



UNITIZED MEMBRANE ENVELOPE

FOR HIGH-RISE BUILDINGS IN
TROPICAL CLIMATES

MITCHELL EVERTS
4415531

UNITIZED MEMBRANE ENVELOPE

FOR HIGH-RISE BUILDINGS IN TROPICAL CLIMATES

MASTER THESIS, P5 REPORT

STUDENT: MITCHELL EVERTS
STUDENT NUMBER: 4415531

MEMBERS OF THE GRADUATION COMMITTEE:
FIRST MENTOR: PROF. DR. ING. ULRICH KNAACK
SECOND MENTOR: DR. REGINA BOKEL
DELEGATE EXAMINER: DR. IR. KLASKE HAVIK

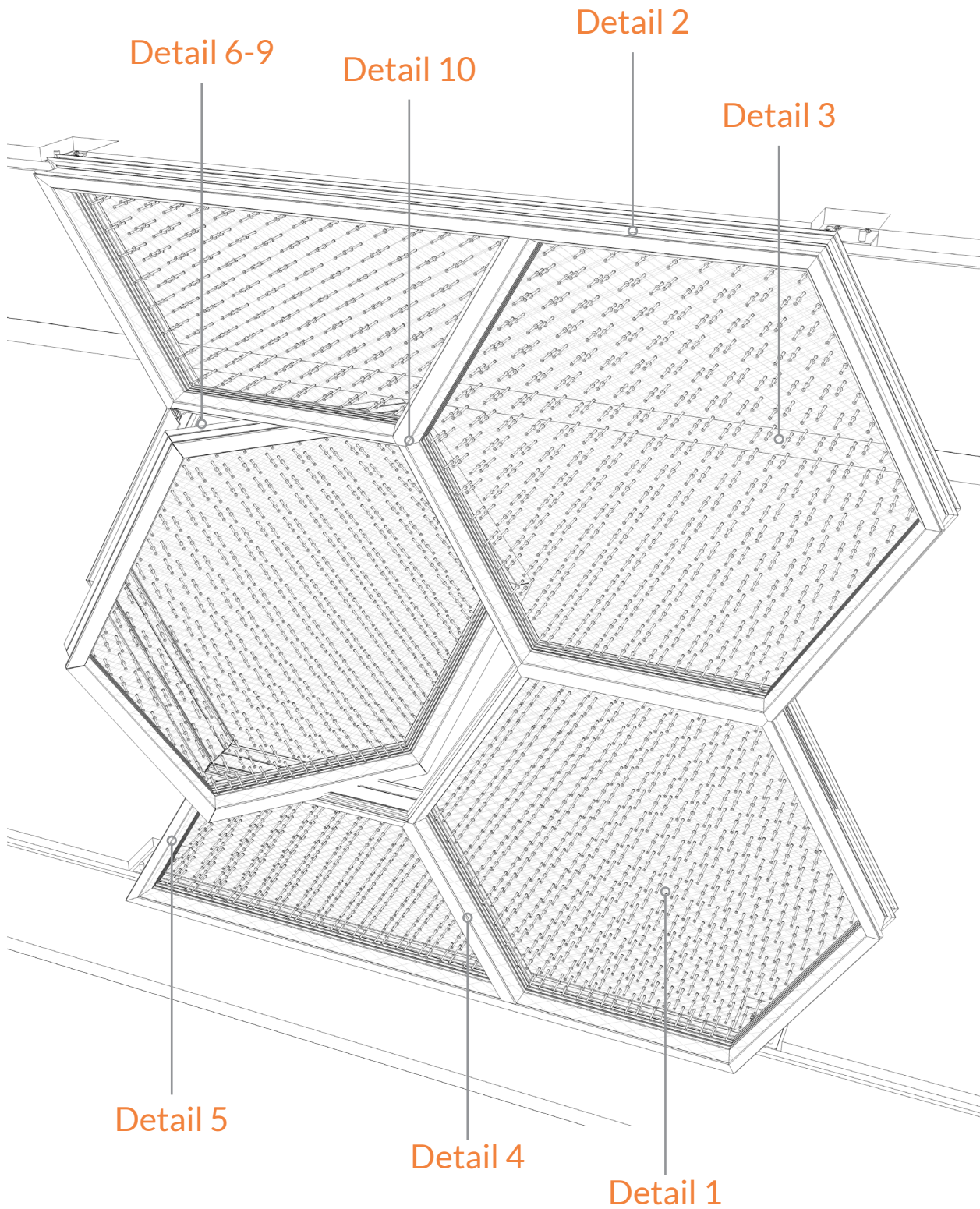
DELFT UNIVERSITY OF TECHNOLOGY
FACULTY OF ARCHITECTURE AND THE BUILT ENVIRONMENT
MSC ARCHITECTURE, URBANISM AND BUILDING SCIENCES
MASTER TRACK OF BUILDING TECHNOLOGY

DATE: 02-07-17

10.10 - Construction details

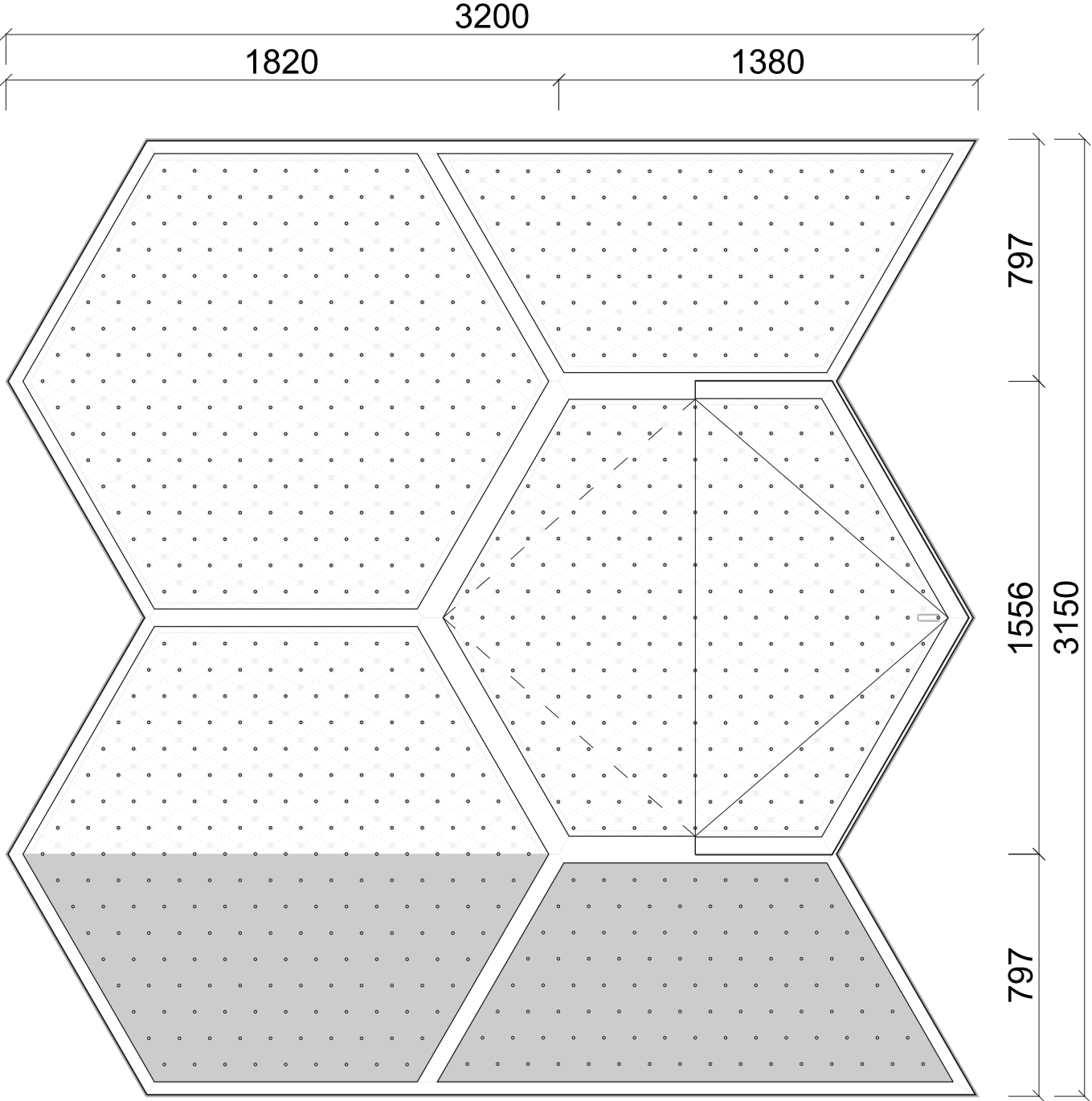
The following pages contain technical drawings of the unitized membrane envelope.

The drawings shown are facade views, sections and the details indicated below



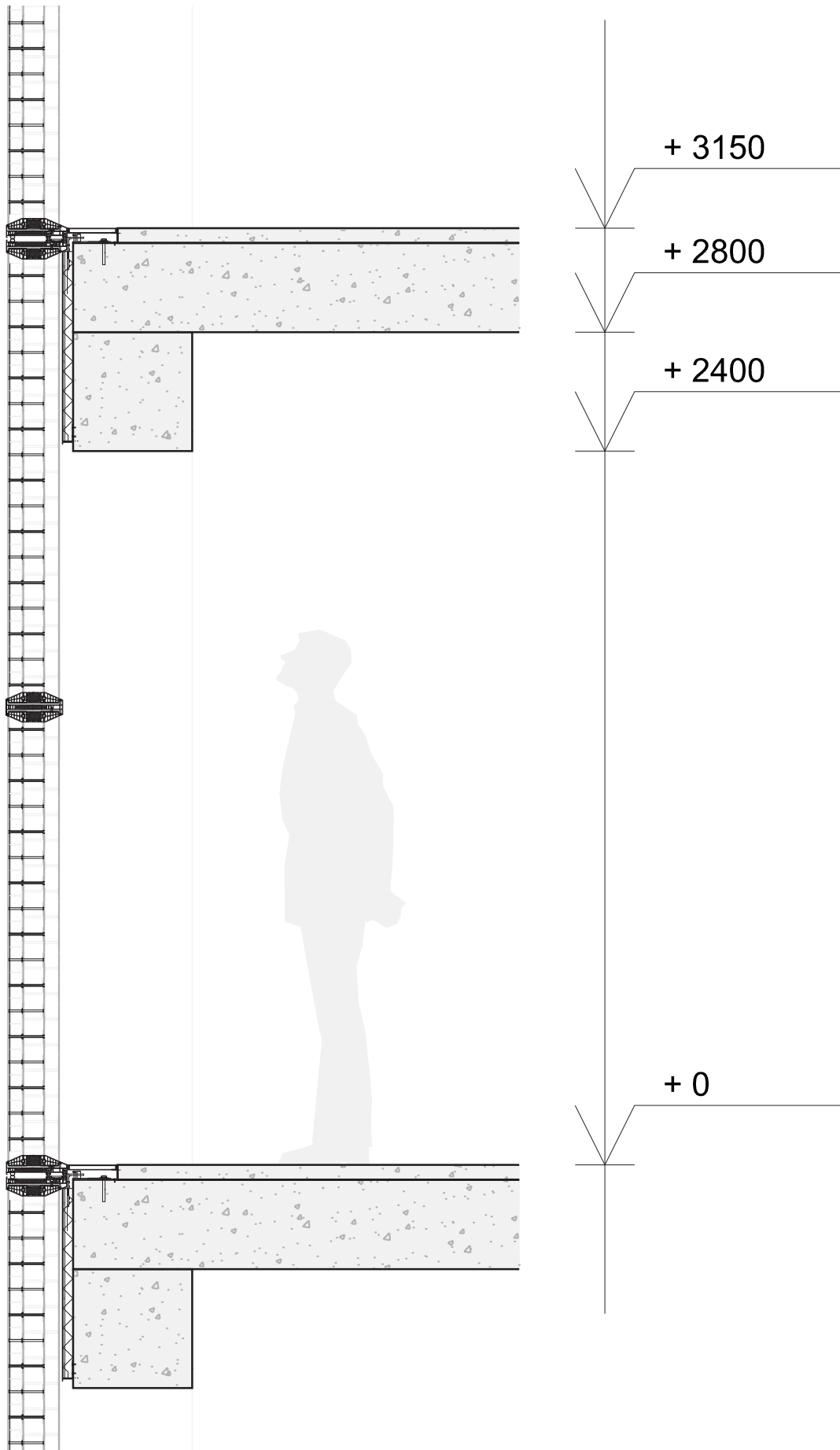
Front view

1:20



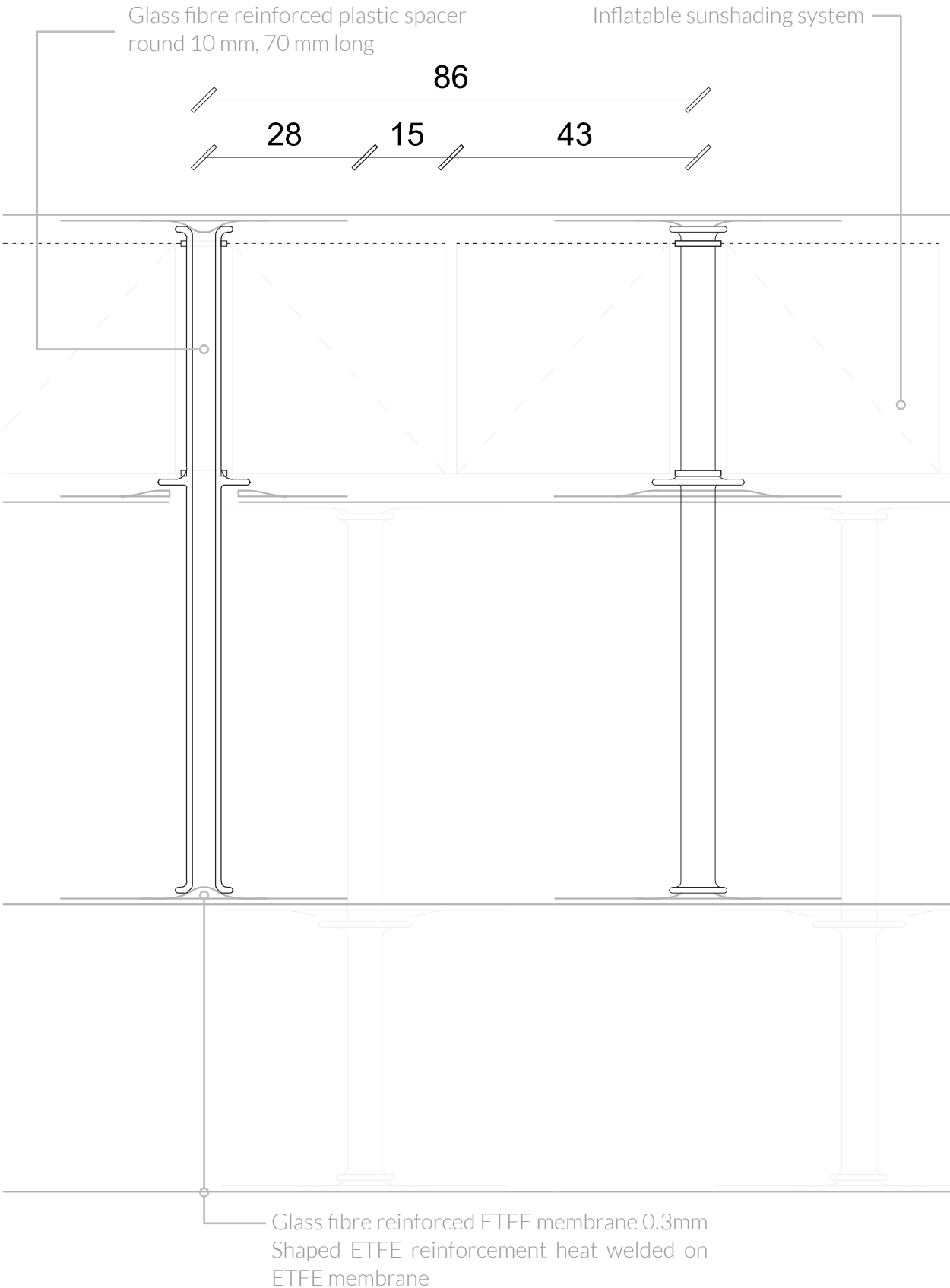
Section

1:20



Detail 1

Membranes and spacers - vertical - 1:1



Detail 2

Unit to floor connection - vertical - 1:2

- A Glass fibre reinforced plastic window frame 170x36 mm
Insulated thermal break 46x35 mm
Keder clamp
Perforation for air evacuation
Pneumatic sun shading air tube
Anti-slip rubber strip

- B Glass fibre reinforced plastic unit frame 205x43 mm
Insulated thermal break 102x16 mm
Ribbed vacuum tube
Weather and window clamp seal
Window seal
Glass fibre reinforced plastic window clamp click profile

- C Expanding gasket
Sliding air gasket

- D Glass fibre reinforced plastic spacer round 10 mm, 70 mm long

- E Glass fibre reinforced ETFE membrane 0.3mm
Shaped ETFE reinforcement heat welded on ETFE membrane

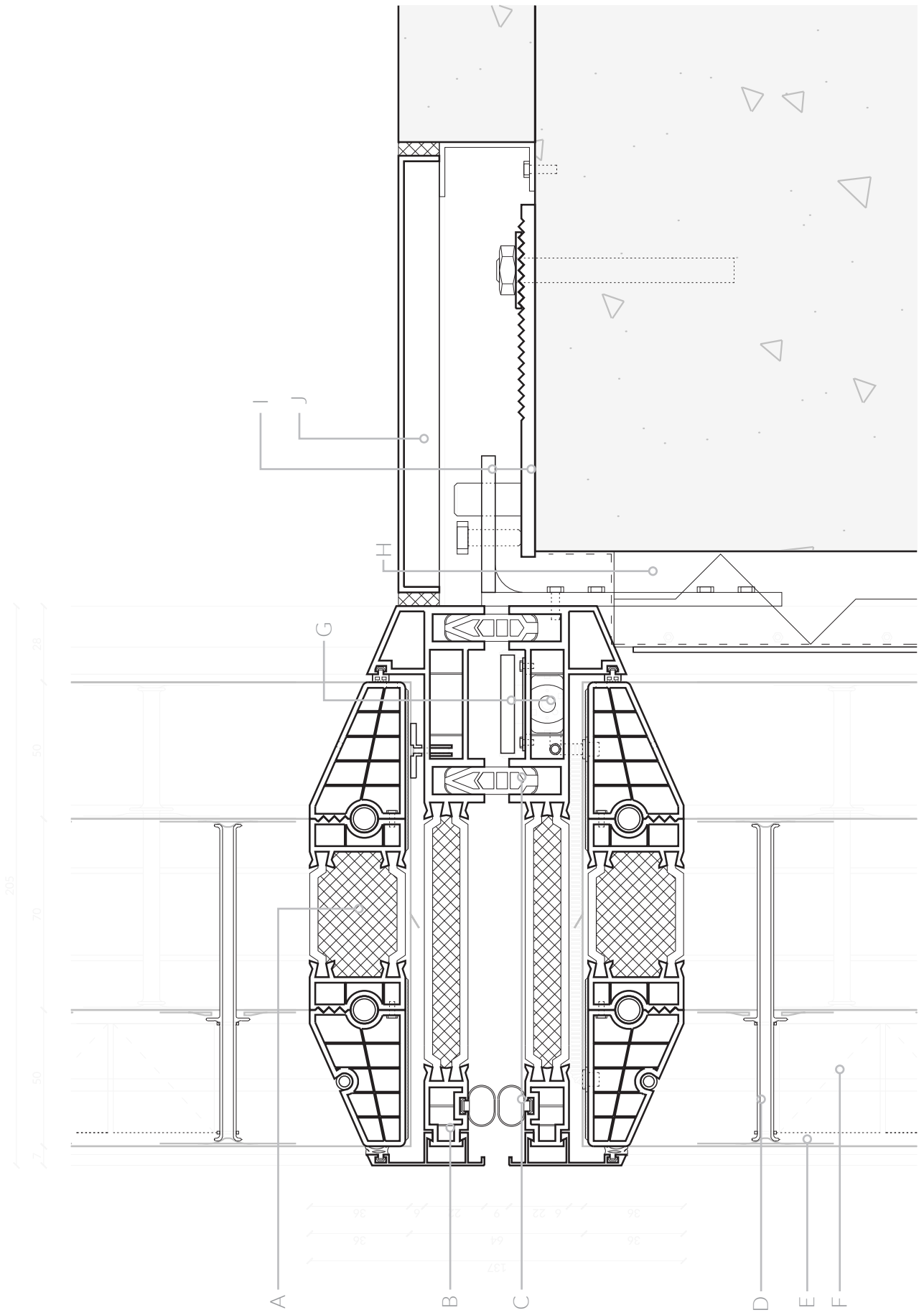
- F Inflatable sunshading system

- G Adjustable foot for setting window frame
Hoist plate on hinge folded in, bolted to frame
Vacuum pump 12V 20x12x80 mm
Ribbed vacuum tube

- H Mineral wool insulation
Glass fibre reinforced plastic plate bolted to frame

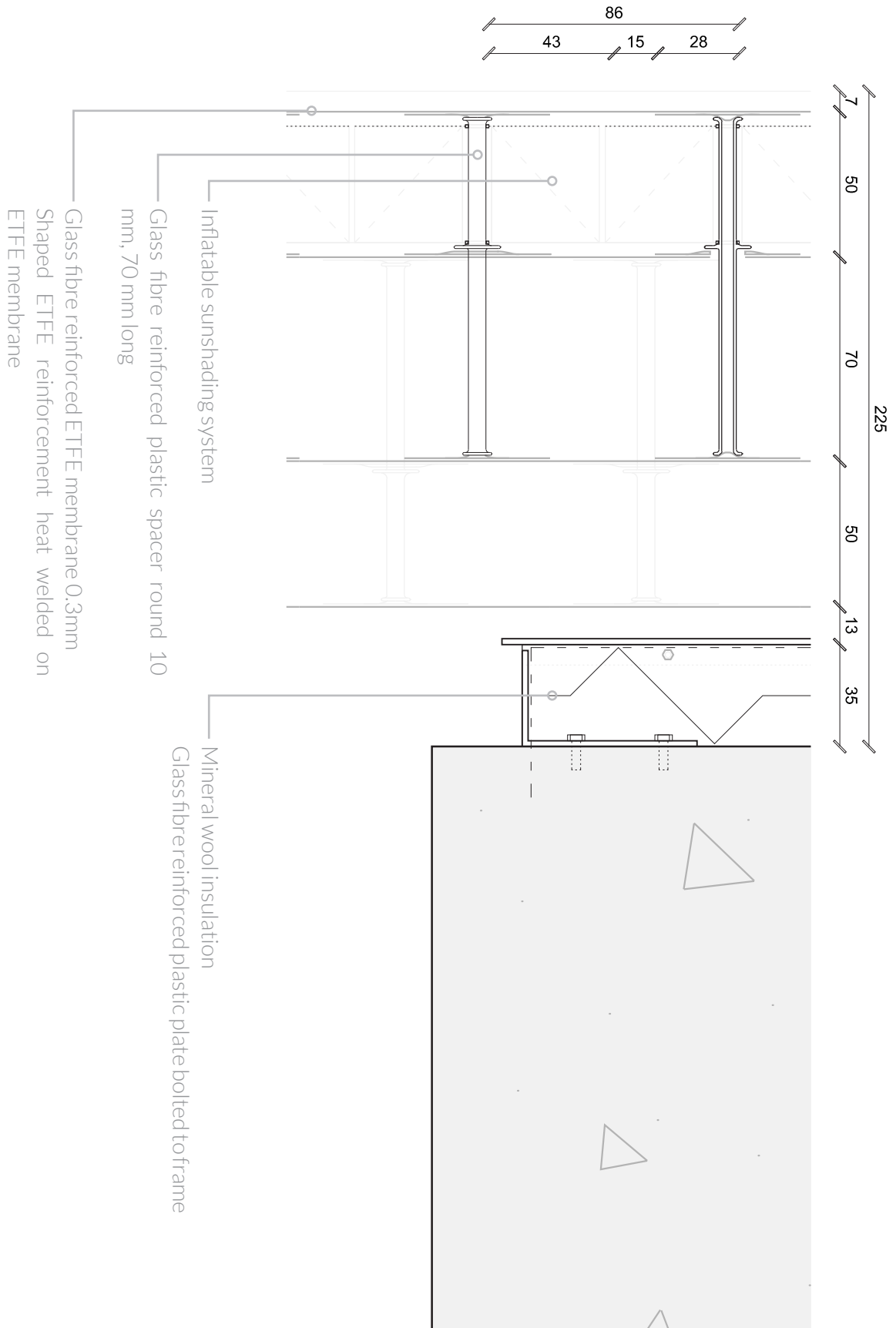
- I Steel support profile with setting bolt, bolted to side of frame
Support plate with setting pin

- J Aluminium covering plate, sealed at edges



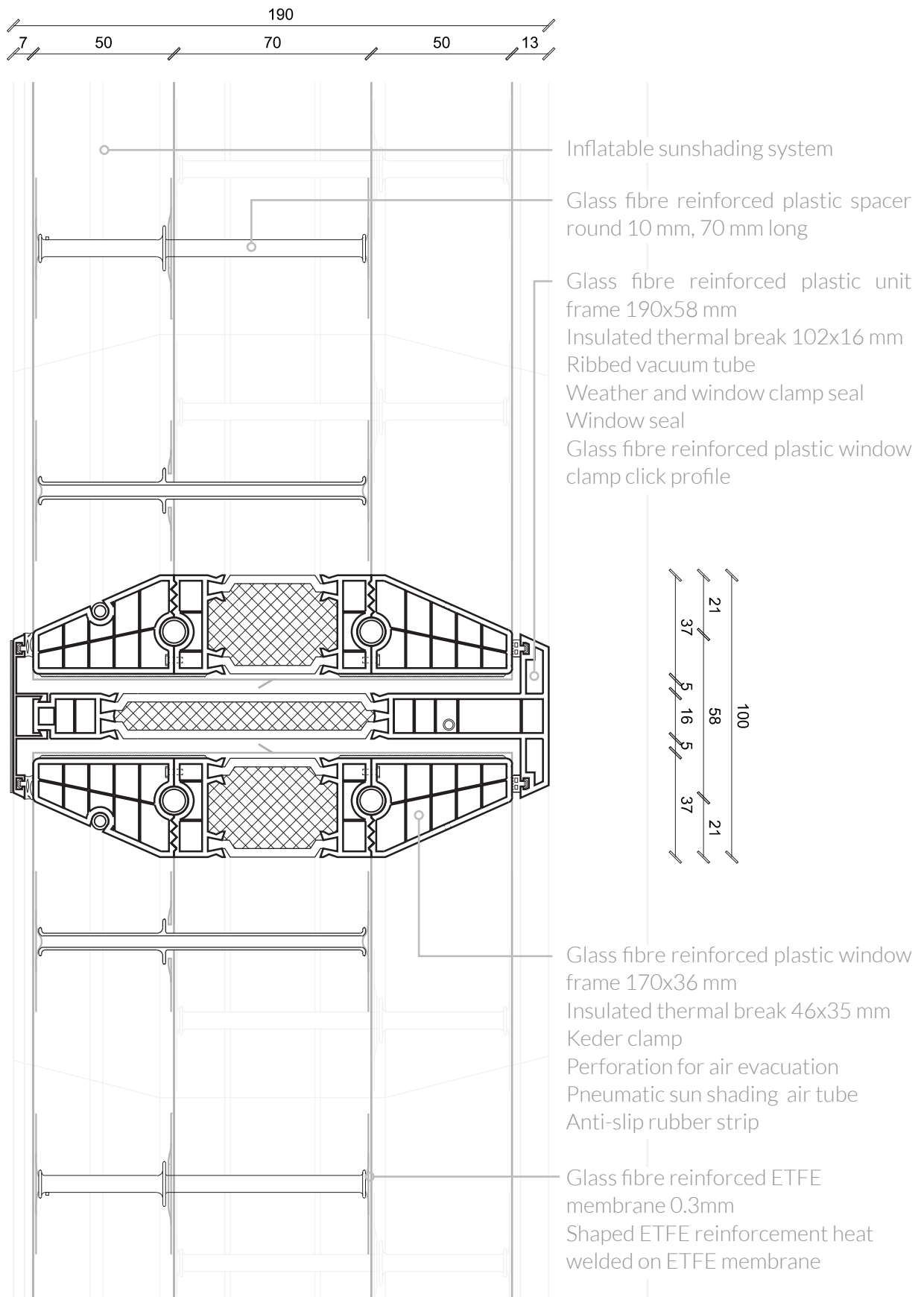
Detail 3

Unit in front of column - vertical - 1:2



Detail 4

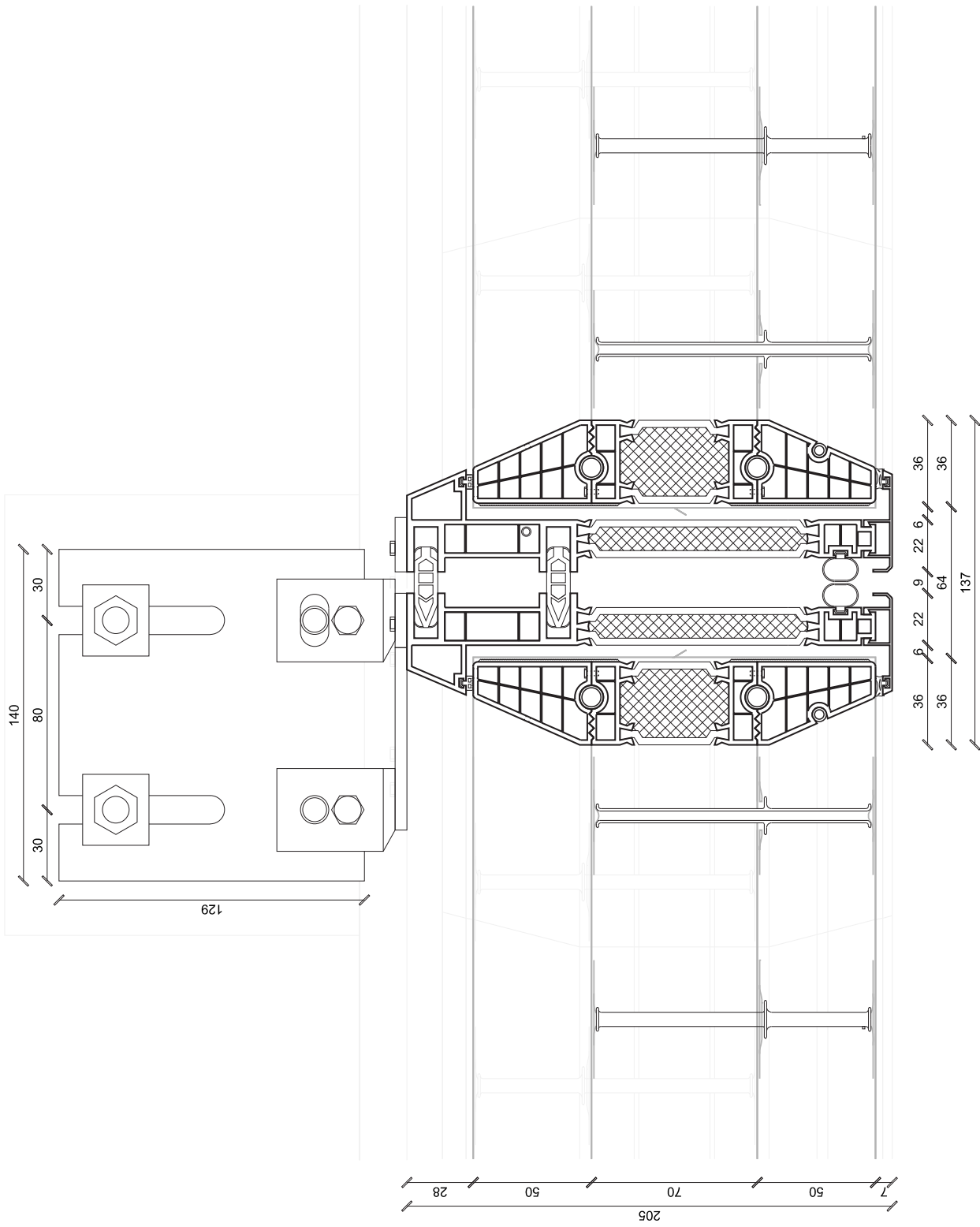
Panel connection to main frame - horizontal - 1:2



Detail 5

Unit connection - horizontal - >1:2

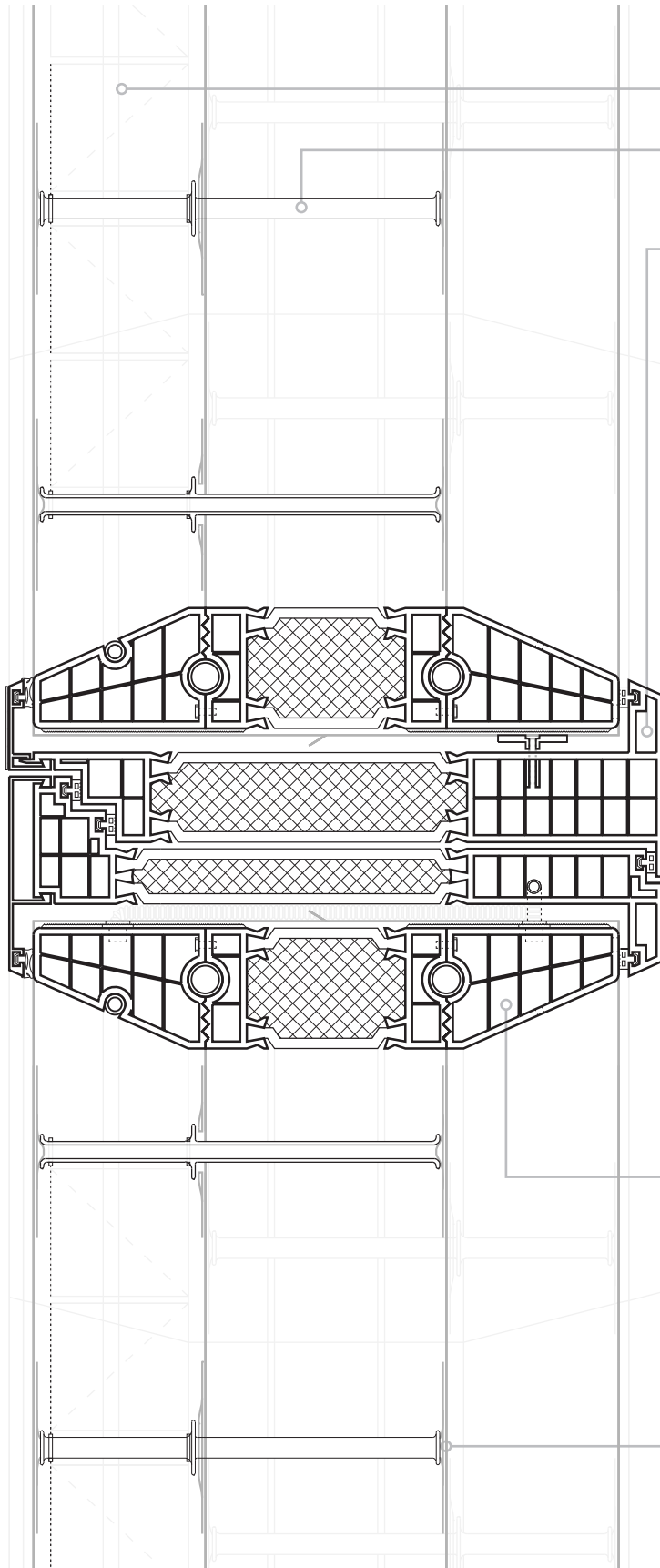
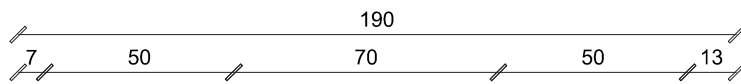
See detail two for detail description



* please refer to detail 2 for detail text

Detail 6

Window frame - vertical top - 1:2



Inflatable sunshading system

Glass fibre reinforced plastic spacer
round 10 mm, 70 mm long

Glass fibre reinforced plastic unit
frame 190x86 mm

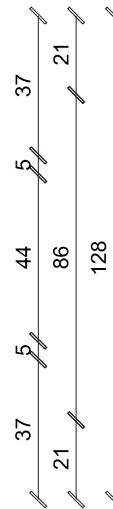
Insulated thermal break 102x44 mm

Ribbed vacuum tube

Weather and window clamp seal

Window seal

Glass fibre reinforced plastic window
clamp click profile



Glass fibre reinforced plastic window
frame 170x36 mm

Insulated thermal break 46x35 mm

Keder clamp

Perforation for air evacuation

Pneumatic sun shading air tube

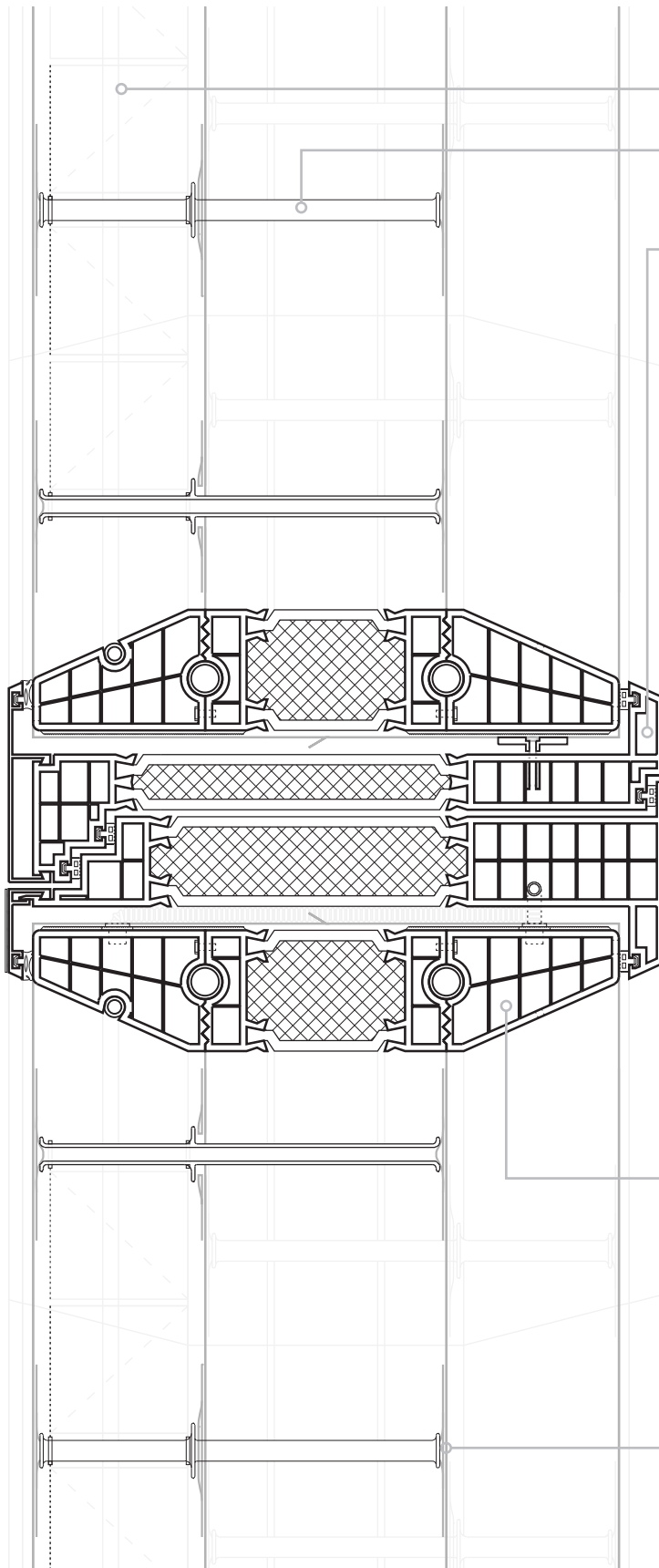
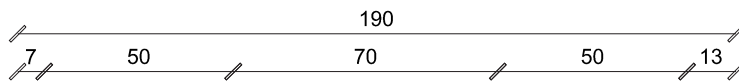
Anti-slip rubber strip

Glass fibre reinforced ETFE
membrane 0.3mm

Shaped ETFE reinforcement heat
welded on ETFE membrane

Detail 7

Window frame - vertical bottom - 1:2



Inflatable sunshading system

Glass fibre reinforced plastic spacer
round 10 mm, 70 mm long

Glass fibre reinforced plastic unit
frame 190x86 mm

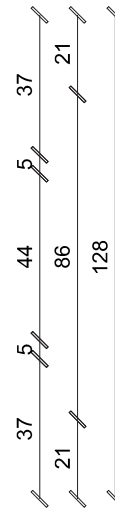
Insulated thermal break 102x44 mm

Ribbed vacuum tube

Weather and window clamp seal

Window seal

Glass fibre reinforced plastic window
clamp click profile



Glass fibre reinforced plastic window
frame 170x36 mm

Insulated thermal break 46x35 mm

Keder clamp

Perforation for air evacuation

Pneumatic sun shading air tube

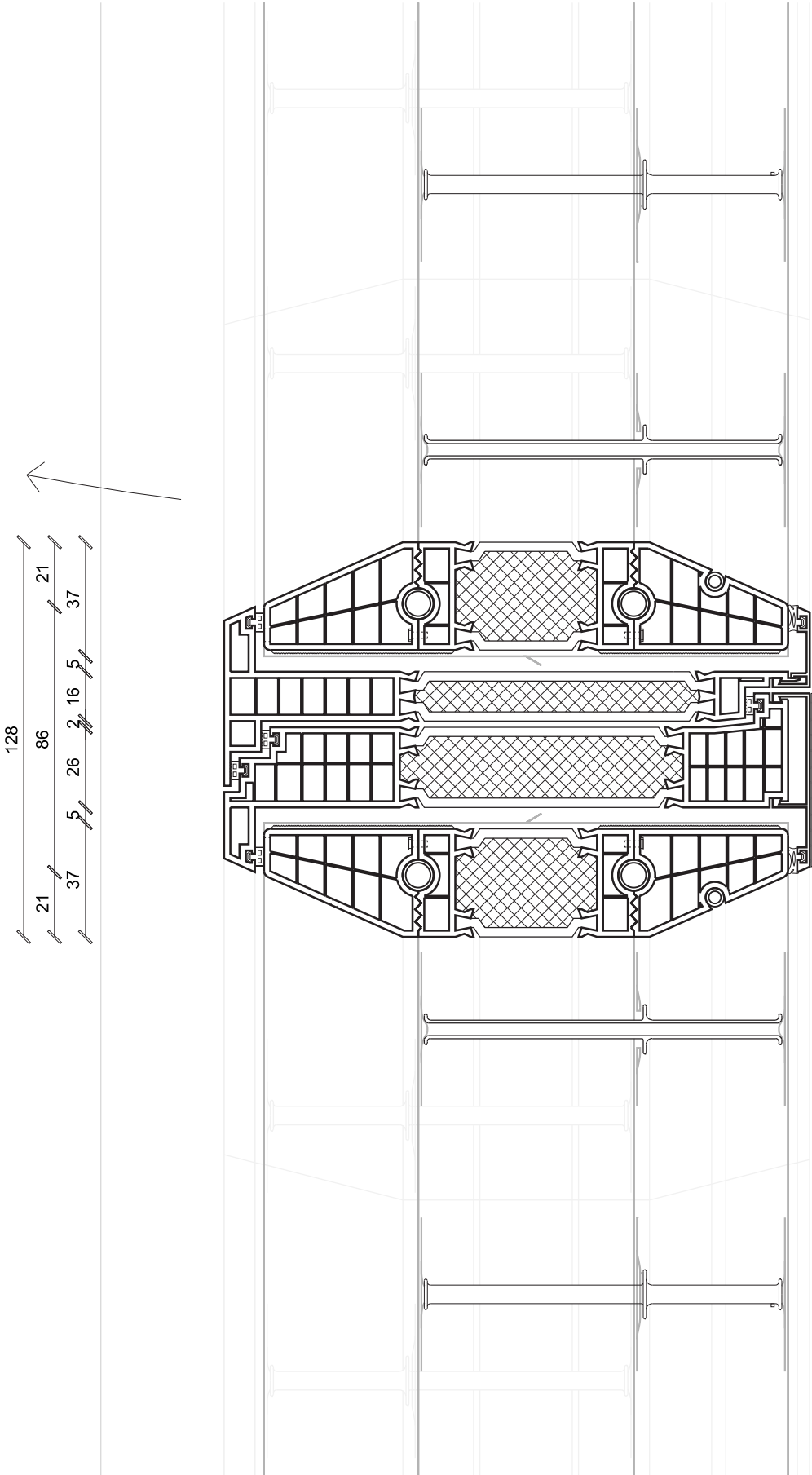
Anti-slip rubber strip

Glass fibre reinforced ETFE
membrane 0.3mm

Shaped ETFE reinforcement heat
welded on ETFE membrane

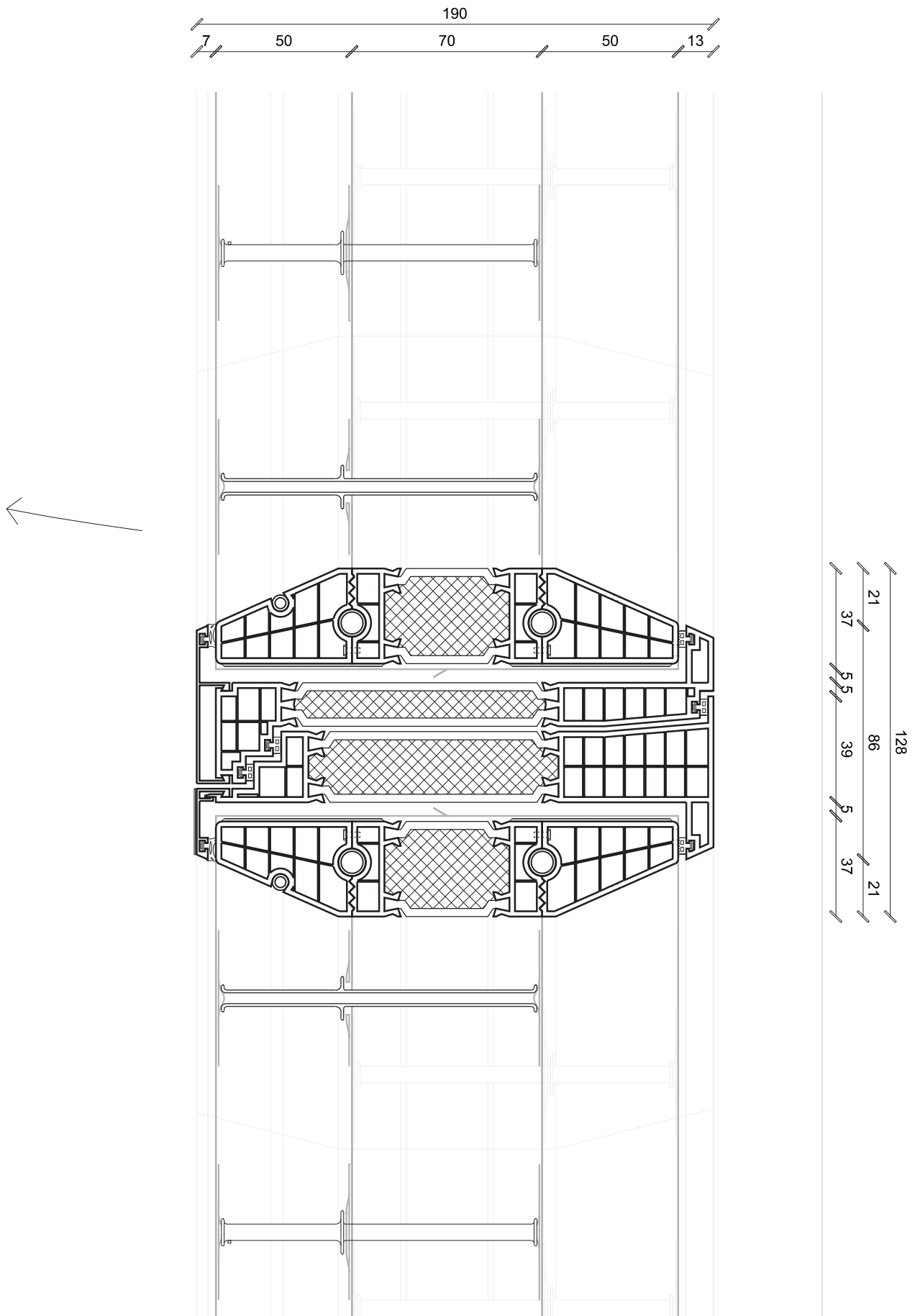
Detail 8

Window frame - horizontal left - 1:2



Detail 9

Window frame - horizontal right - 1:2



Detail 10

Moment fixed connection piece - 1:2

