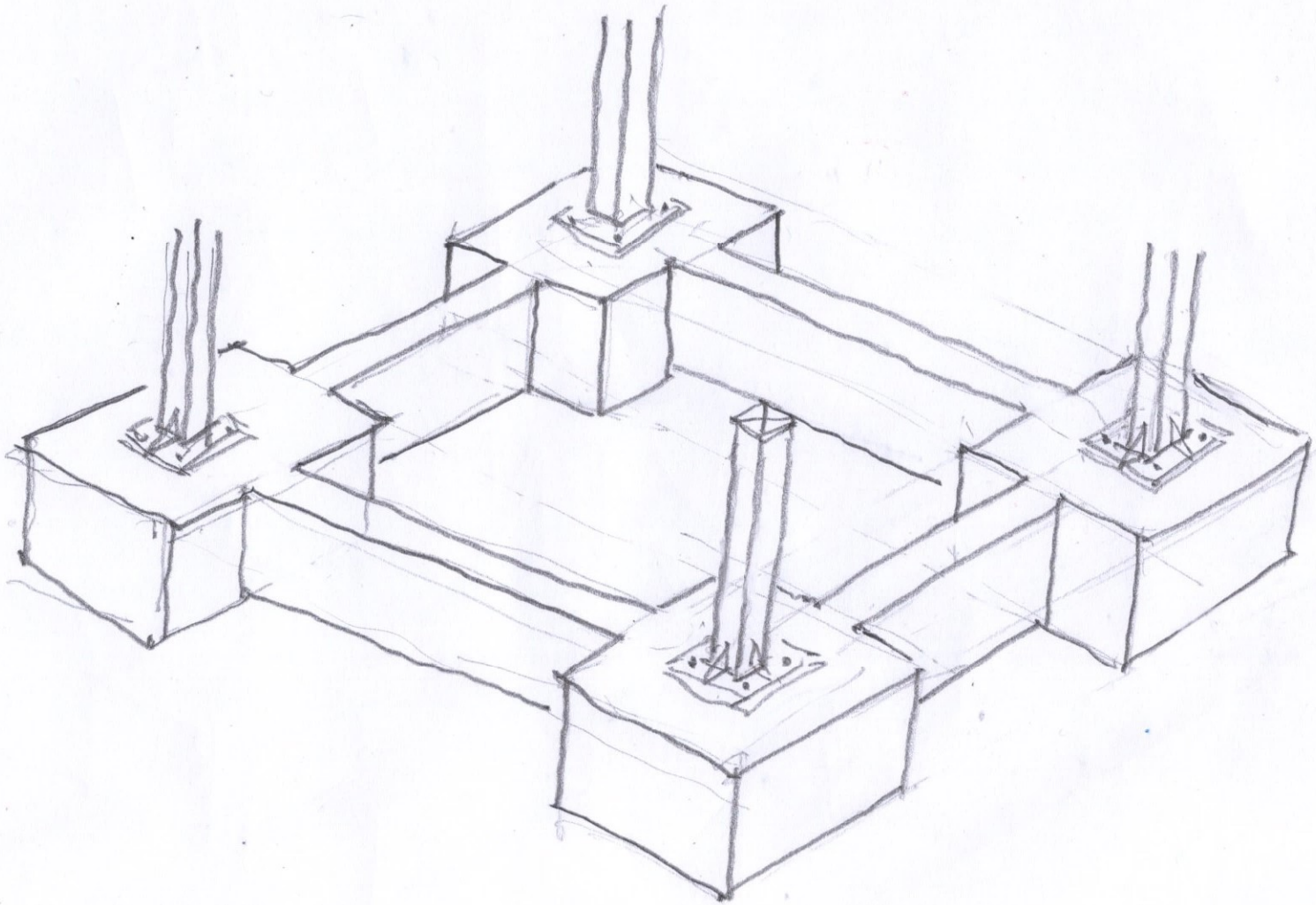
(ΚΛΕΙΣΤΟ ΣΧΗΜΑ)



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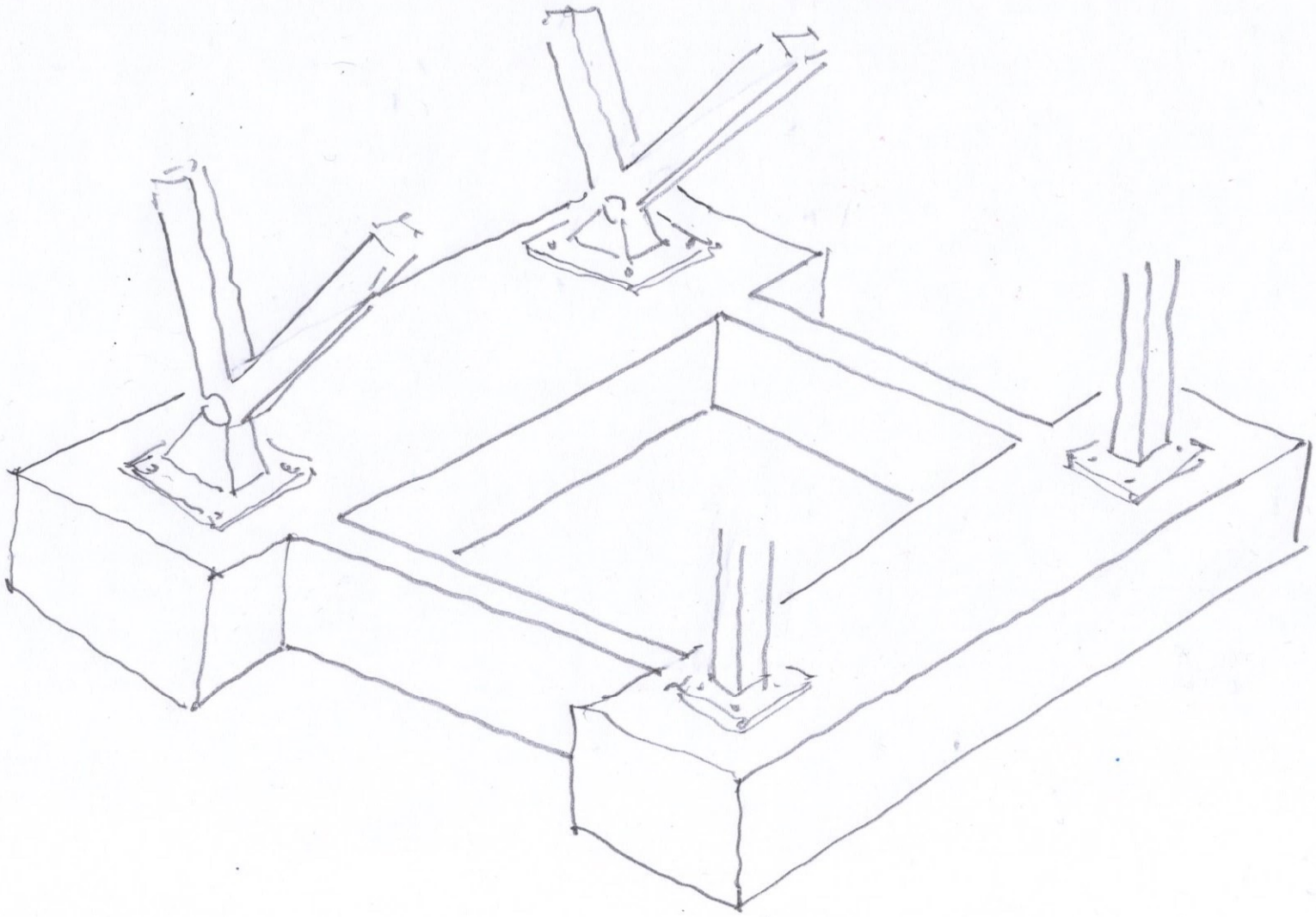

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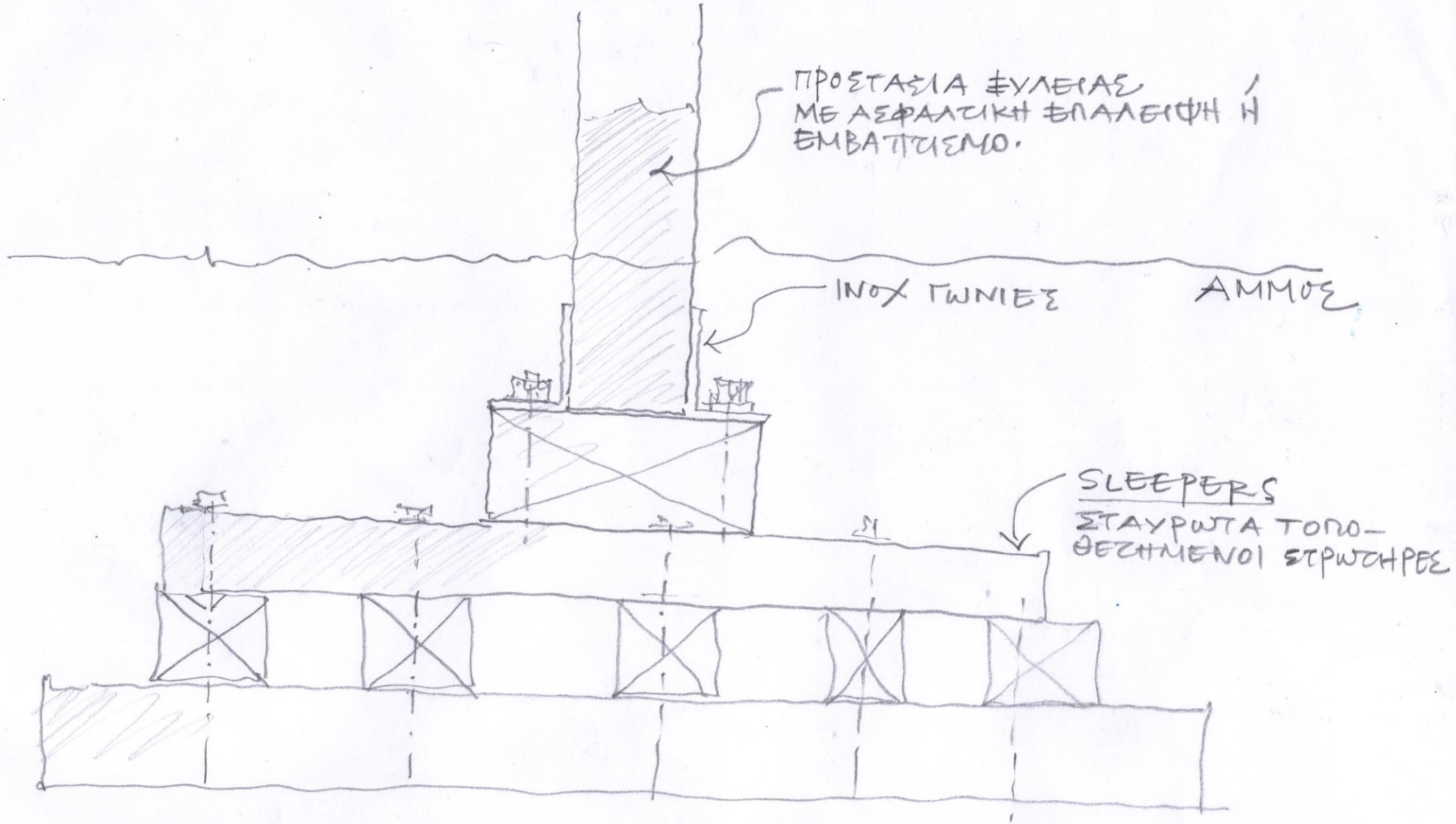
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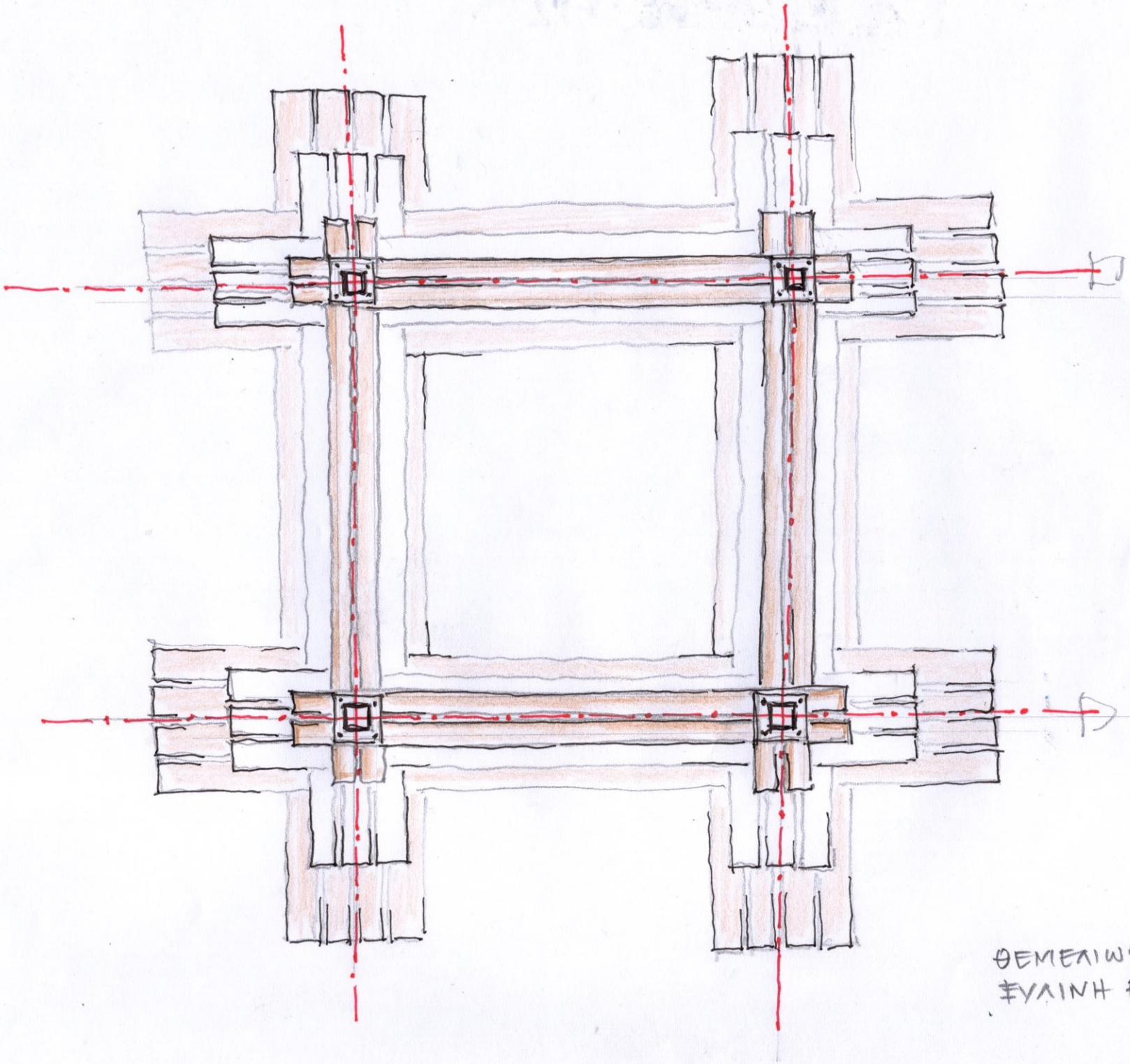
ΙΝΟΧ ΓΩΝΙΕΣ
ΑΜΜΟΣ
SLEEPERS
ΣΤΑΥΡΩΤΑ ΤΟΠΟ-ΘΕΤΗΜΕΝΟΙ ΣΤΡΩΤΗΡΕΣ
ΞΥΛΙΝΑ ΠΕΔΙΛΑ

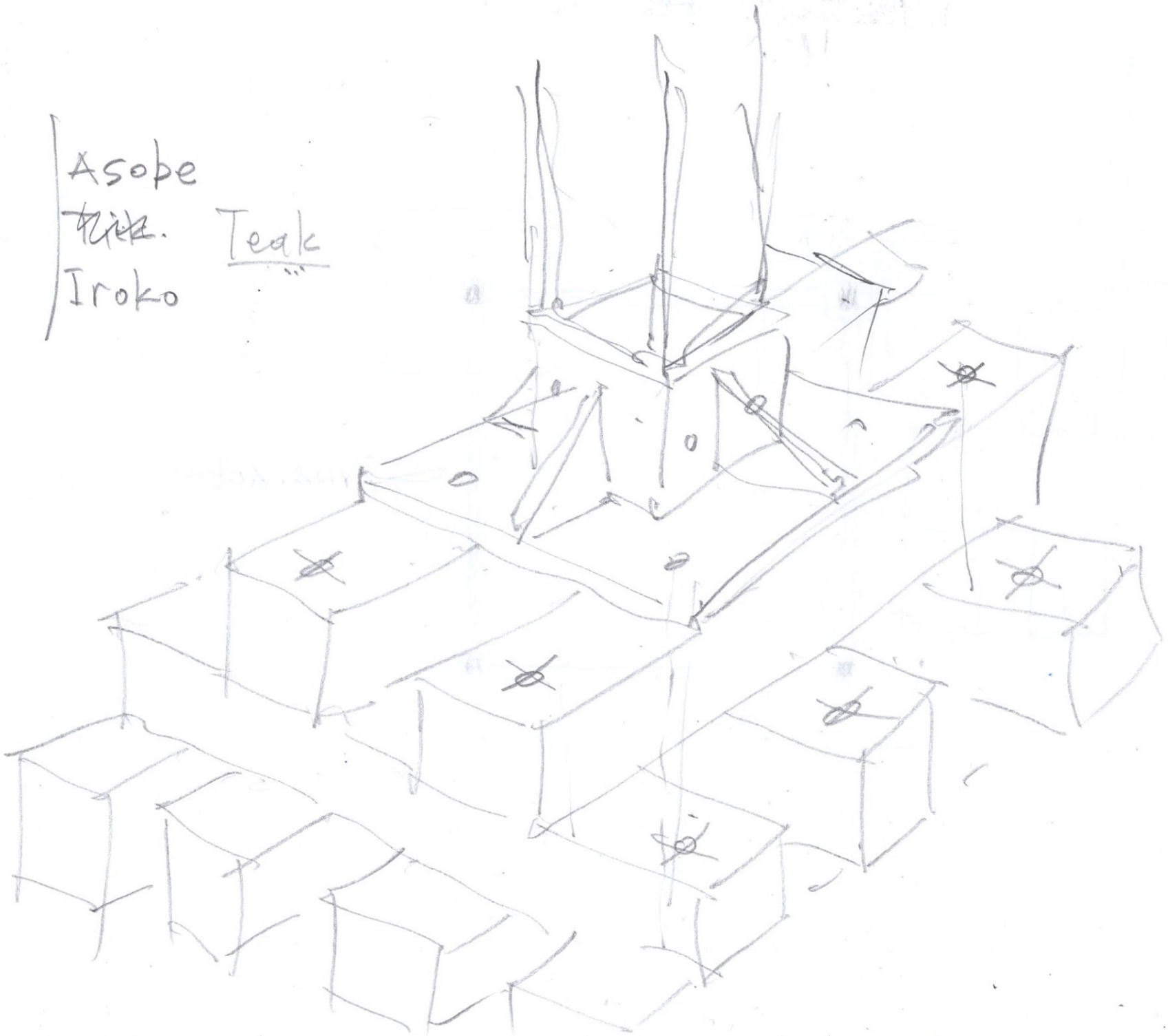


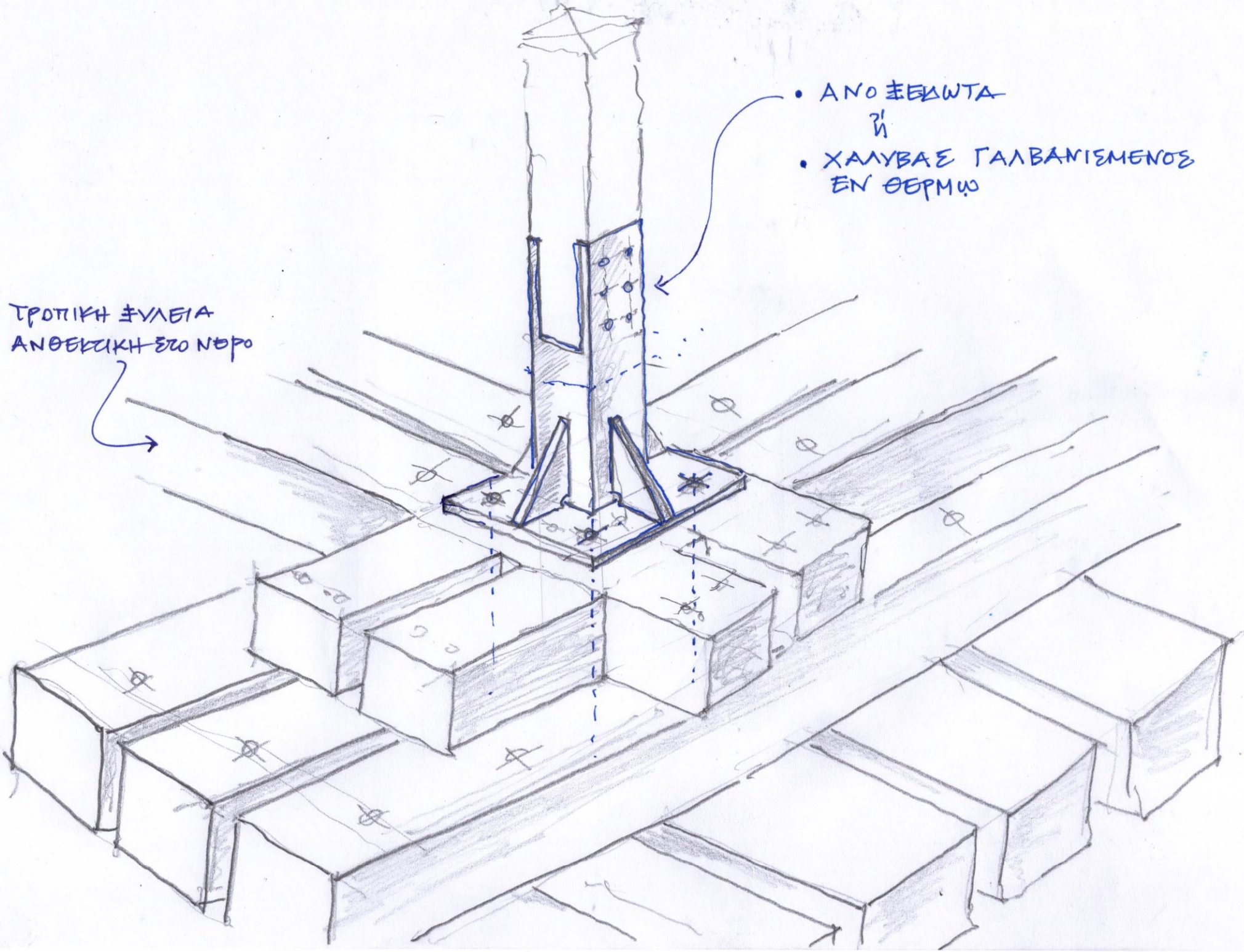
ΘΕΜΕΛΙΩΣΗ ΣΕ
ΞΥΛΙΝΗ ΣΕΧΑΡΑ

Asobe

~~Wikk.~~ Teak

Iroko




• ΑΝΟΞΕΙΔΩΤΑ
ή
• ΧΑΛΥΒΑΣ ΓΑΛΒΑΝΙΣΜΕΝΟΣ ΕΝ ΘΕΡΜΩ
ΤΡΟΠΙΚΗ ΞΥΛΕΙΑ
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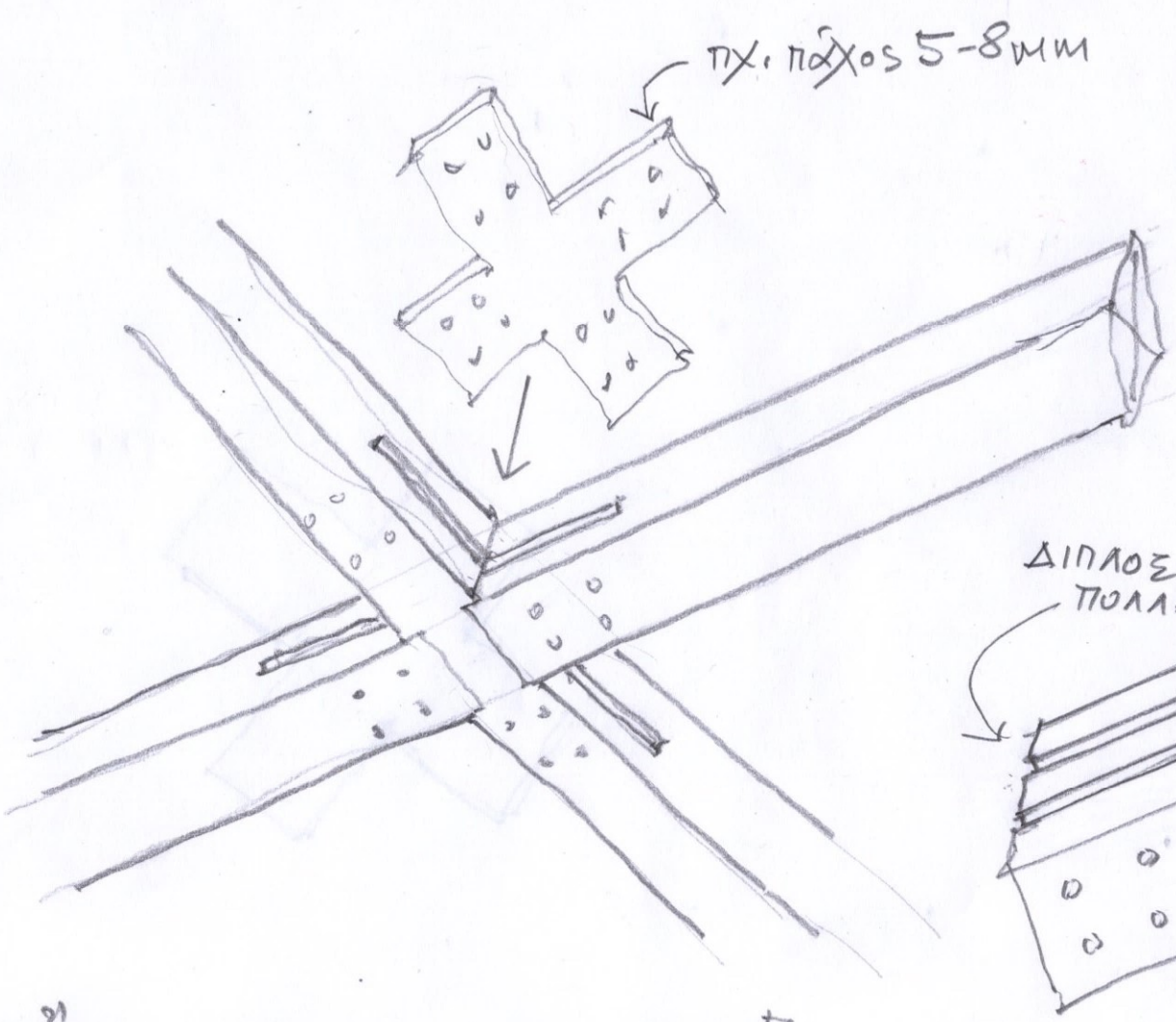

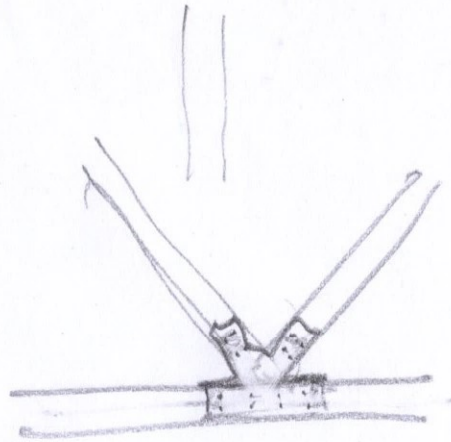

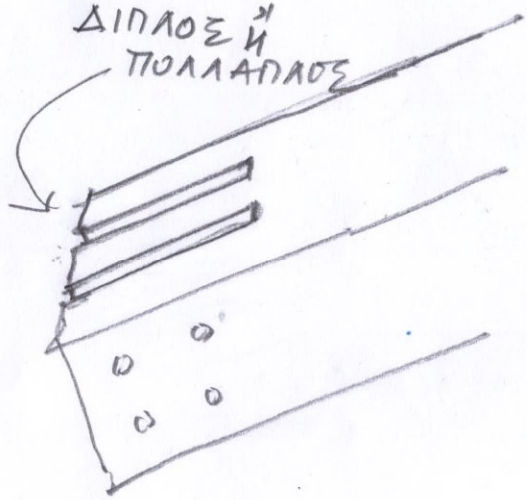

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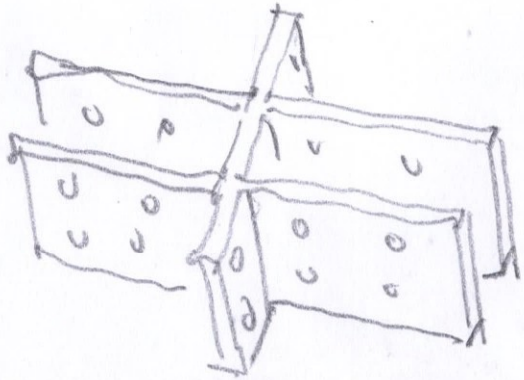
ΓΑΛΒΑΝΙΣΜΕΝΟΣ
ΧΑΛΥΒΑΣ



ΕΝΙΣΧΥΣΗ ΚΟΜΒΩΝ
ΜΕ ΕΙΔΙΚΑ ΣΧΕΔΙΑΣΜΕΝΑ
ΕΝΘΕΤΑ ΕΛΑΣΜΑΤΑ Ή
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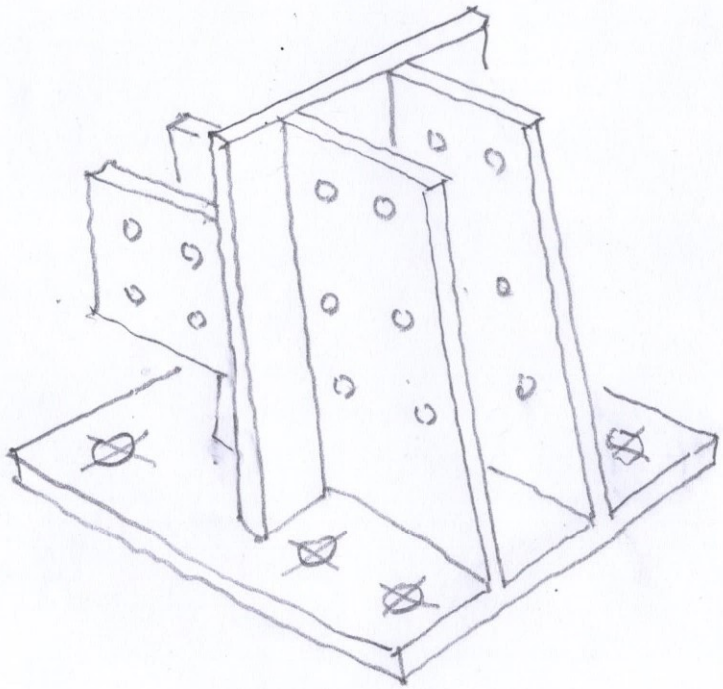
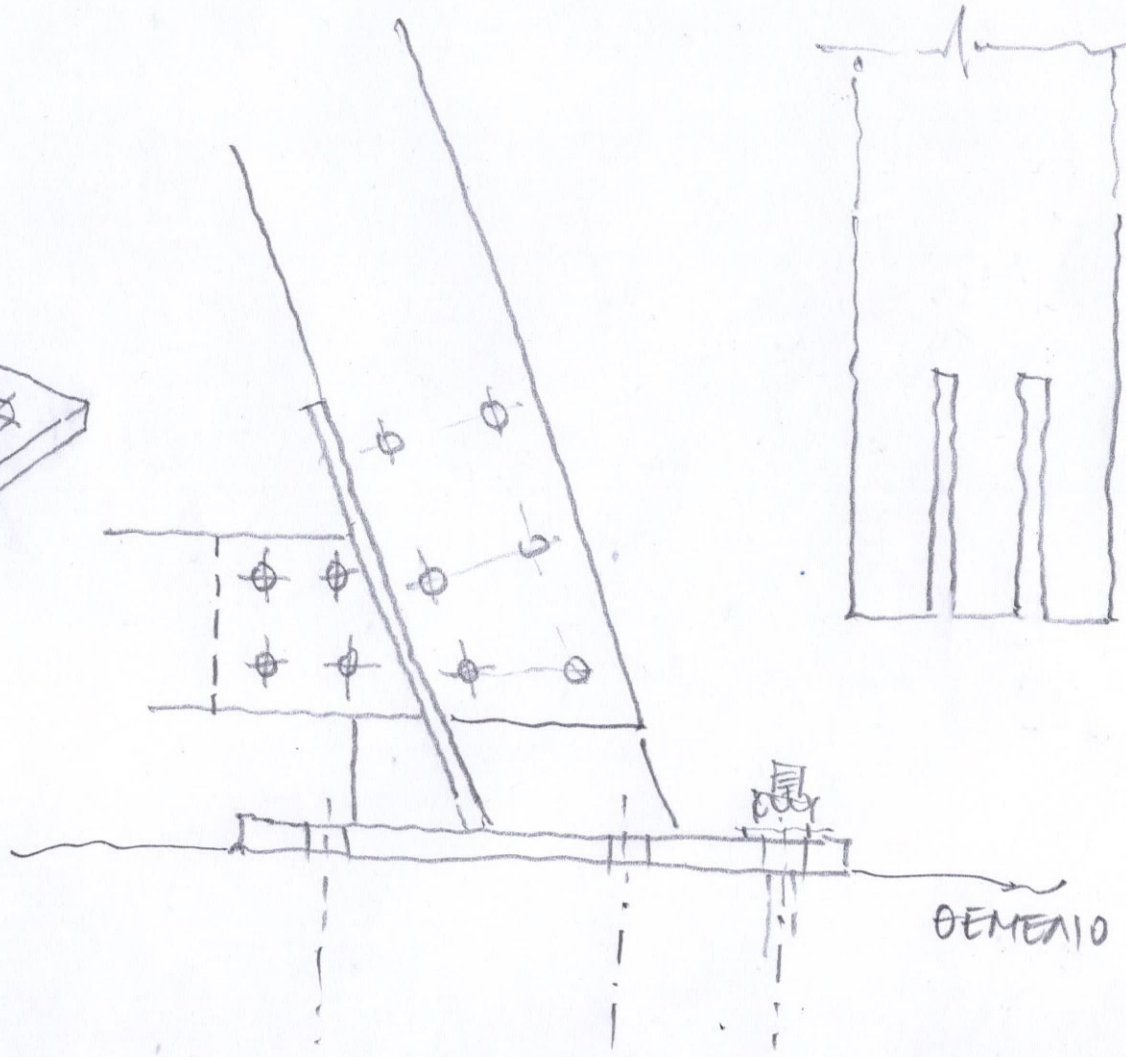
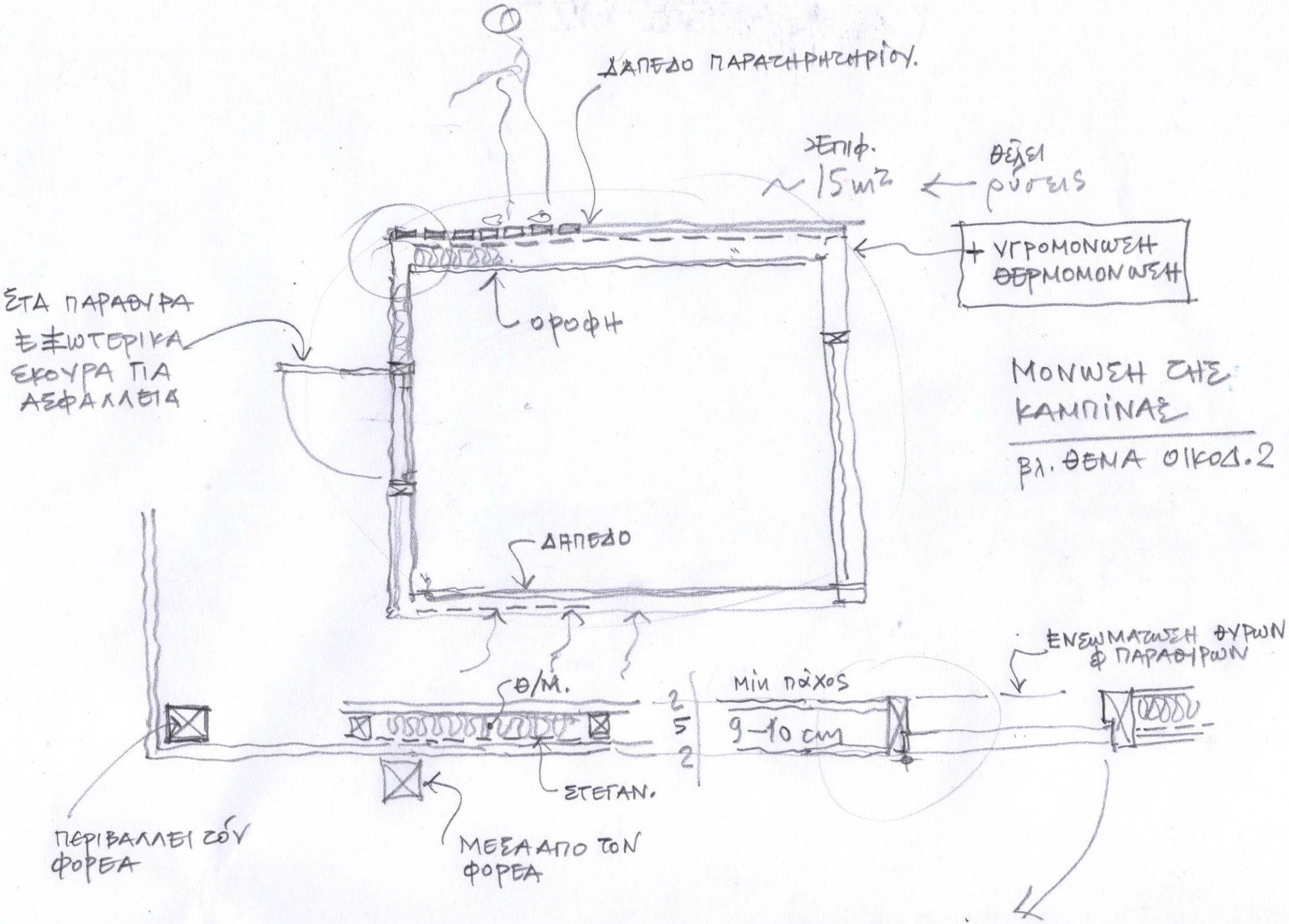
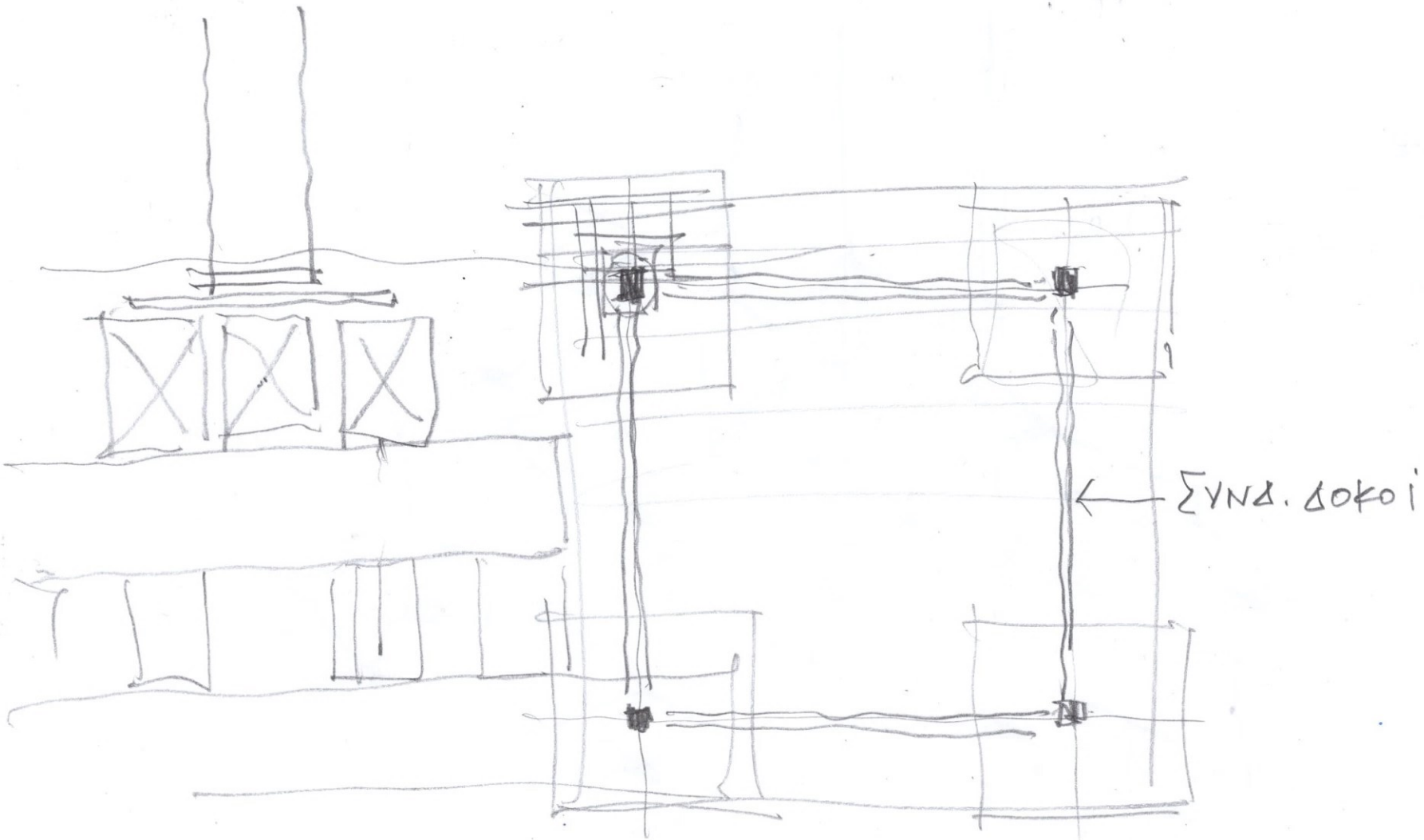


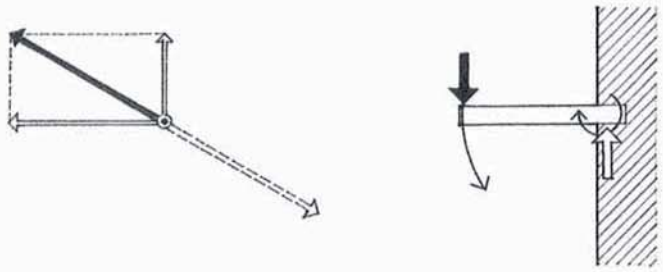


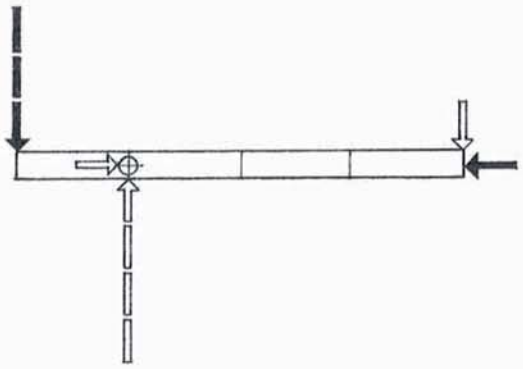
ΑΝΑΛΟΓΑ ΤΗ ΓΕΩΜΕΤΡΙΑ ΤΟ ΦΟΡΕΑ ΜΑΣ ΜΠΟΡΟΥΜΕ ΝΑ ΣΥΝΘΕΣΟΥΜΕ ΤΟ ΚΑΤΑΛΛΗΛΟ ΚΟΜΒΟΕΛΑΣΜΑ.

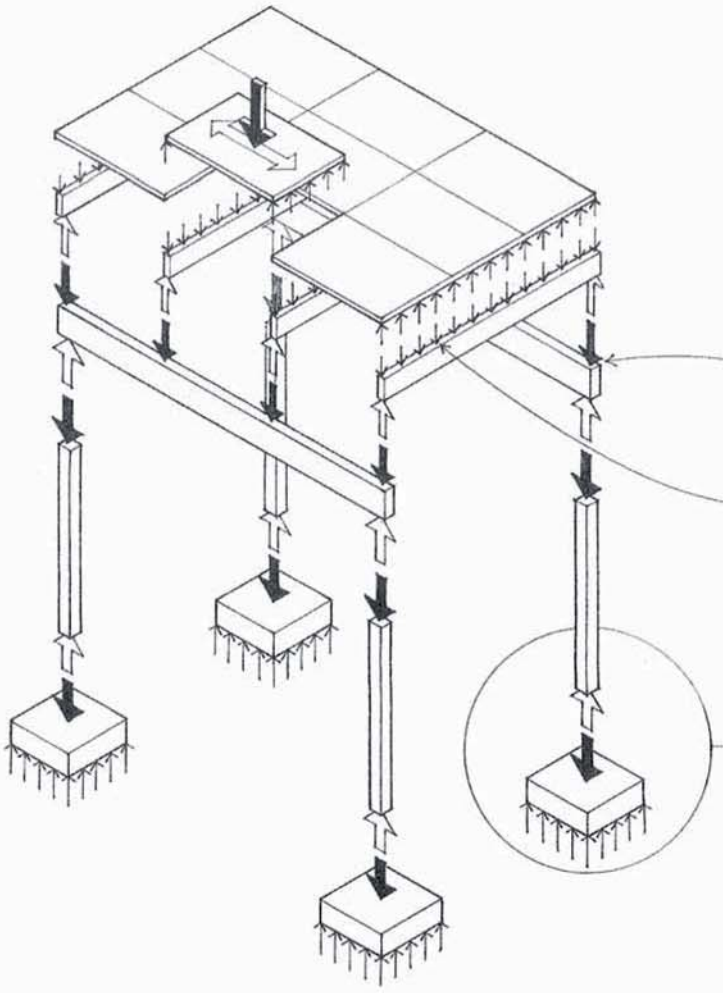

ΔΑΠΕΔΟ ΠΑΡΑΣΚΗΝΙΟΥ.
Επιφ. ~15 m²
θέση ρύσεις
+ ΥΓΡΟΜΟΝΩΣΗ ΘΕΡΜΟΜΟΝΩΣΗ
ΟΡΟΦΗ
ΣΤΑ ΠΑΡΑΘΥΡΑ ΕΞΩΤΕΡΙΚΑ ΕΚΟΥΡΑ ΓΙΑ ΑΣΦΑΛΕΙΑ
ΜΟΝΩΣΗ ΣΤΗΣ ΚΑΜΠΙΝΑΣ
βλ. ΘΕΜΑ ΟΙΚΟΔ.2
ΔΑΠΕΔΟ
ΕΝΣΩΜΑΤΩΣΗ ΘΥΡΩΝ & ΠΑΡΑΘΥΡΩΝ
Θ/Μ.
Μίν πάχος 9–10 cm
2 5 2
ΣΤΕΓΑΝ.
ΠΕΡΙΒΑΛΛΕΙ ΣΩΛΗΝΑ ΦΟΡΕΑ
ΜΕΣΑ ΑΠΟ ΤΟΝ ΦΟΡΕΑ

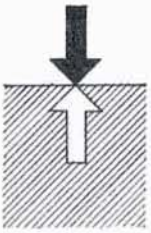

ΣΥΝΔ. ΔΟΚΟΙ

2.12 STRUCTURAL EQUILIBRIUM









In both structural design and analysis, we are concerned first with the magnitude, direction, and point of application of forces, and their resolution to produce a state of equilibrium. Equilibrium is a state of balance or rest resulting from the equal action of opposing forces. In other words, as each structural element is loaded, its supporting elements must react with equal but opposite forces. For a rigid body to be in equilibrium, two conditions are necessary.

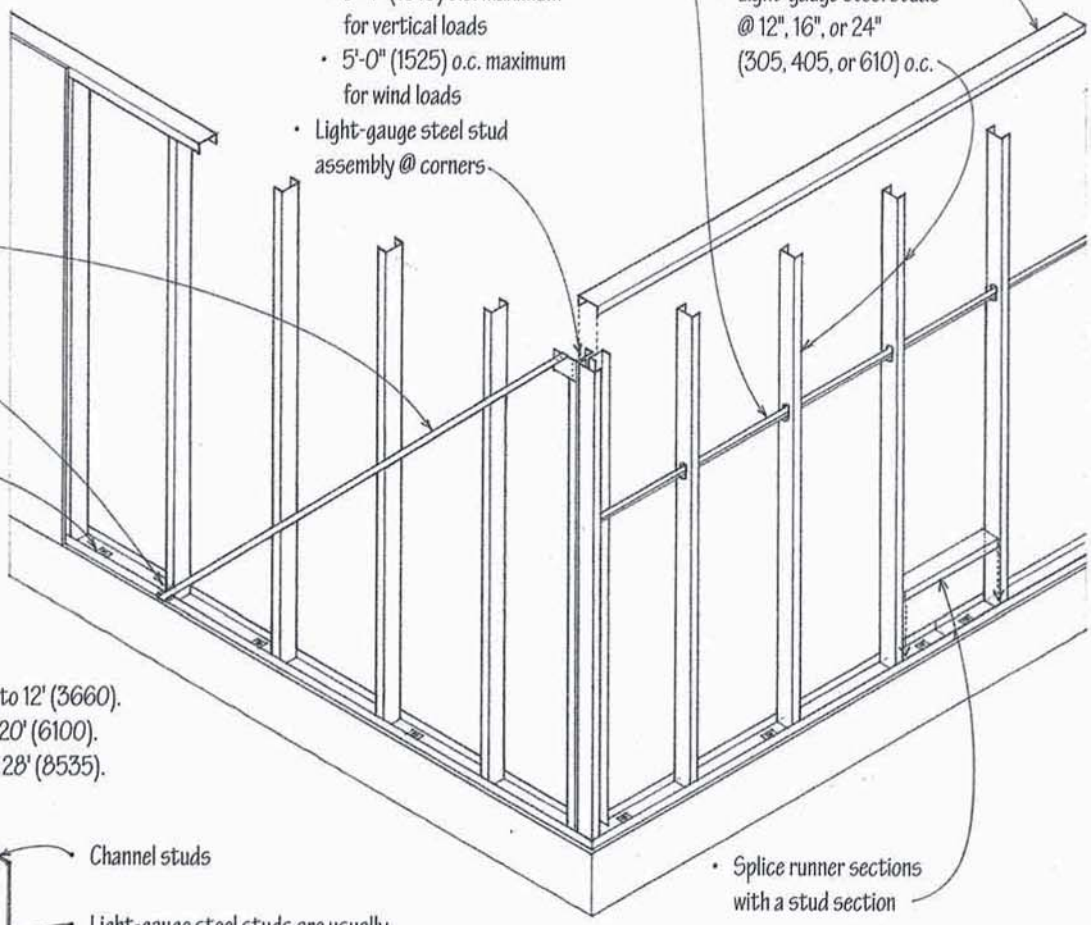
- First, the vector sum of all forces acting on it must equal zero, ensuring translational equilibrium: $\Sigma F_x = 0$; $\Sigma F_y = 0$; $\Sigma F_z = 0$.
- Second, the algebraic sum of all moments of the forces about any point or line must equal zero, ensuring rotational equilibrium: $\Sigma M = 0$.

- Newton's third law of motion, the law of action and reaction, states that for every force acting on a body, the body exerts a force having equal magnitude and the opposite direction along the same line of action as the original force.

- A concentrated load acts on a very small area or particular point of a supporting structural element, as when a beam bears on a post or a column bears on its footing.
- A uniformly distributed load is a load of uniform magnitude extending over the length or area of the supporting structural element, as in the case of the live load on a floor deck or joist, or a wind load on a wall.

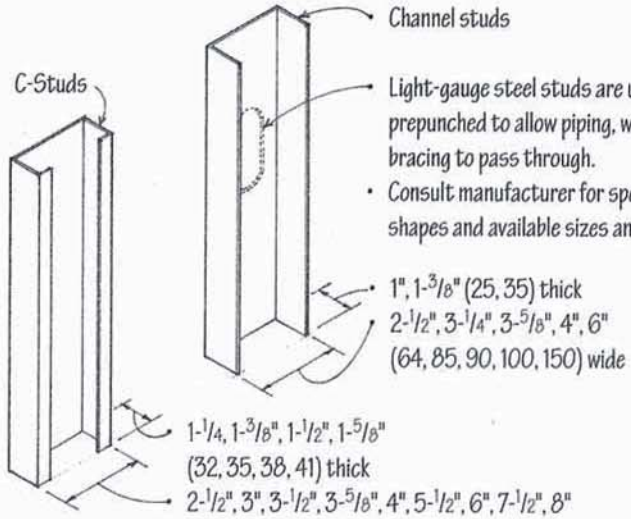
- A free-body diagram is a graphic representation of the complete system of applied and reactive forces acting on a body or an isolated part of a structure. Every elementary part of a structural system has reactions that are necessary for the equilibrium of the part, just as the larger system has reactions at its supports that serve to maintain the equilibrium of the whole.

Light-gauge steel studs are manufactured by cold-forming sheet or strip steel. The cold-formed steel studs can be easily cut and assembled with simple tools into a wall structure that is lightweight, noncombustible, and dampproof. Metal stud walls may be used as nonloadbearing partitions or as bearing walls supporting light-gauge steel joists. As in wood light frame construction, the stud framing contains cavities for utilities and thermal insulation and accepts a wide range of finishes.

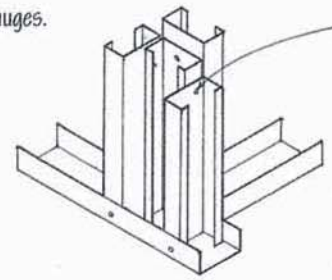


- Horizontal channel bracing
- Walls less than 10' (3050) high:
- 2 rows @ 1/3 height for vertical loads
  - 1 row @ mid-height for wind loads
- Walls over 10' (3050) high:
  - 3'-4" (1015) o.c. maximum for vertical loads
  - 5'-0" (1525) o.c. maximum for wind loads
- Light-gauge steel stud assembly @ corners
- Continuous runner channel
- Light-gauge steel studs @ 12", 16", or 24" (305, 405, or 610) o.c.
- Diagonal steel strap bracing welded to studs and runners
- Secure strap connection to stud and runner with a steel gusset plate or welds.
- Angle clip welded to stud and bolted to foundation.
- Splice runner sections with a stud section

- Limit height of 3-5/8" (90) studs to 12' (3660).
- Limit height of 6" (150) studs to 20' (6100).
- Limit height of 8" (205) studs to 28' (8535).



- C-Studs
- Channel studs
- Light-gauge steel studs are usually prepunched to allow piping, wiring, and bracing to pass through.
- Consult manufacturer for specific shapes and available sizes and gauges.
- 1", 1-3/8" (25, 35) thick
  2-1/2", 3-1/4", 3-5/8", 4", 6" (64, 85, 90, 100, 150) wide
- 1-1/4, 1-3/8", 1-1/2", 1-5/8" (32, 35, 38, 41) thick
  2-1/2", 3", 3-1/2", 3-5/8", 4", 5-1/2", 6", 7-1/2", 8" (64, 75, 90, 100, 140, 150, 190, 205) wide

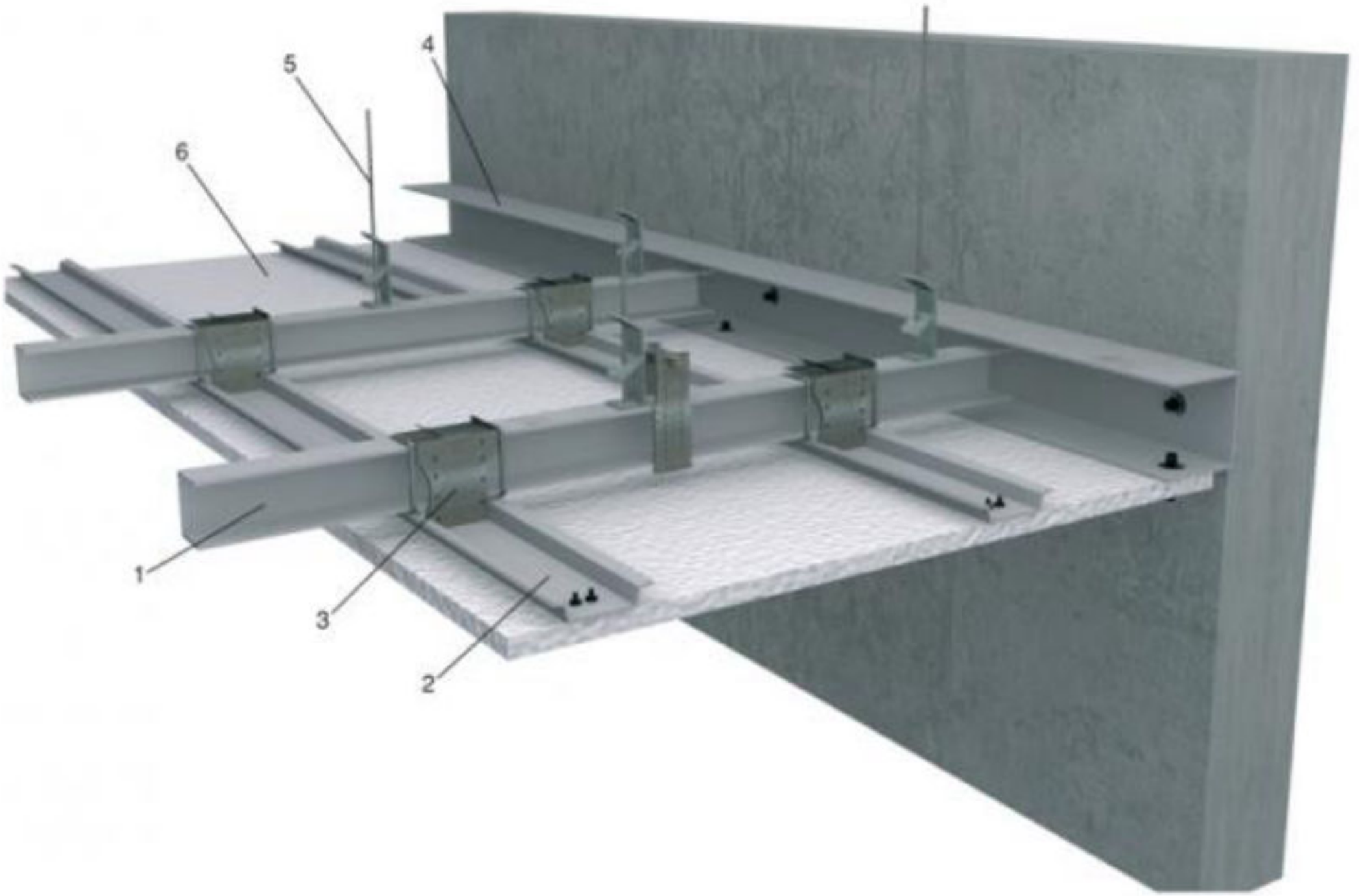


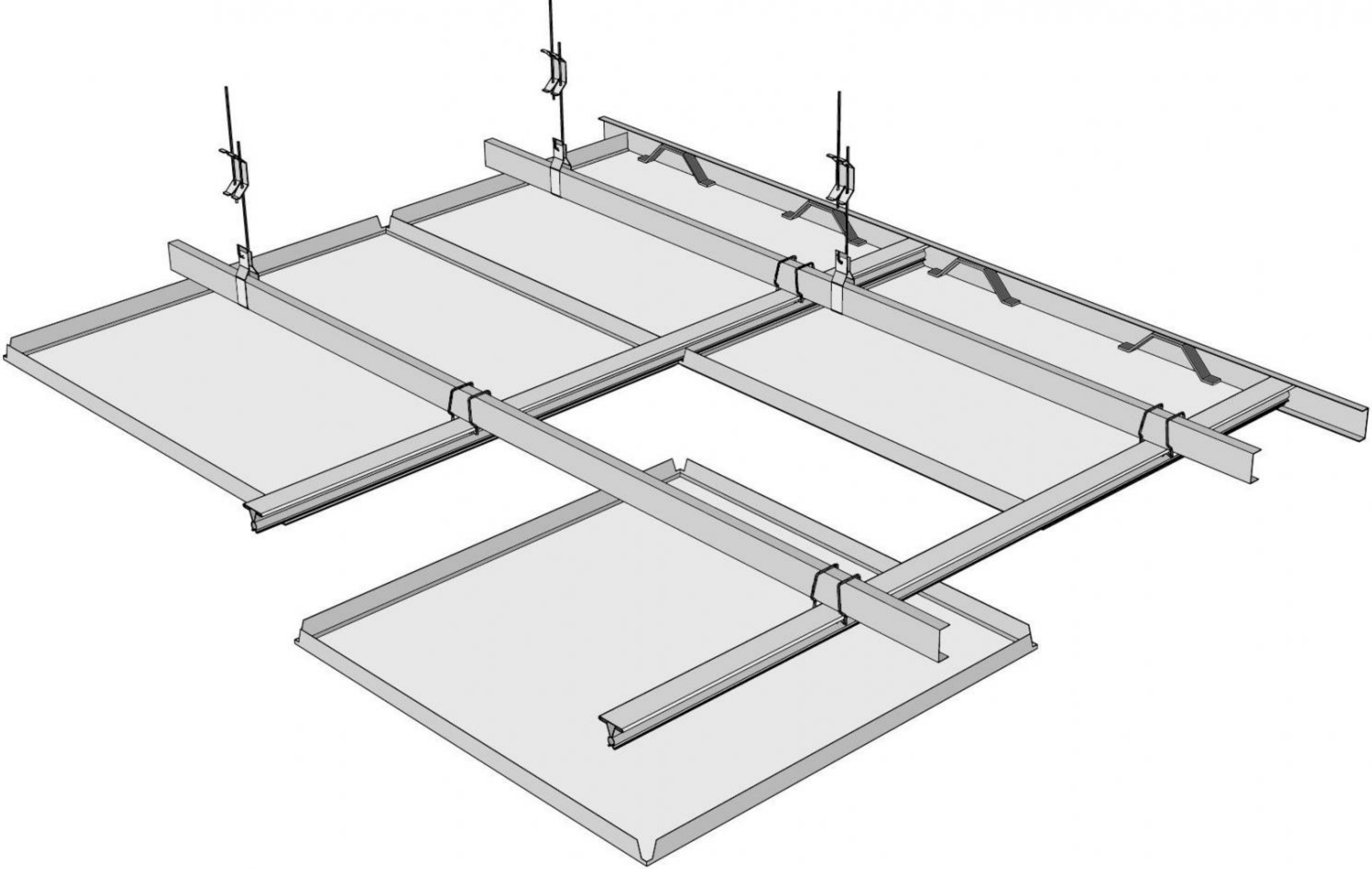
- Light-gauge stud walls are framed, sheathed, insulated, and finished as in wood light frame construction.
- Connections are made with self-drilling, self-tapping screws inserted with an electric or pneumatic tool, or with pneumatically driven pins.

- See 4.23–4.25 for light-gauge joist framing.
- See 5.46 for wall sheathing and 7.44 for thermal insulation options.

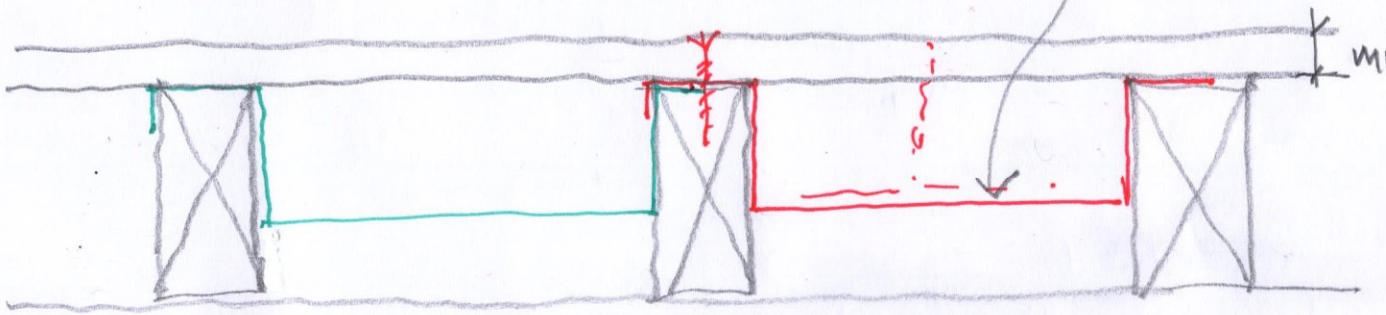
CSI MasterFormat 05 40 00 Cold-formed Metal Framing
CSI MasterFormat 05 41 00 Structural Metal Stud Framing


CE - SECURITY ALUMINUM HELLAS - DUROSTEEL - PRODUCT PATENTED - EN 14196 - A1 - 2186 - C/27-08/27-0
CE - SECURITY ALUMINUM HELLAS - DUROSTEEL - PRODUCT PATENTED - EN 14196 - A1 - 2186 - C/27-08/27-0

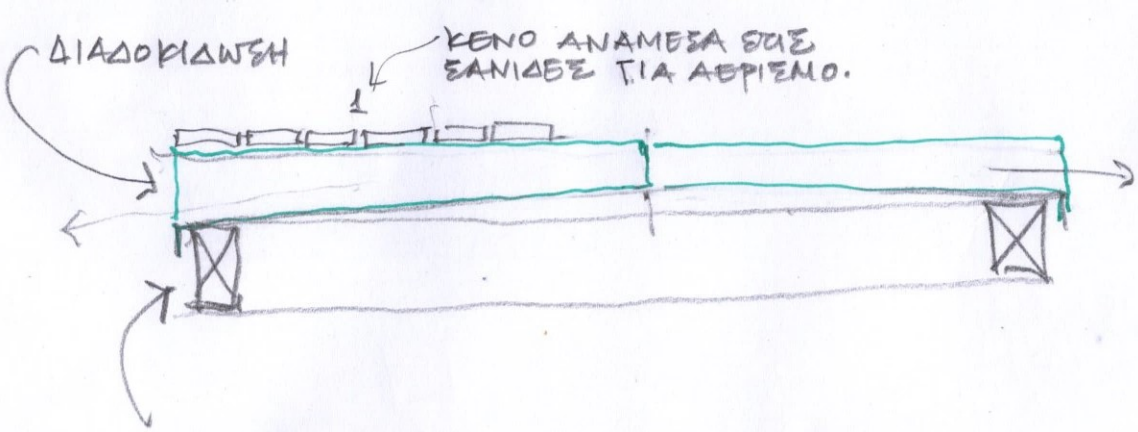

4
5
6
1
3
2

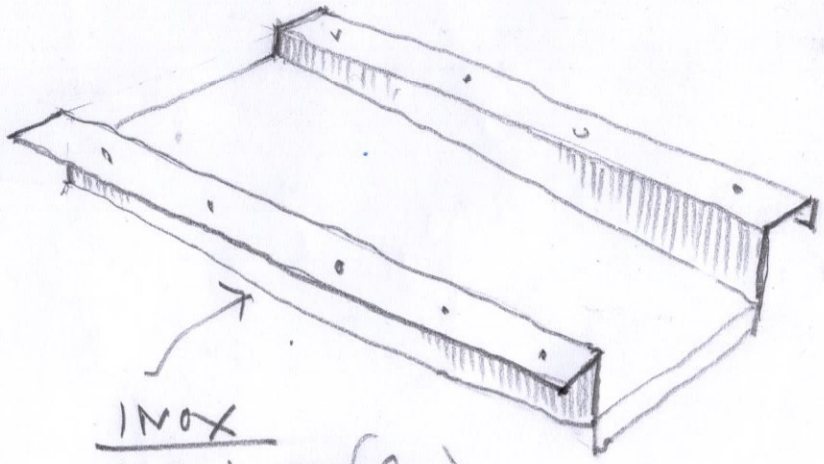


ΤΟΠΟΘΕΤΗΣΗ ΣΤΡΑΝΤΖΑΡΙΣΤΩΝ
ΜΕΤΑΛΛΙΚΩΝ ΦΥΛΛΩΝ ΑΝΑΜΕΣΑ
ΣΤΗ ΔΙΑΣΤΟΛΙΔΩΣΗ (ΜΕ ΚΑΙΣΗ)

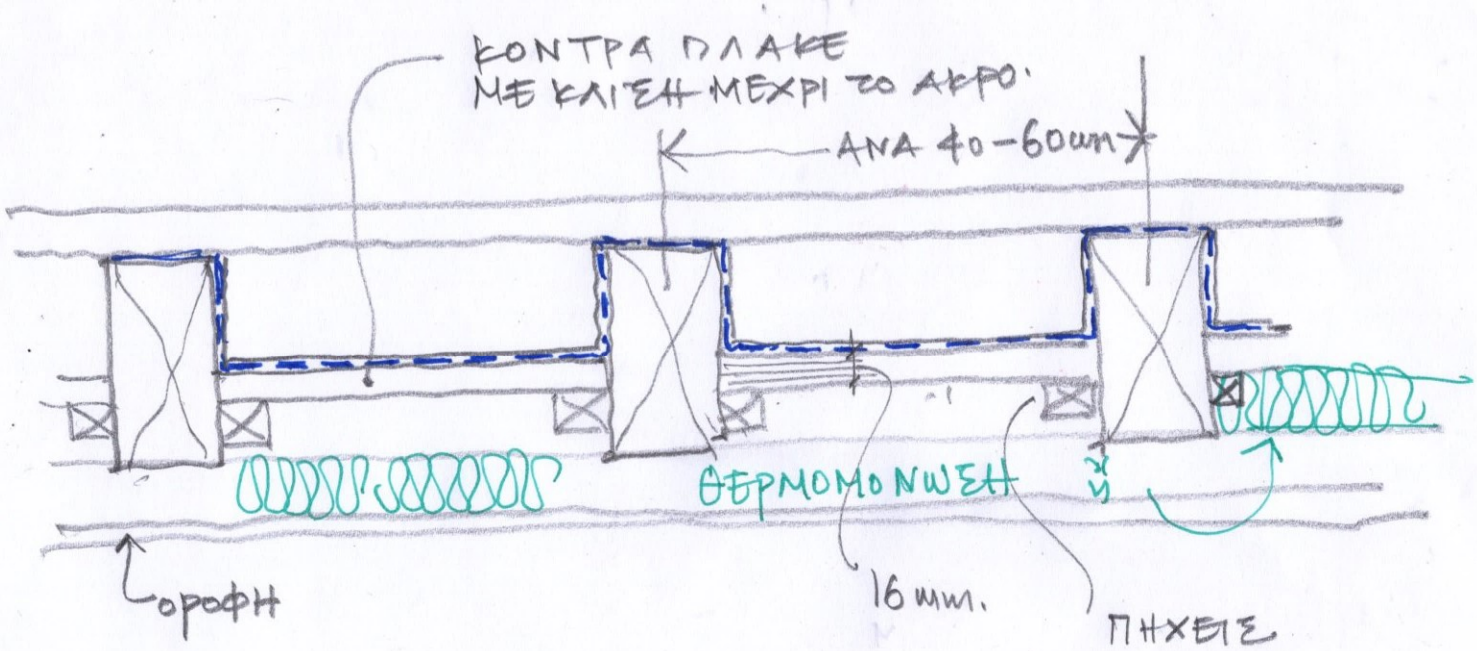


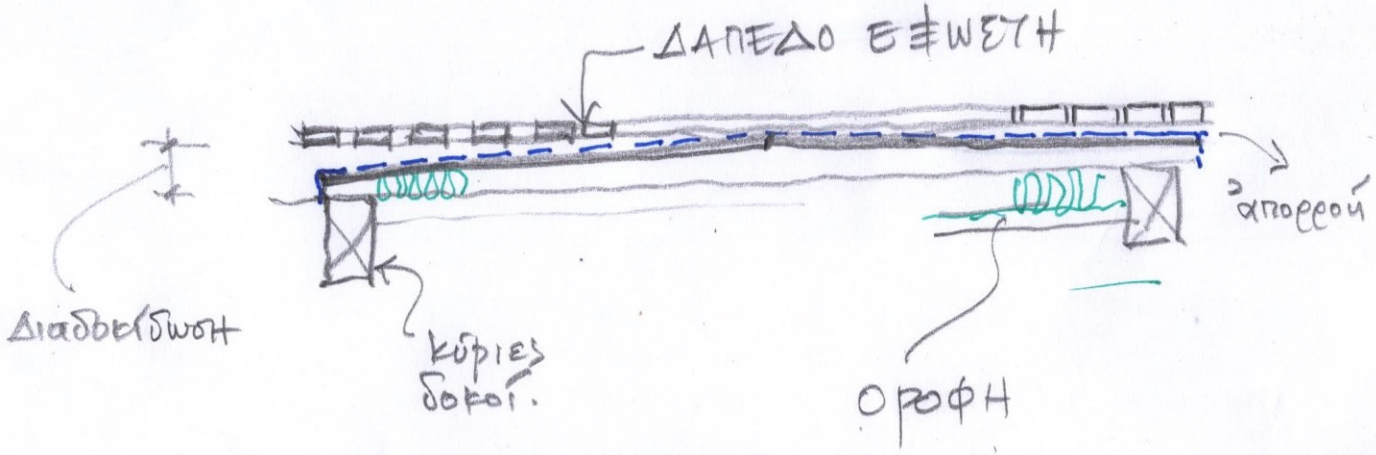
ΚΥΡΙΕΣ ΔΟΚΟΙ





ΙΝΟΧ
ΧΑΛΚΟΣ (Cu)





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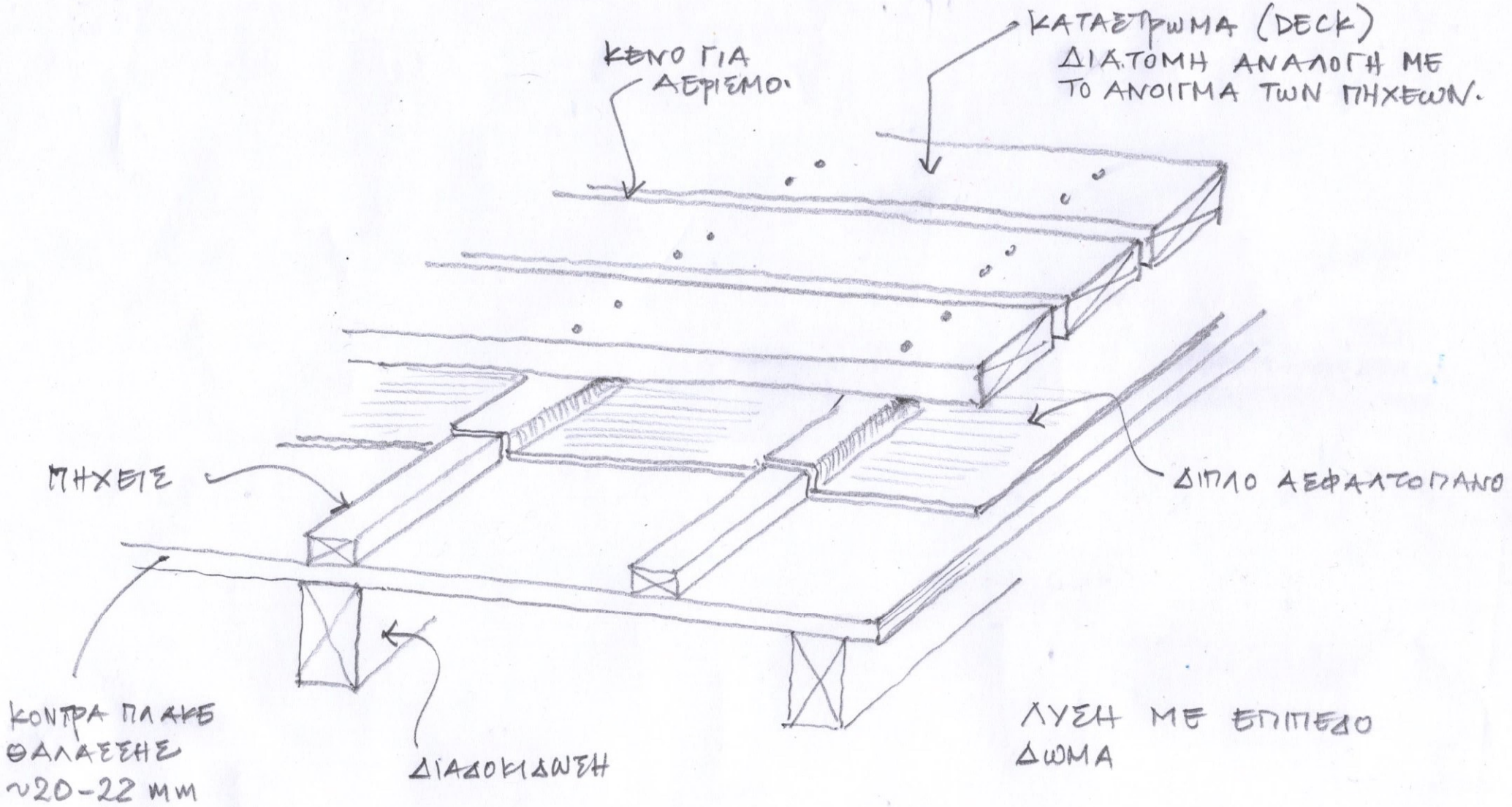
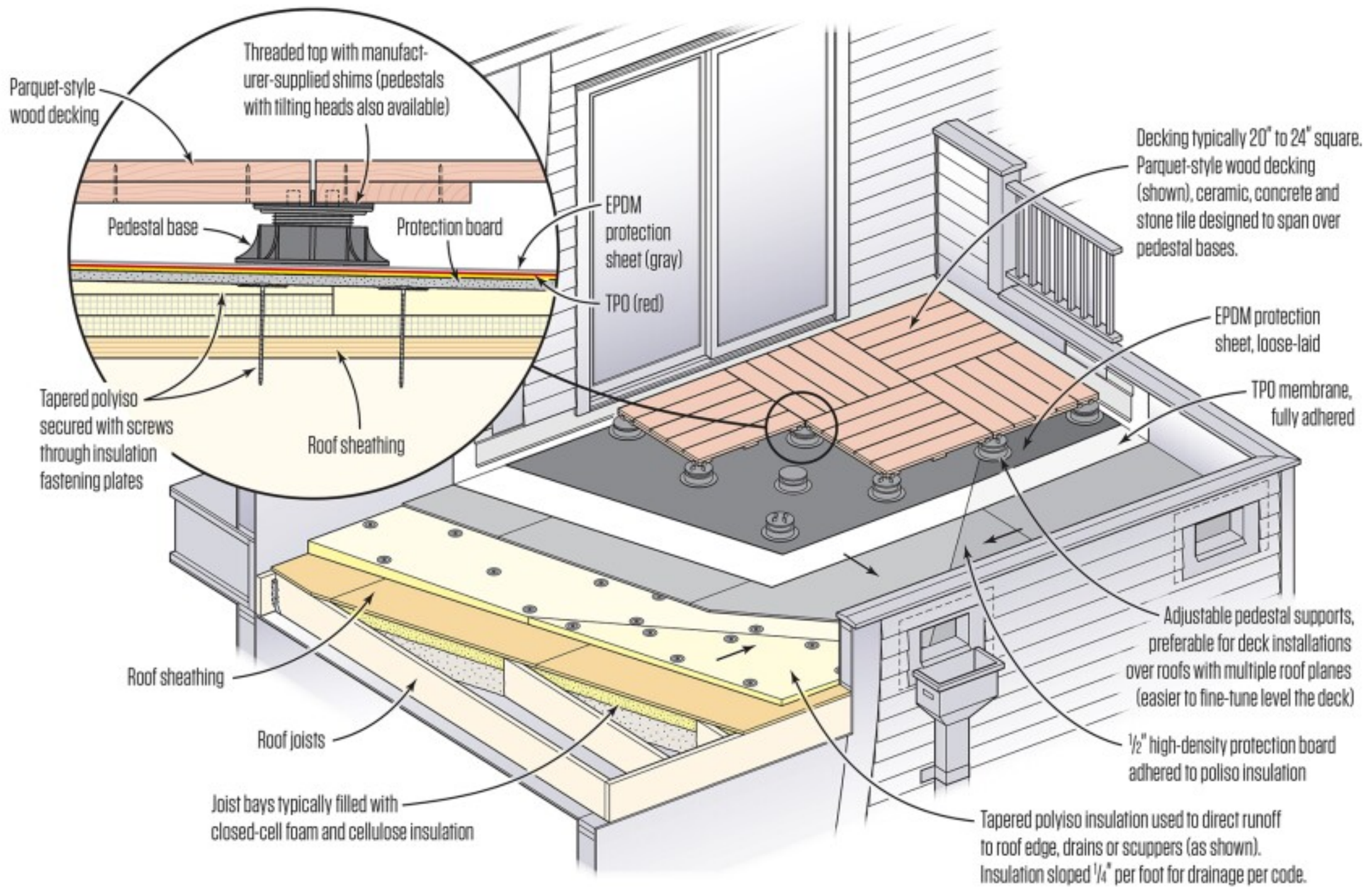
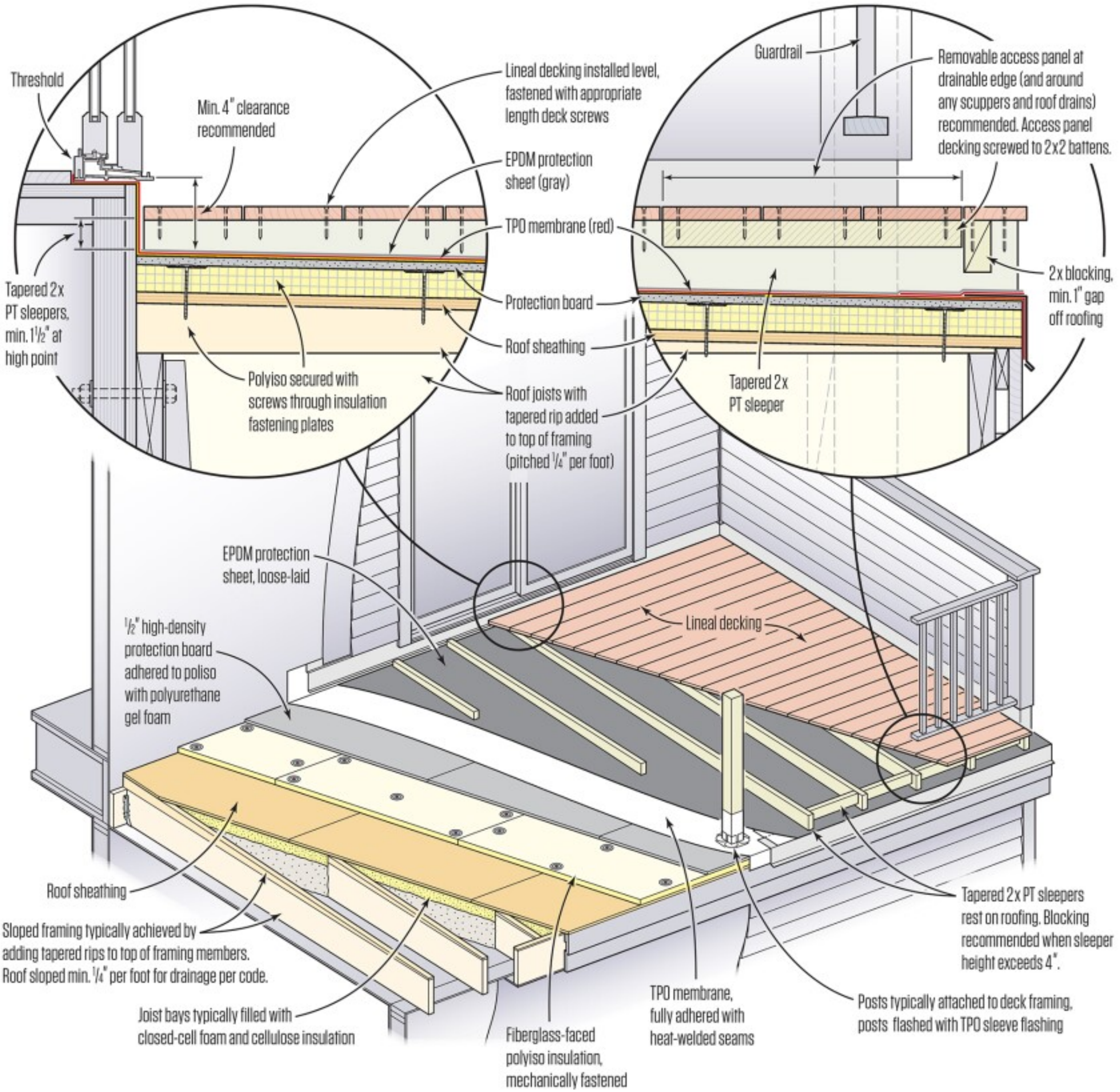

ΚΕΝΟ ΓΙΑ ΑΕΡΙΣΜΟ
ΚΑΤΑΣΤΡΩΜΑ (DECK)
ΔΙΑΤΟΜΗ ΑΝΑΛΟΓΗ ΜΕ ΤΟ ΑΝΟΙΓΜΑ ΤΩΝ ΠΗΧΕΩΝ.
ΠΗΧΕΙΣ
ΔΙΠΛΟ ΑΕΦΑΛΤΟΠΑΝΟ
ΚΟΝΤΡΑ ΠΛΑΚΕ ΘΑΛΑΣΣΗΣ ~20-22 mm
ΔΙΑΔΟΚΙΔΩΣΗ
ΛΥΣΗ ΜΕ ΕΠΙΠΕΔΟ ΔΩΜΑ


GRACE VYCOR DECK PROTECTOR
GRACE VYCOR DECK PROTECTOR
GRACE VYCOR DECK PROTECTOR

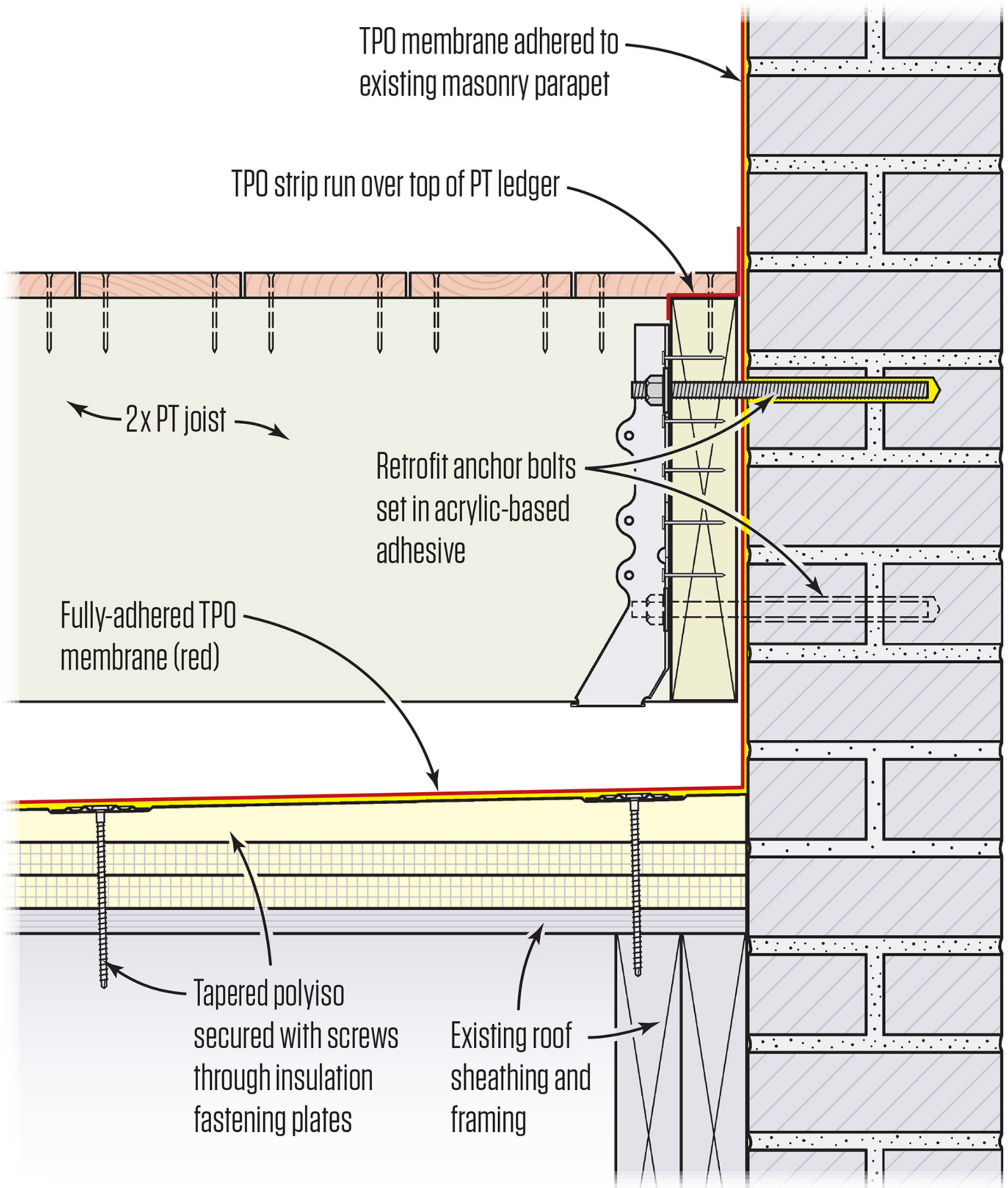
Tapered Insulation With Pedestal Supports

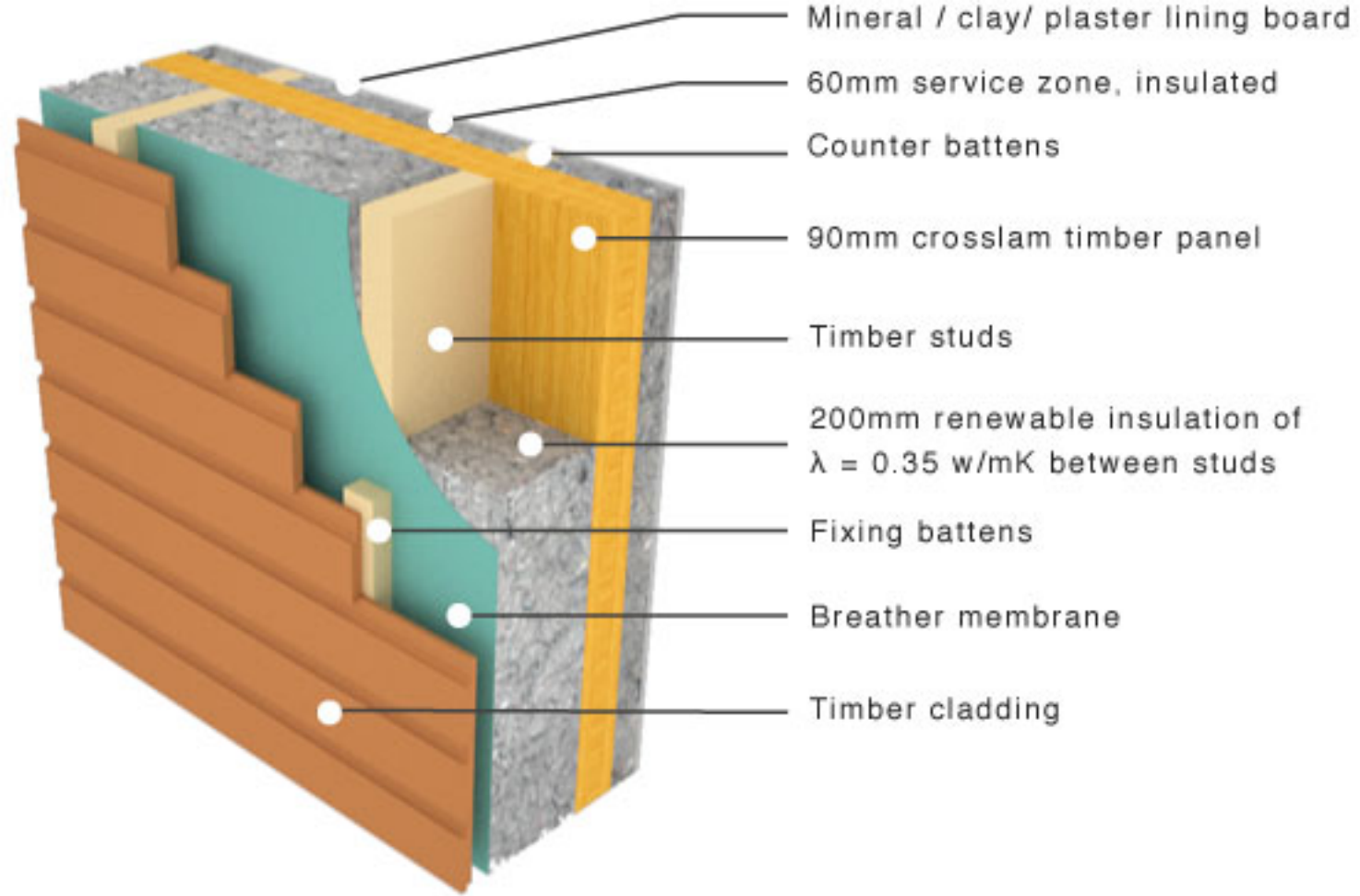


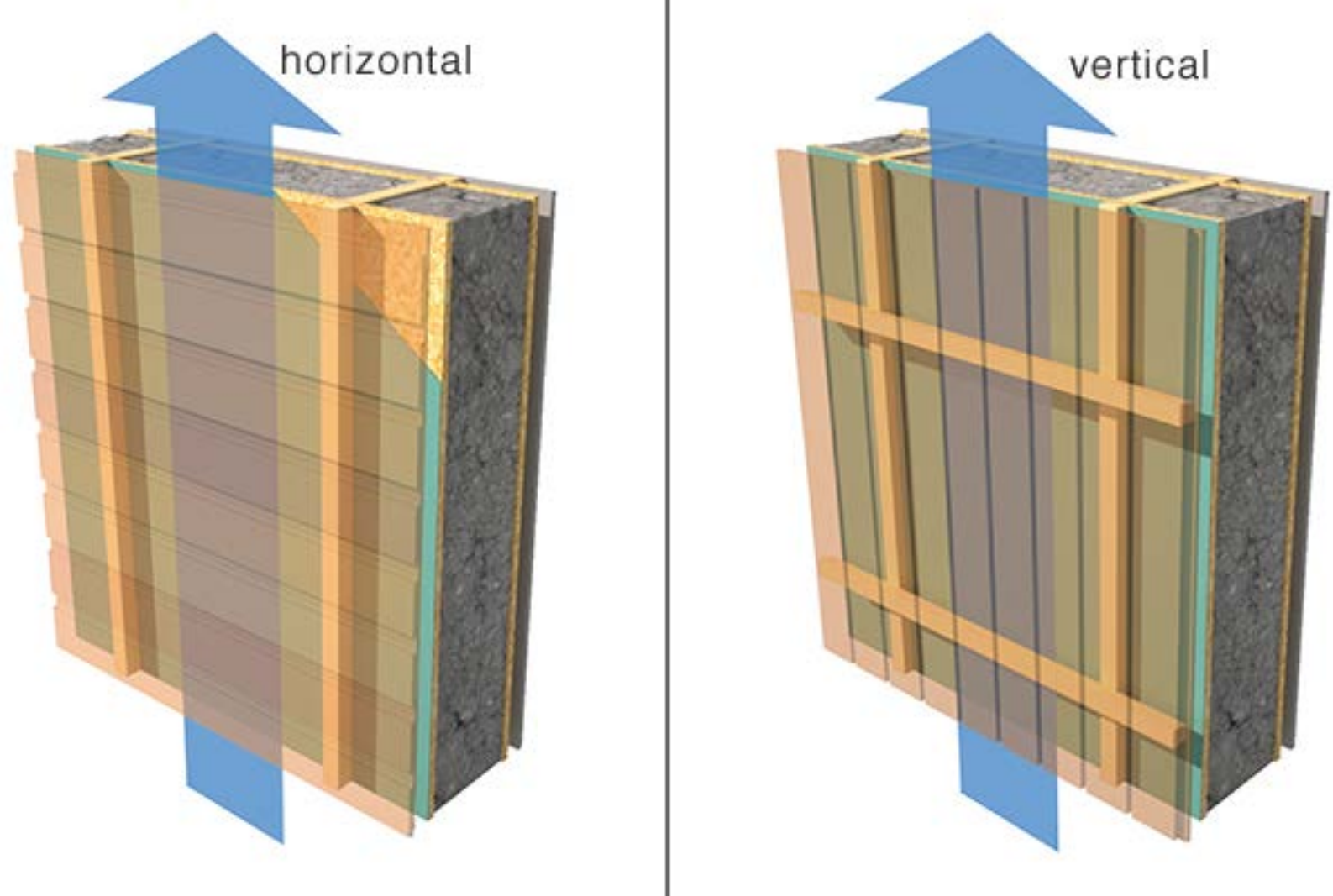
Sloped Framing With Tapered Sleepers

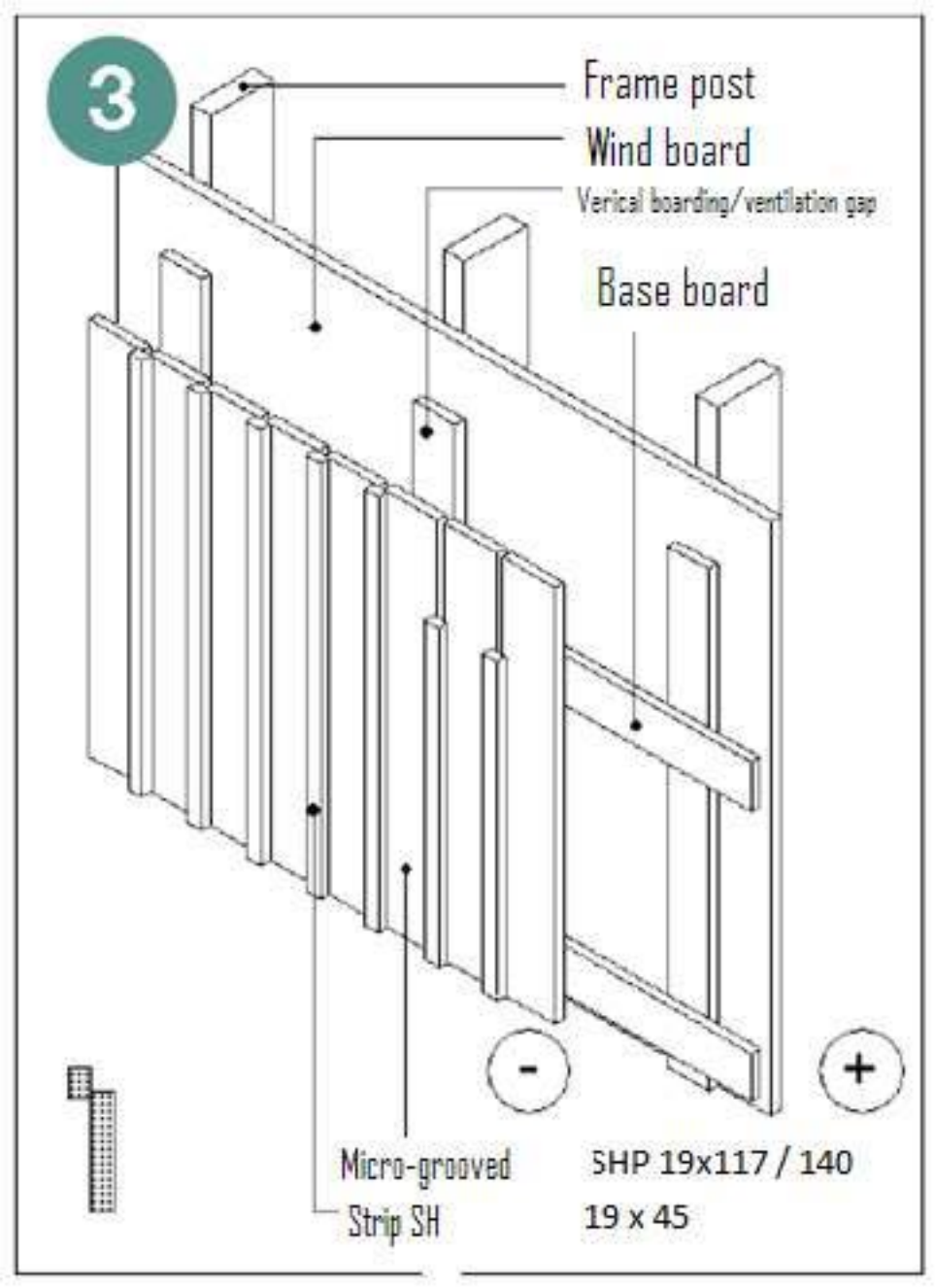


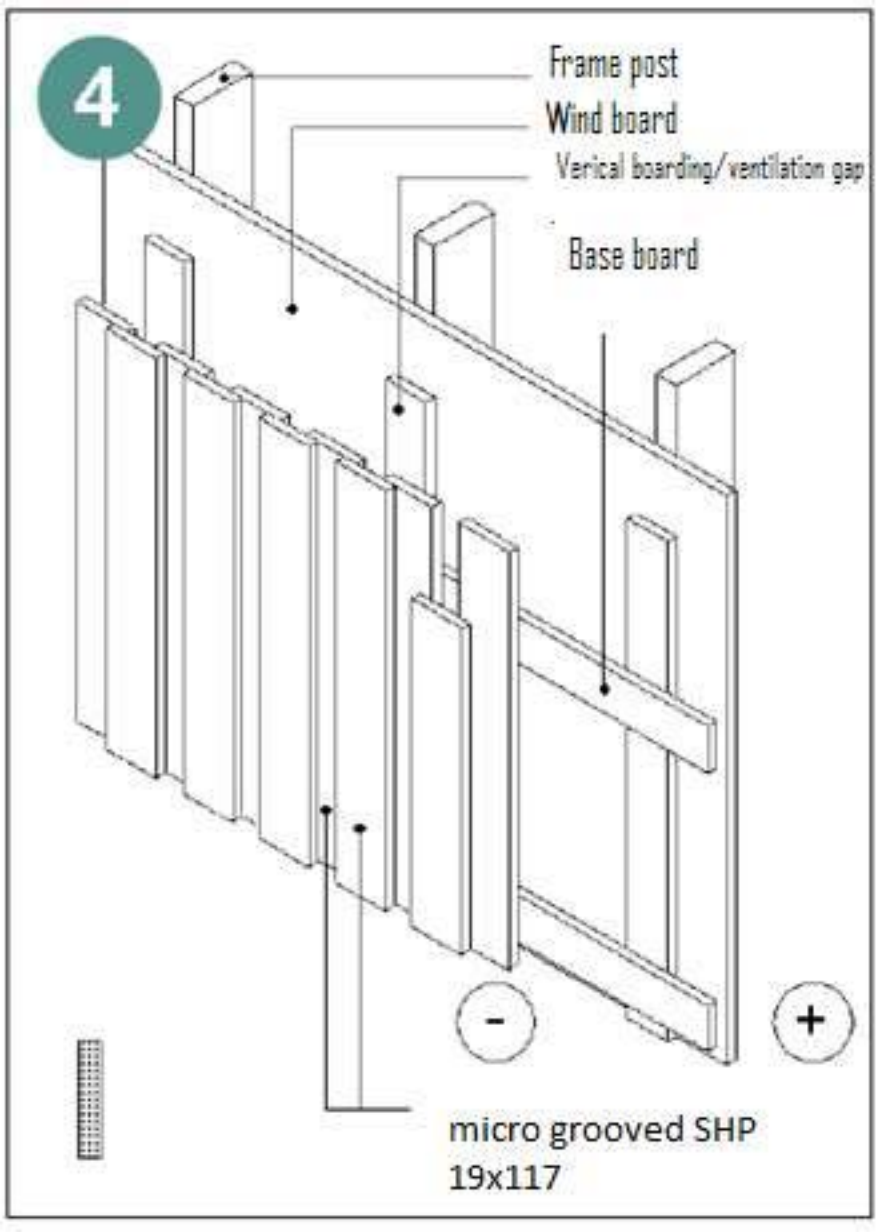
Suspended Deck Detail




Mineral / clay/ plaster lining board
60mm service zone, insulated
Counter battens
90mm crosslam timber panel
Timber studs
200mm renewable insulation of
λ = 0.35 w/mK between studs
Fixing battens
Breather membrane
Timber cladding


horizontal
vertical


3
Frame post
Wind board
Verical boarding/ventilation gap
Base board
-
+
Micro-grooved
Strip SH
SHP 19x117 / 140
19 x 45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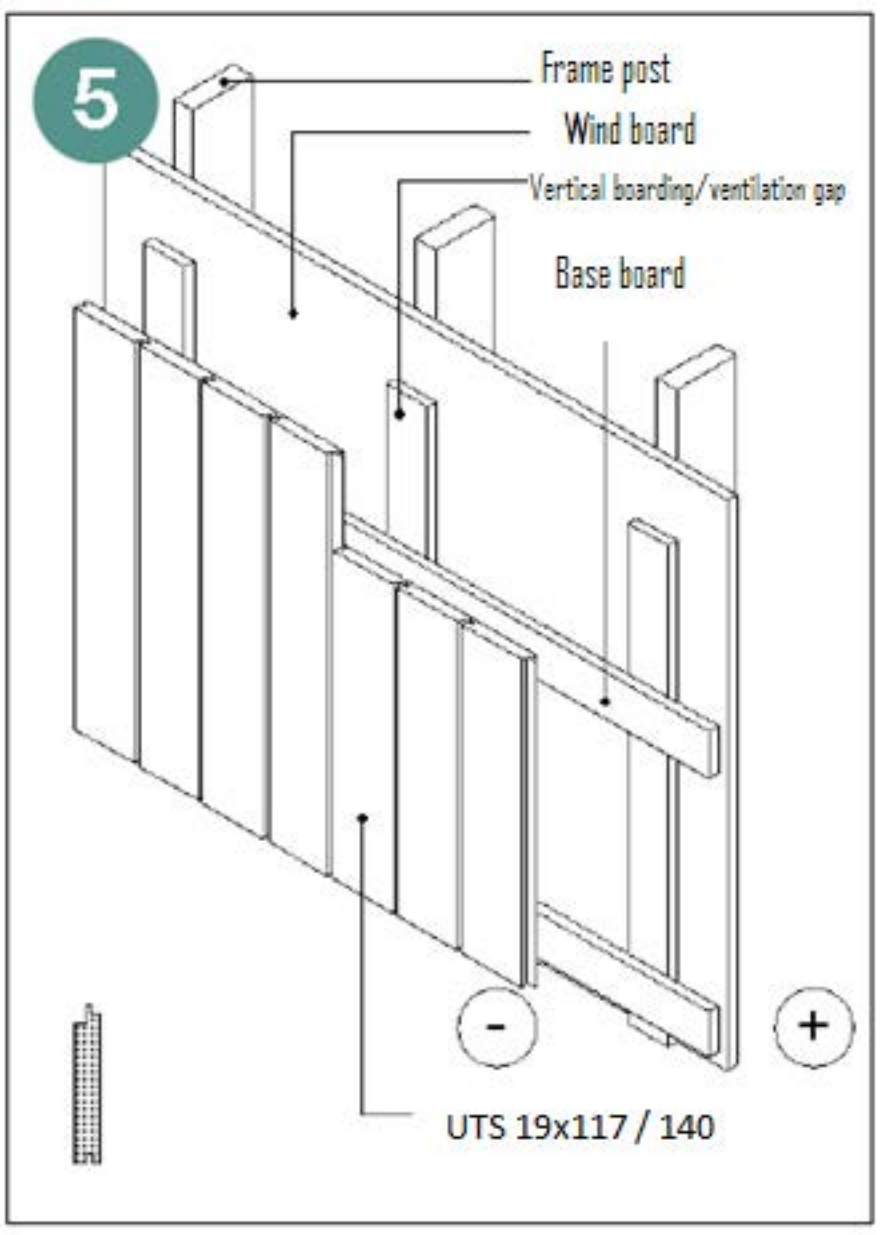
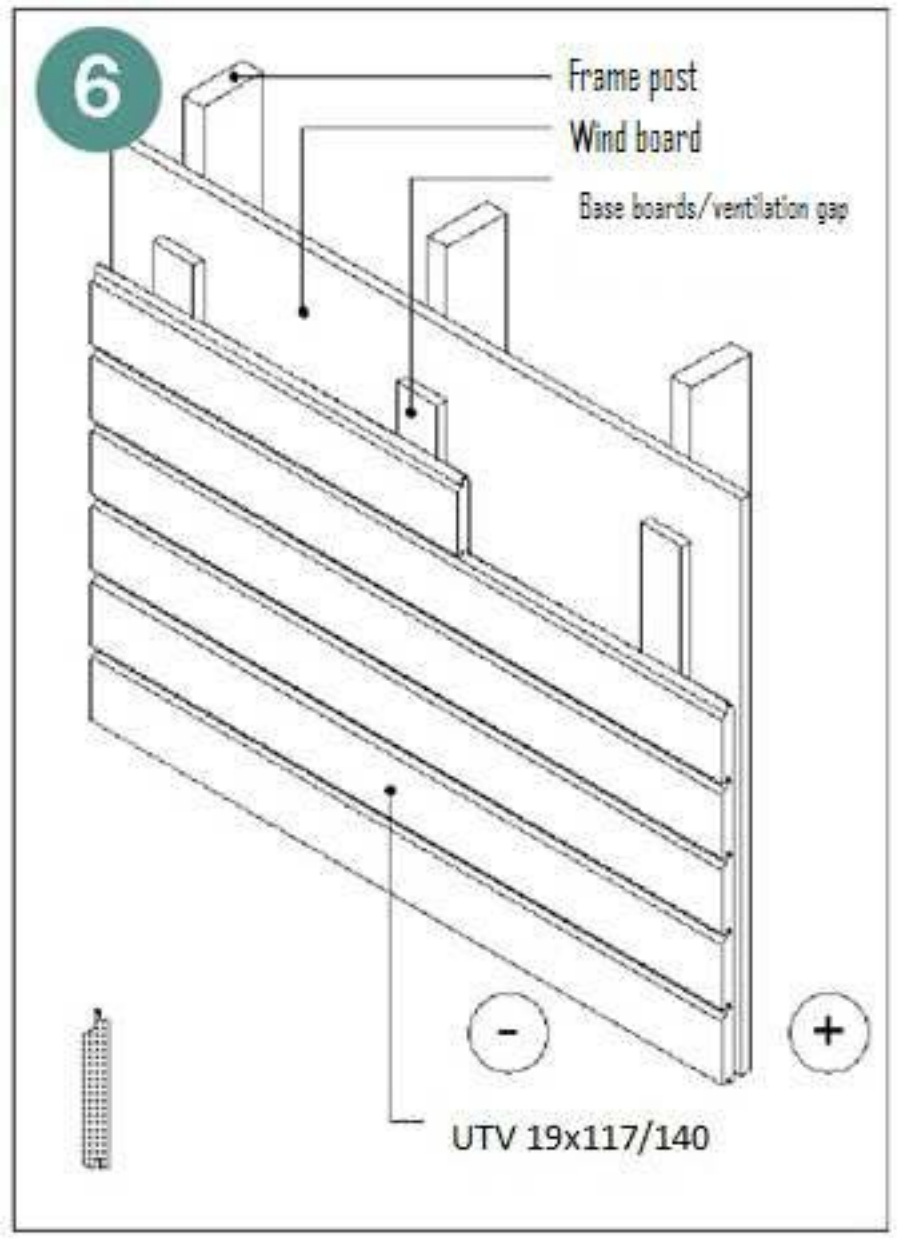
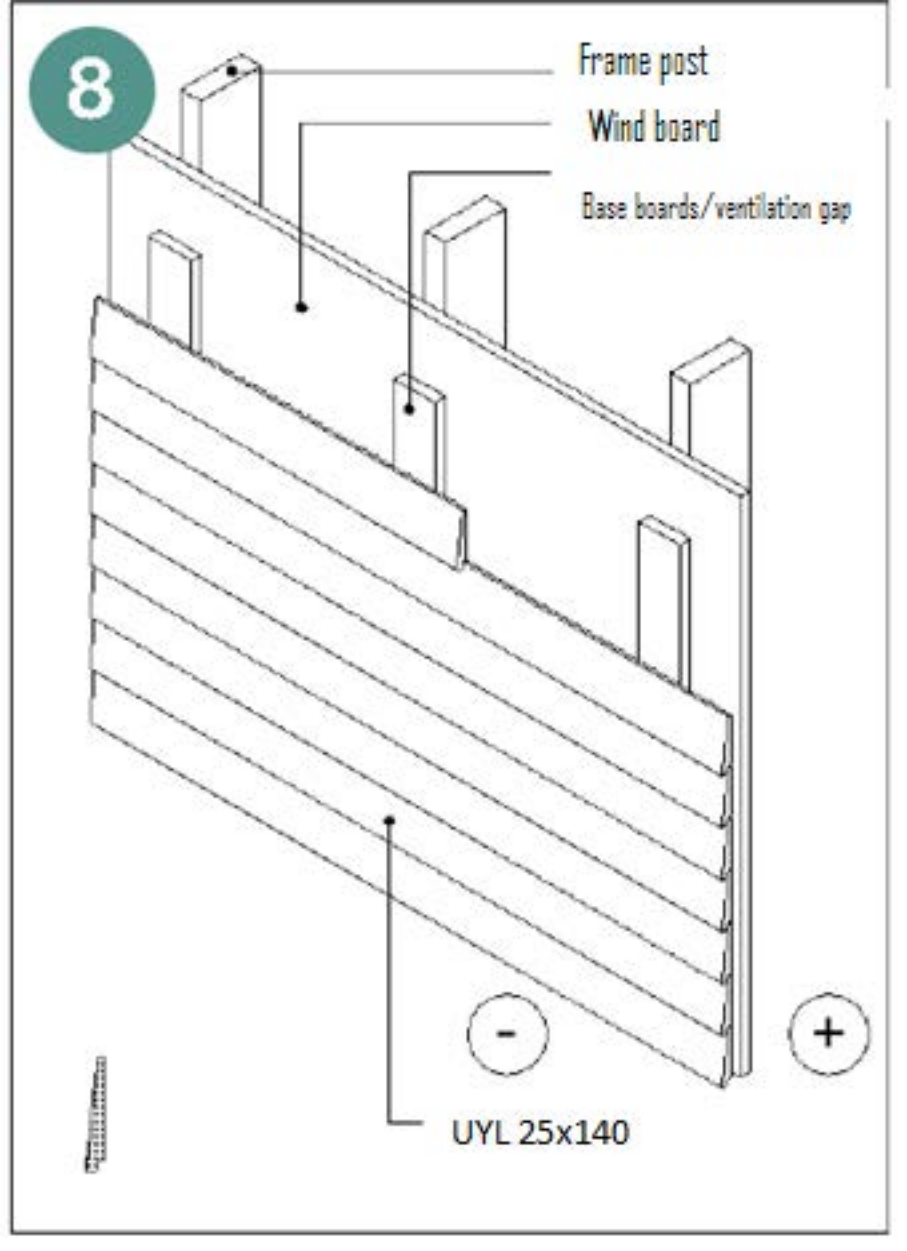
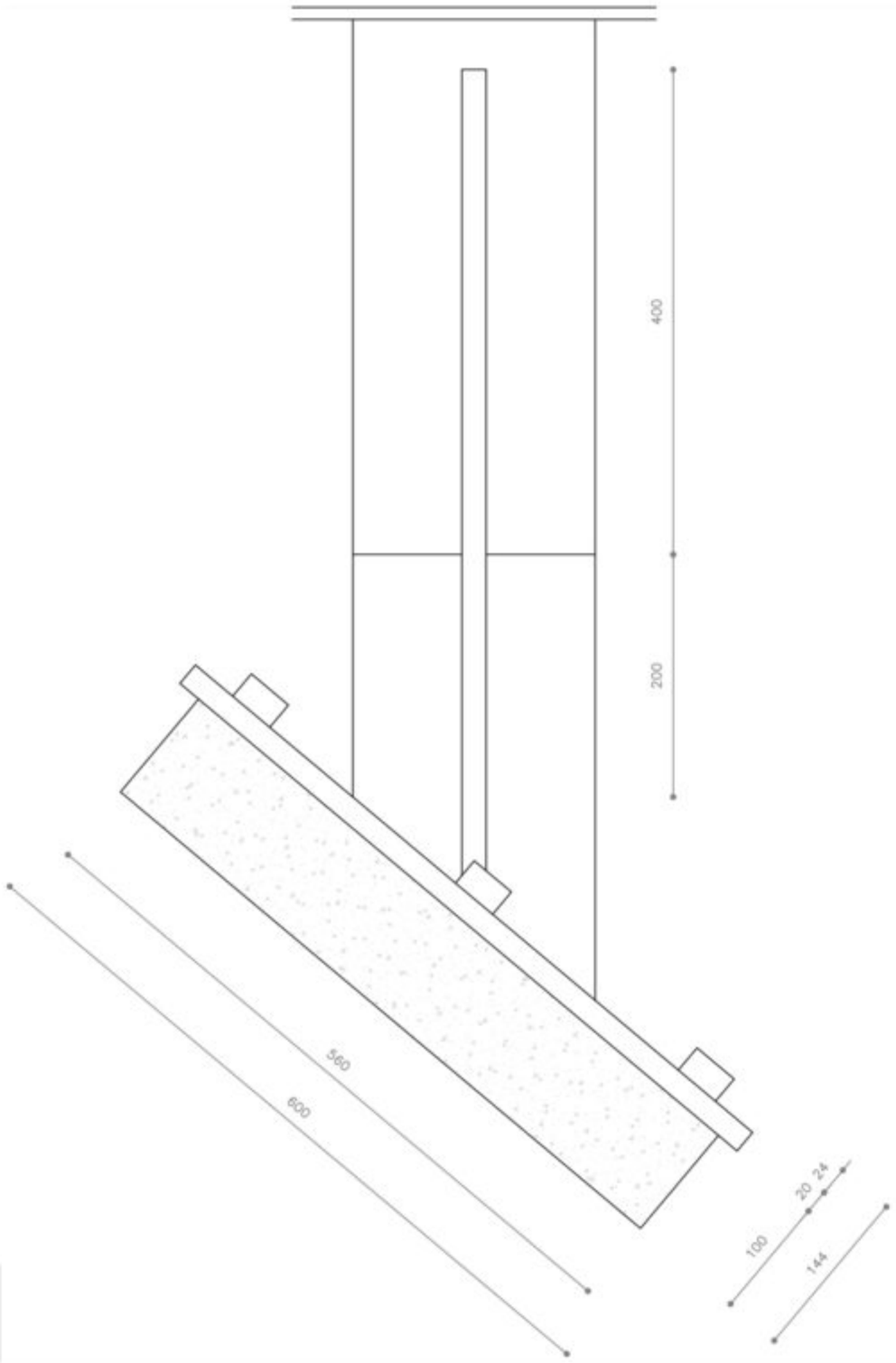
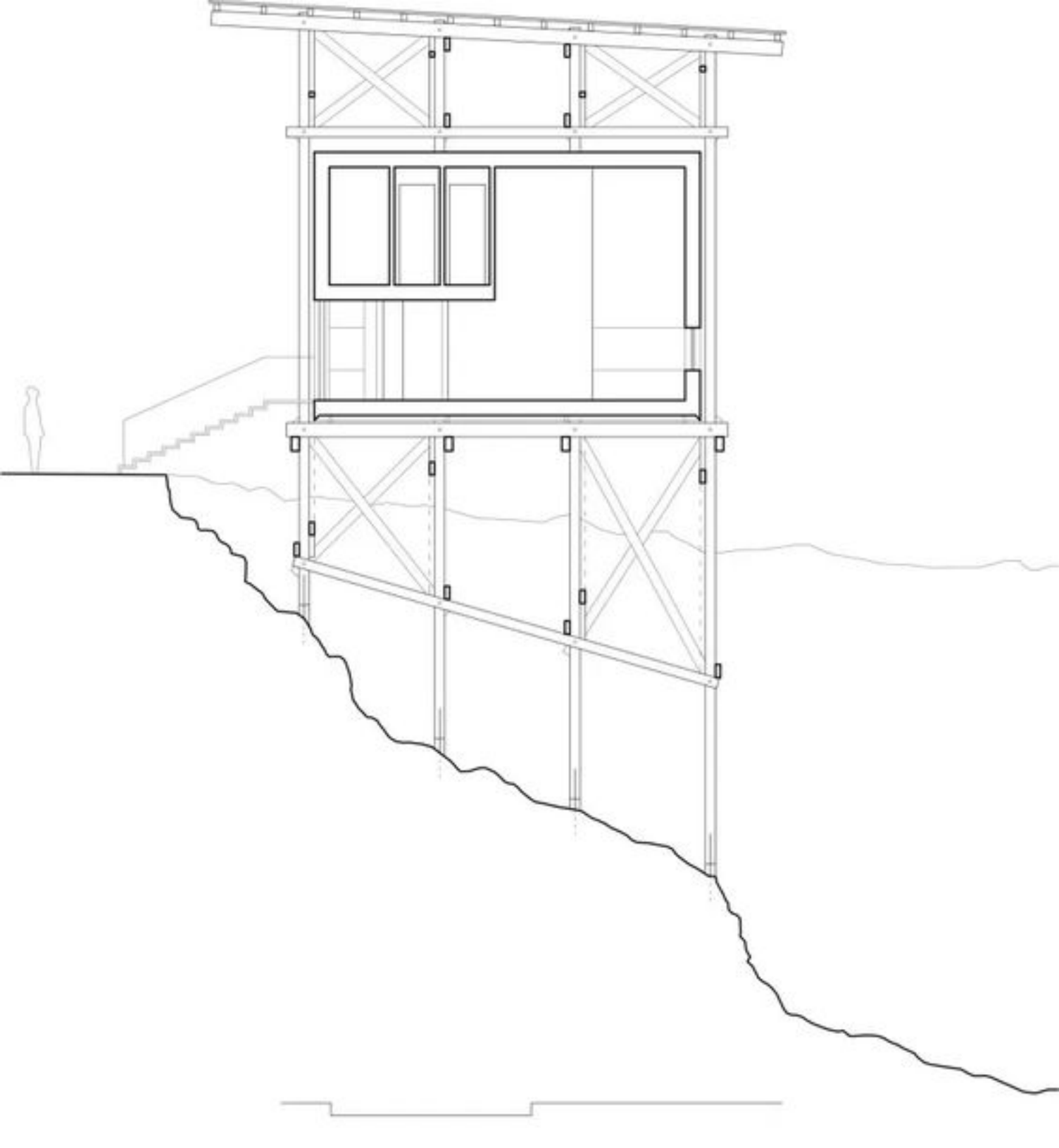
Frame post
Wind board
Verical boarding/ventilation gap
Base board
-
+
micro grooved SHP
19x117

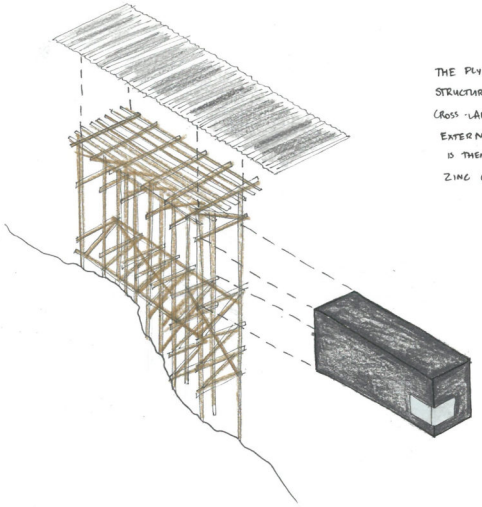

5
Frame post
Wind board
Vertical boarding/ventilation gap
Base board
-
+
UTS 19x117 / 140


6
Frame post
Wind board
Base boards/ventilation gap
-
+
UTV 19x117/140

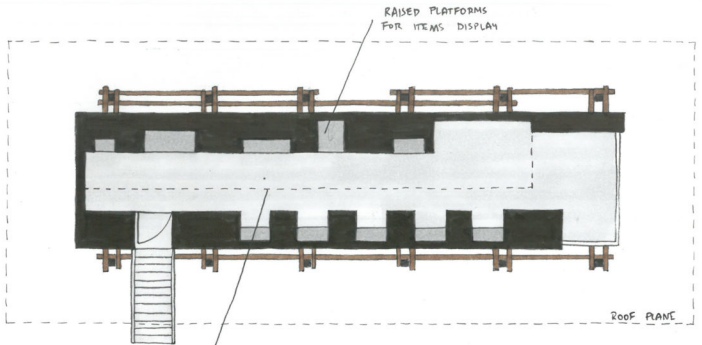

8
Frame post
Wind board
Base boards/ventilation gap
-
+
UYL 25x140

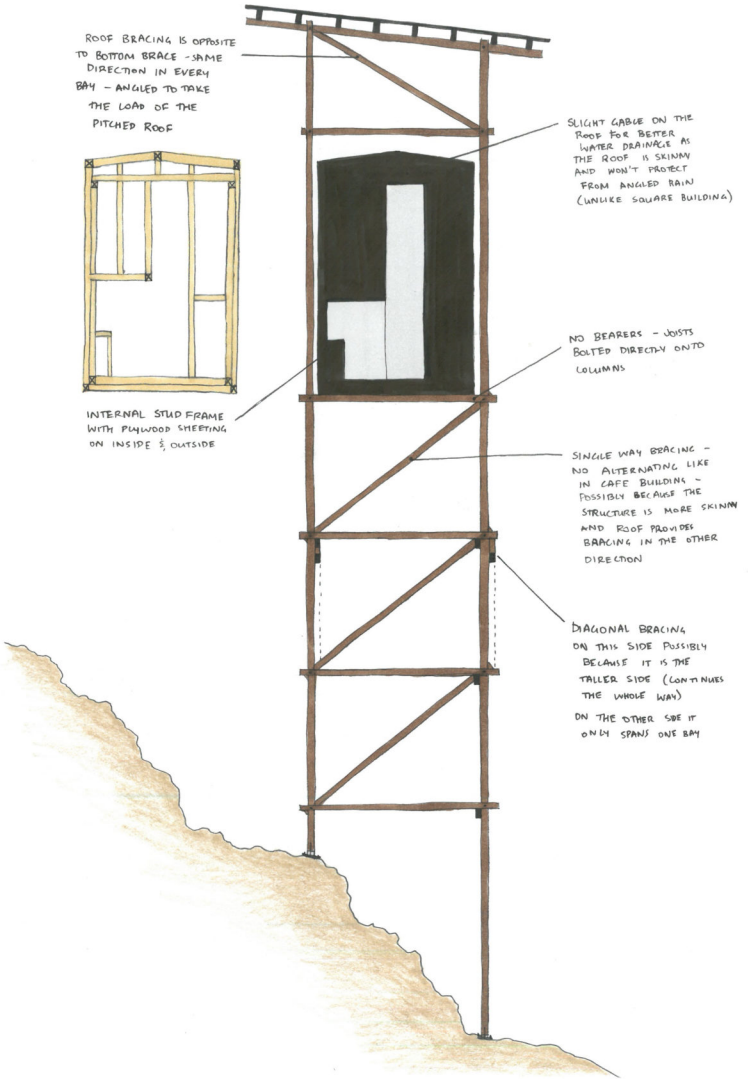

400
200
560
600
100
20
24
144





THE PLYWOOD INTERNAL STRUCTURE SLOTS INTO THE CROSS-LAMINATED TIMBER BEAM EXTERNAL STRUCTURE AND IS THEN TOPPED WITH A ZINC CORRUGATED ROOF





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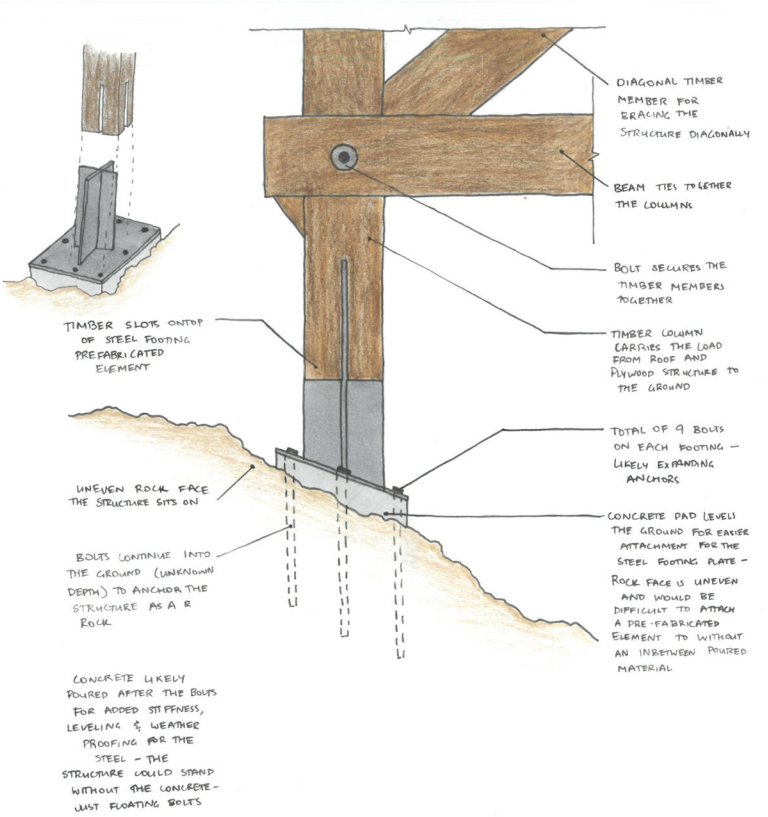
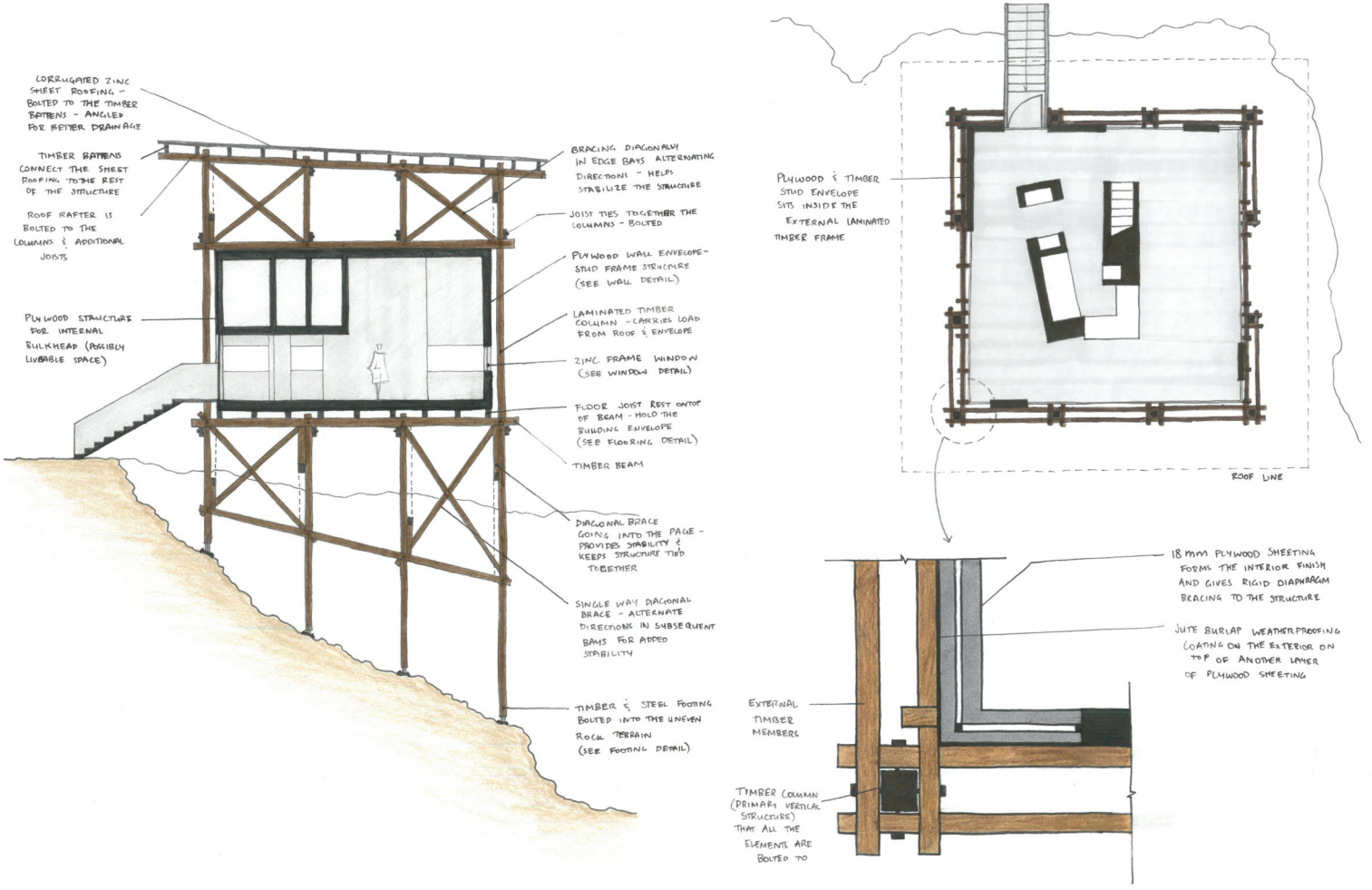

DIAGONAL TIMBER MEMBER FOR BRACING THE STRUCTURE DIAGONALLY
BEAM TIES TOGETHER THE COLUMNS
BOLT SECURES THE TIMBER MEMBERS TOGETHER
TIMBER COLUMN CARRIES THE LOAD FROM ROOF AND PLYWOOD STRUCTURE TO THE GROUND
TIMBER SLOTS ONTOP OF STEEL FOOTING PREFABRICATED ELEMENT
TOTAL OF 9 BOLTS ON EACH FOOTING – LIKELY EXPANDING ANCHORS
UNEVEN ROCK FACE THE STRUCTURE SITS ON
CONCRETE PAD LEVELS THE GROUND FOR EASIER ATTACHMENT FOR THE STEEL FOOTING PLATE –
BOLTS CONTINUE INTO THE GROUND (UNKNOWN DEPTH) TO ANCHOR THE STRUCTURE AS A R ROCK
ROCK FACE IS UNEVEN AND WOULD BE DIFFICULT TO ATTACH A PRE-FABRICATED ELEMENT TO WITHOUT AN INBETWEEN POURED MATERIAL
CONCRETE LIKELY POURED AFTER THE BOLTS FOR ADDED STIFFNESS, LEVELING & WEATHER PROOFING FOR THE STEEL – THE STRUCTURE COULD STAND WITHOUT THE CONCRETE – JUST FLOATING BOLTS


CORRUGATED ZINC SHEET ROOFING - BOLTED TO THE TIMBER BATTENS - ANGLED FOR BETTER DRAINAGE
TIMBER BATTENS CONNECT THE SHEET ROOFING TO THE REST OF THE STRUCTURE
ROOF RAFTER IS BOLTED TO THE COLUMNS & ADDITIONAL JOISTS
PLYWOOD STRUCTURE FOR INTERNAL BULKHEAD (POSSIBLY LIVEABLE SPACE)
BRACING DIAGONALLY IN EDGE BAYS ALTERNATING DIRECTIONS - HELPS STABILIZE THE STRUCTURE
JOIST TIES TOGETHER THE COLUMNS - BOLTED
PLYWOOD WALL ENVELOPE - STUD FRAME STRUCTURE (SEE WALL DETAIL)
LAMINATED TIMBER COLUMN - CARRIES LOAD FROM ROOF & ENVELOPE
ZINC FRAME WINDOW (SEE WINDOW DETAIL)
FLOOR JOIST REST ONTOP OF BEAM - HOLD THE BUILDING ENVELOPE (SEE FLOORING DETAIL)
TIMBER BEAM
DIAGONAL BRACE GOING INTO THE PAGE - PROVIDES STABILITY & KEEPS STRUCTURE TIED TOGETHER
SINGLE WAY DIAGONAL BRACE - ALTERNATE DIRECTIONS IN SUBSEQUENT BAYS FOR ADDED STABILITY
TIMBER & STEEL FOOTING BOLTED INTO THE UNEVEN ROCK TERRAIN (SEE FOOTING DETAIL)
PLYWOOD & TIMBER STUD ENVELOPE SITS INSIDE THE EXTERNAL LAMINATED TIMBER FRAME
ROOF LINE
18 mm PLYWOOD SHEETING FORMS THE INTERIOR FINISH AND GIVES RIGID DIAPHRAGM BRACING TO THE STRUCTURE
JUTE BURLAP WEATHERPROOFING COATING ON THE EXTERIOR ON TOP OF ANOTHER LAYER OF PLYWOOD SHEETING
EXTERNAL TIMBER MEMBERS
TIMBER COLUMN (PRIMARY VERTICAL STRUCTURE) THAT ALL THE ELEMENTS ARE BOLTED TO

24

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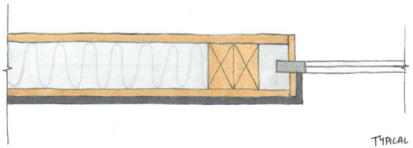
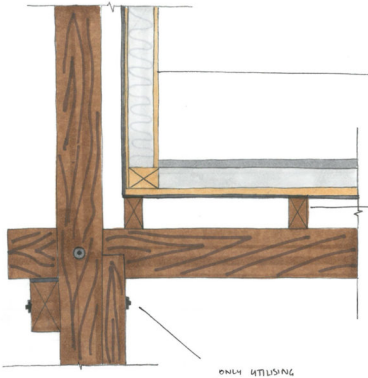


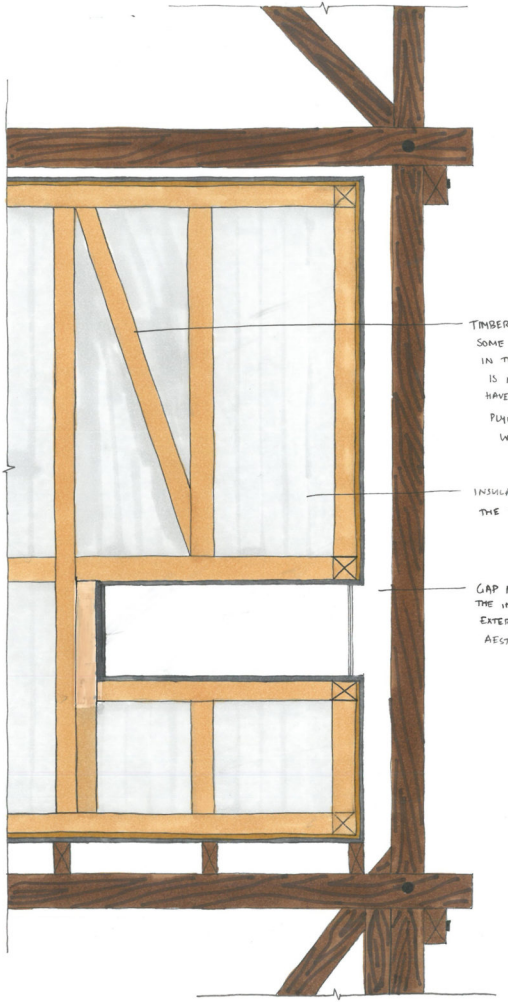
TYPICAL WINDOW DETAIL IN A TIMBER FRAME



INTERNAL STRUCTURE IS MADE OF PLYWOOD SHEETING AND TIMBER STUD FRAME WITH INSULATION INSERTED

JOISTS REST ON TOP OF BEARERS THAT THE INSERTED PLYWOOD STRUCTURE SITS ON

ONLY UTILISING BOLTED CONNECTIONS FOR THE OUTSIDE STRUCTURE DUE TO THE STAGGERED ALIGNMENT OF MEMBERS



TIMBER FRAME WITH SOME DIAGONAL BRACING IN THE BAYS - IS IT NECESSARY TO HAVE THIS WITH THE PLYWOOD SHEETING AS WELL?

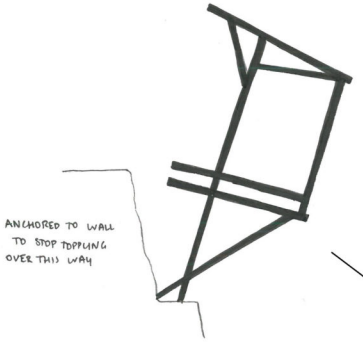
INSULATION IS INBETWEEN THE TIMBER FRAME

GAP MAINTAINED BETWEEN THE INTERNAL AND EXTERNAL STRUCTURE - AESTHETIC OF FLOATING

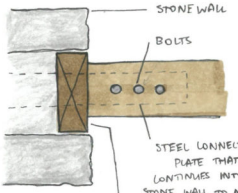
27

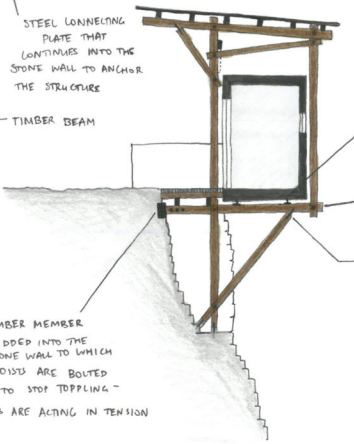
28

29



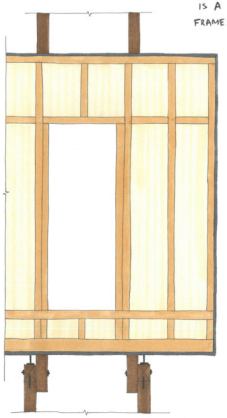
ANCHORED TO WALL TO STOP TOPPLING OVER THIS WAY





TIMBER MEMBER EMBEDDED INTO THE STONE WALL TO WHICH THE JOISTS ARE BOLTED TO TO STOP TOPPLING - JOISTS ARE ACTING IN TENSION

STRIPPED FRONT ELEVATION OF BATHROOM BLOCK - IS A TRADITIONAL STUD FRAME BUILDING STRUCTURE



NOT AS MUCH EXTERNAL FRAMING ON THIS STRUCTURE AS THE TWO OTHER BUILDINGS - THIS IS FOCUSED ON ANCHORING INTO THE WALL