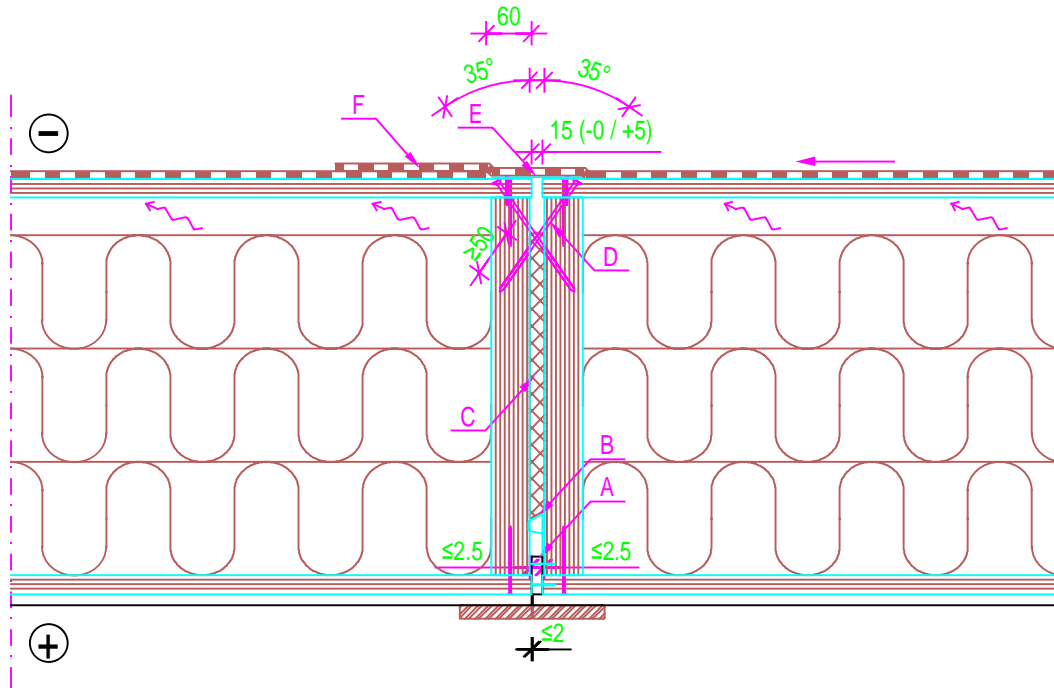


DATE CHANGE  
x.y.2014 UPDATED 113-17

CONTENT  
ELEMENT DETAILS  
KERTO-RIPA ROOF ELEMENT  
BOX SLAB

SCALE  
1:10

DATE 20.12.2013 DRAWING NUMBER **113**



ROOF ELEMENT MANUFACTURING:

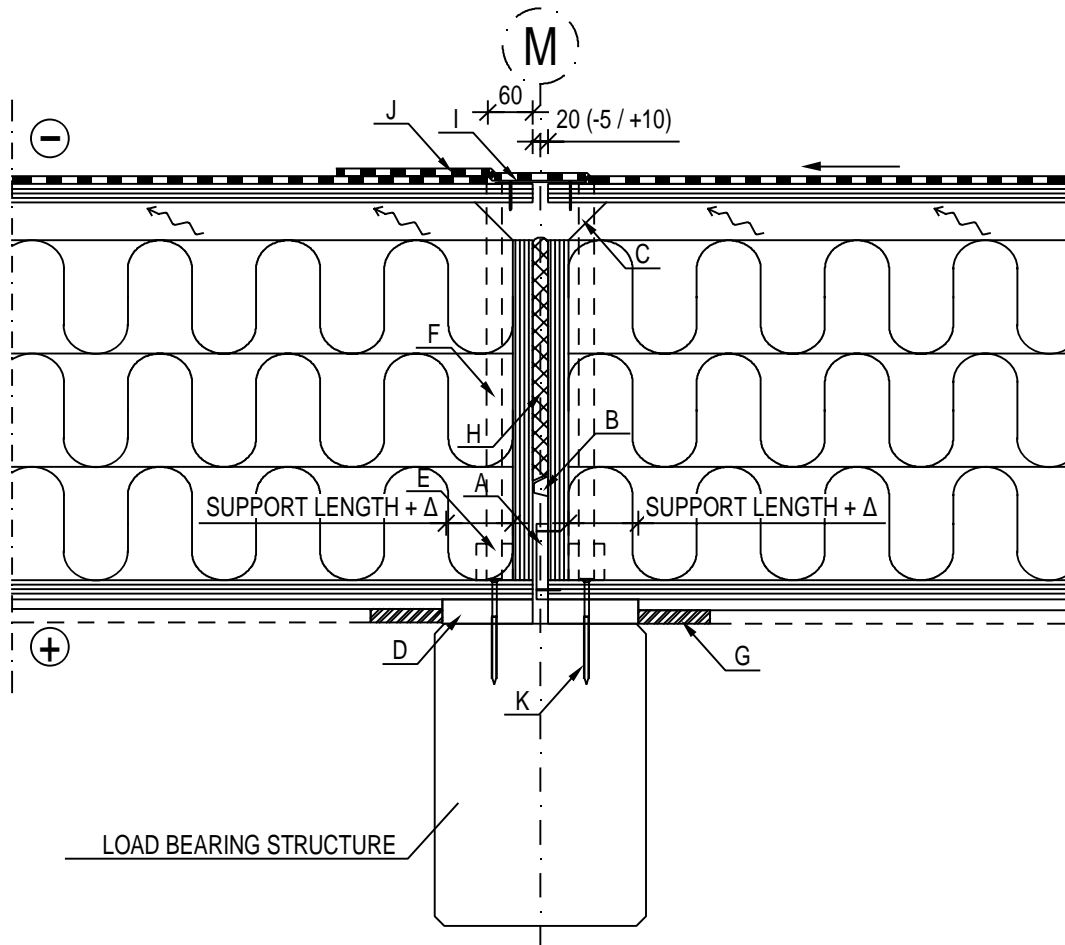
- A. METSÄ WOOD SPRUCE PLYWOOD 15x50 mm<sup>2</sup> STAPLED OR NAILED c/c 150 TO BOTTOM FLANGE AND c/c 300 TO RIB
- B. SEAL PROFILE

ROOF ELEMENT INSTALLATION:

- C. POLYURETHANE FOAM , FOAMED IN 2 LAYERS
- D. CRISSCROSS SCREWS, e. g. R6x180 ASSY c/c 300 ( c/c 600 / c/c 600 ), SCREW HEAD COMPLETELY EMBEDDED IN THE WOOD, TIP PENETRATION MIN. 50 mm
- E. SEAMS SUPPORT SHEET OF STEEL B = 120 mm t = 0.5 mm, NAIL- OR SCREW-FASTENING
- F. BOND OF WATER PROOFING

OTHER:

- TRANSMISSION OF BRACING FORCES OVER THE SEAM BY SEPARATE FASTENERS MUST BE DONE ACC. TO A SEPARATE BUILDING DESIGN
- PAY ATTENTION TO THE SEAMS SUPPORT SHEET OF STEEL AT START POSITION OF THE 1-LAYER PVC ROOF MEMBRANE OR BITUMINOUS UNDERLAY MEMBRANE



ROOF ELEMENT MANUFACTURING:

- A. METSÅ WOOD SPRUCE PLYWOOD 15x100 mm<sup>2</sup> STAPLED OR NAILED c/c 150 TO BOTTOM FLANGE AND c/c 300 TO RIB
- B. SEAL PROFILE
- C. CHAMFER OF RIBS END ADAPTED TO THE VENTILATING GAP
- D. KERTO-Q OR METSÅ WOOD SPRUCE PLYWOOD, THICKNESS = GYPSUM PLASTERBOARD + TIMBER BOARD
- E. SUPPORT PIECE 48x48 mm STEERING HOLE + SCREW-FASTENING AT THE END OF ELEMENT
- F. INSTALLATION PIPES  $\geq \varnothing 20$  mm
- G. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

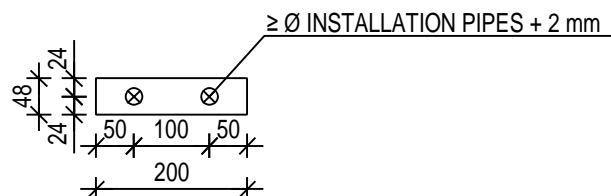
ROOF ELEMENT INSTALLATION:

- H. POLYURETHANE FOAM , FOAMED IN 2 LAYERS
- I. SEAMS SUPPORT SHEET OF STEEL = 120 mm t = 0.5 mm, NAIL- OR SCREW-FASTENING
- J. BOND OF WATER PROOFING
- K. SCREW FASTENING

OTHER:

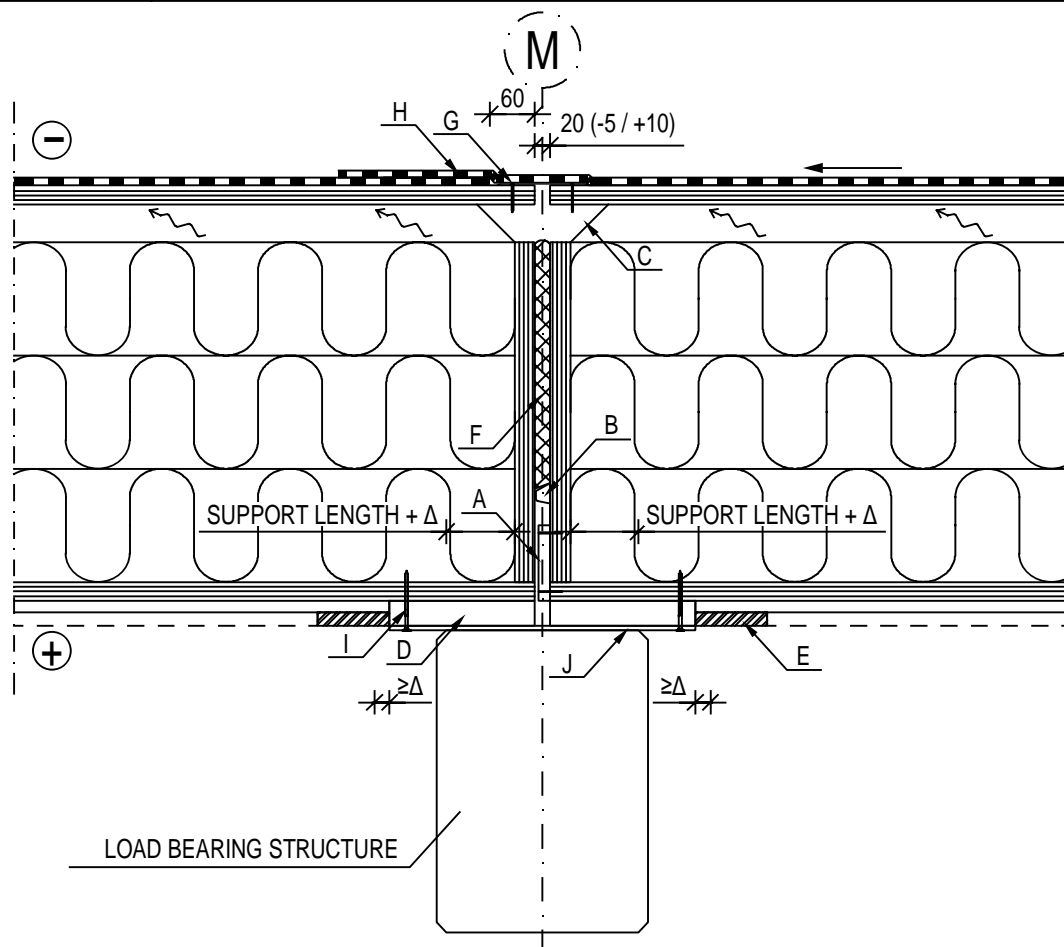
- $\Delta$  IS INSTALLATION TOLERANCE + HORISONTAL POSITIONING TOLERANCE OF THE LOAD BEARING STRUCTURES AT LENGTH DIRECTION OF ROOF ELEMENT
- PAY ATTENTION TO THE SEAMS SUPPORT SHEET OF STEEL AT START POSITION OF THE 1-LAYER PVC ROOF MEMBRANE OR BITUMINOUS UNDERLAY MEMBRANE

SUPPORT PIECE E.



**113-03 END JOINT, BOTTOM SIDE FASTENING  
BOX SLAB REI60 AND REI30**

20.12.2013



**ROOF ELEMENT MANUFACTURING:**

- A. METSÄ WOOD SPRUCE PLYWOOD 15x100 mm<sup>2</sup> STAPLED OR NAILED c/c 150 TO BOTTOM FLANGE AND c/c 300 TO RIB
- B. SEAL PROFILE
- C. CHAMFER OF RIBS END ADAPTED TO THE VENTILATING GAP
- D. KERTO-Q OR METSÄ WOOD SPRUCE PLYWOOD, THICKNESS = GYPSUM PLASTERBOARD + TIMBER BOARD, PU-GLUING
- E. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

**ROOF ELEMENT INSTALLATION:**

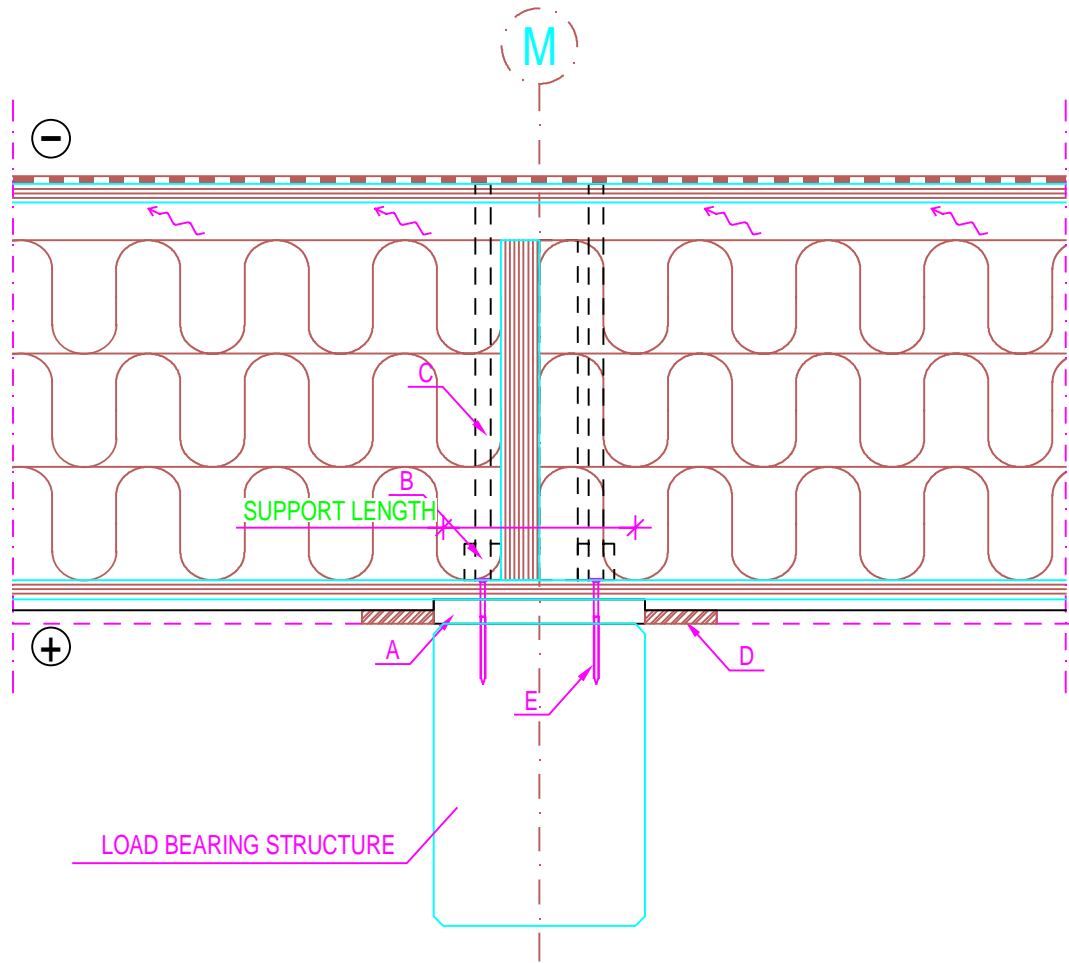
- F. POLYURETHANE FOAM , FOAMED IN 2 LAYERS
- G. SEAMS SUPPORTS SHEET OF STEEL B = 120 mm t = 0.5 mm, NAIL- OR SCREW-FASTENING
- H. BOND OF WATER PROOFING
- I. NAIL- OR SCREW-FASTENING

**BUILDING CONSTRUCTOR:**

- J. CONNECTION PLATE ON TOP OF THE LOAD BEARING STRUCTURE, FIRE PROTECTED IF NEEDED

**OTHER:**

- PAY ATTENTION TO THE SEAMS SUPPORT SHEET OF STEEL AT START POSITION OF THE 1-LAYER PVC ROOF MEMBRANE OR BITUMINOUS UNDERLAY MEMBRANE



ROOF ELEMENT MANUFACTURING:

- A. KERTO-Q OR METSÄ WOOD SPRUCE PLYWOOD , THICKNESS = GYPSUM PLASTERBOARD + TIMBER BOARD
- B. SUPPORT PIECE 48x48 mm STEERING HOLE + SCREW-FASTENING AT THE END OF ELEMENT
- C. INSTALLATION PIPES  $\geq \text{Ø}20$
- D. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

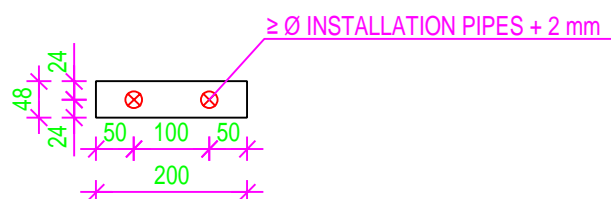
ROOF ELEMENT INSTALLATION:

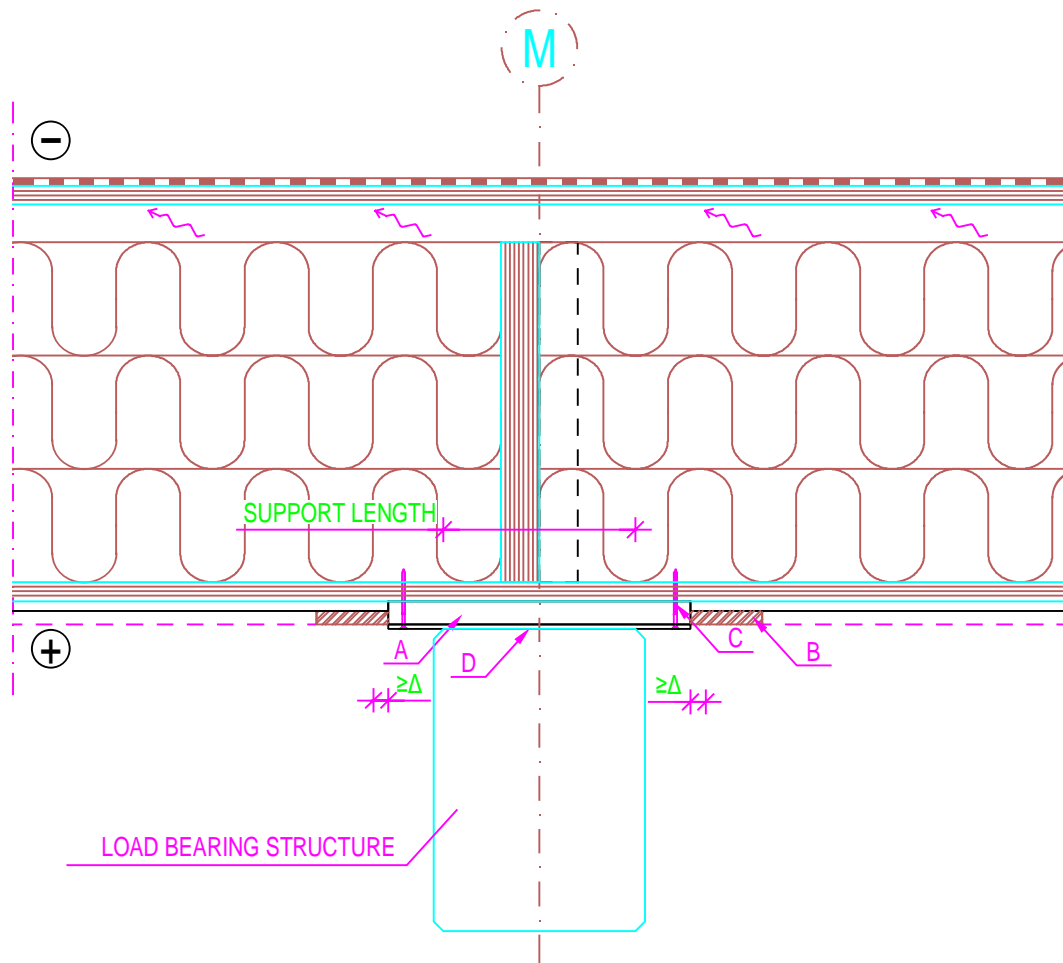
- E. SCREW FASTENING

OTHER:

- FASTENING TO THE SUPPORT ONE SIDED OR BOTH SIDED ACCORDING TO THE BUILDING DESIGN

SUPPORT PIECE B.





ROOF ELEMENT MANUFACTURING:

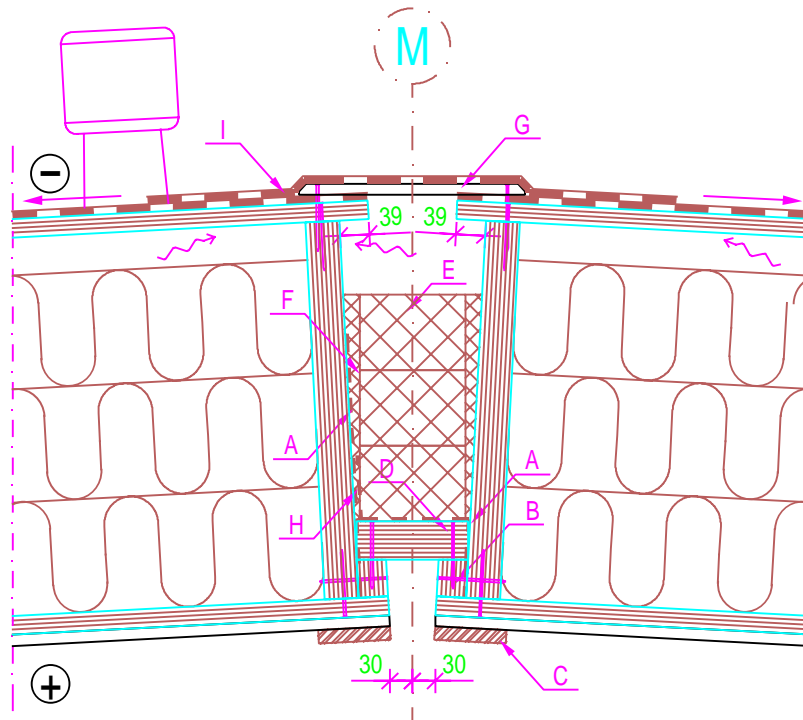
- A. KERTO-Q OR METSÄ WOOD SPRUCE PLYWOOD , THICKNESS = GYPSUM PLASTERBOARD + TIMBER BOARD, PU-GLUING
- B. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

ROOF ELEMENT INSTALLATION:

- C. NAIL- OR SCREW-FASTENING

BUILDING CONSTRUCTOR:

- D. CONNECTION PLATE ON TOP OF THE LOAD BEARING STRUCTURE, FIRE PROTECTED IF NEEDED



ROOF ELEMENT MANUFACTURING:

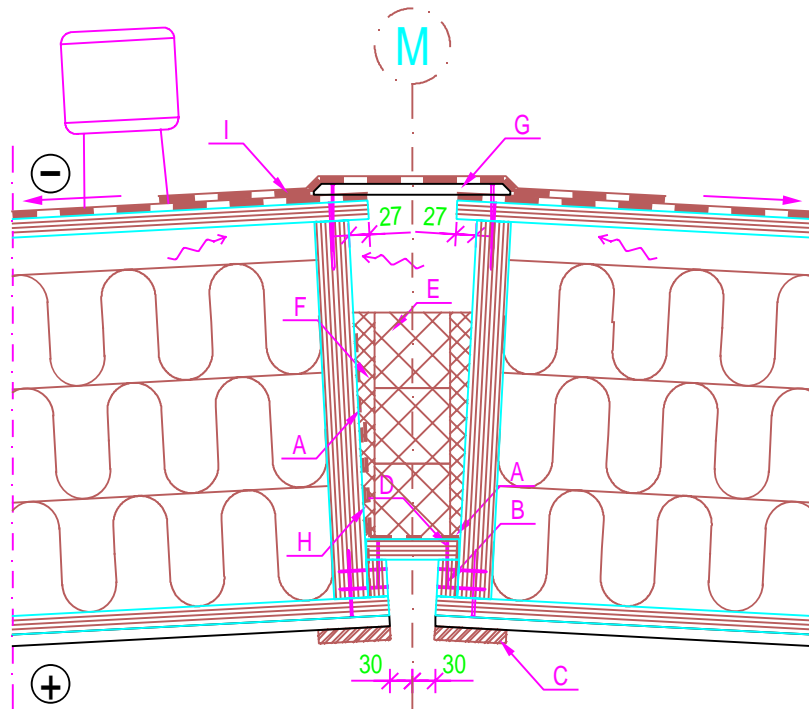
- A. VAPOUR BARRIER B = 350 mm
- B. RISER KERTO-S OR KERTO-Q  $\geq 39 \times 50$
- C. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

ROOF ELEMENT INSTALLATION:

- D. KERTO-S OR KERTO-Q. THICKNESS  $\geq 51$  mm
- E. POLYURETHANE INSULATING SHEET, CLASSIFICATION RATE OF TOP SURFACE B-s1,d0
- F. POLYURETHANE FOAM, FOAMED IN 2 LAYERS
- G. METSÄ WOOD SPRUCE PLYWOOD  $t \geq 15$  mm EDGES CHAMFERED
- H. BOND OF VAPOUR BARRIER AND MECHANICAL FASTENING
- I. BOND OF WATER PROOFING

OTHER:

- DIVIDE THE VENTILATING GAP INTO FIRE PARTS AND FIRE PARTITIONS



ROOF ELEMENT MANUFACTURING:

- A. VAPOUR BARRIER B = 350 mm
- B. RISER KERTO-S OR KERTO-Q  $\geq 27 \times 50$
- C. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

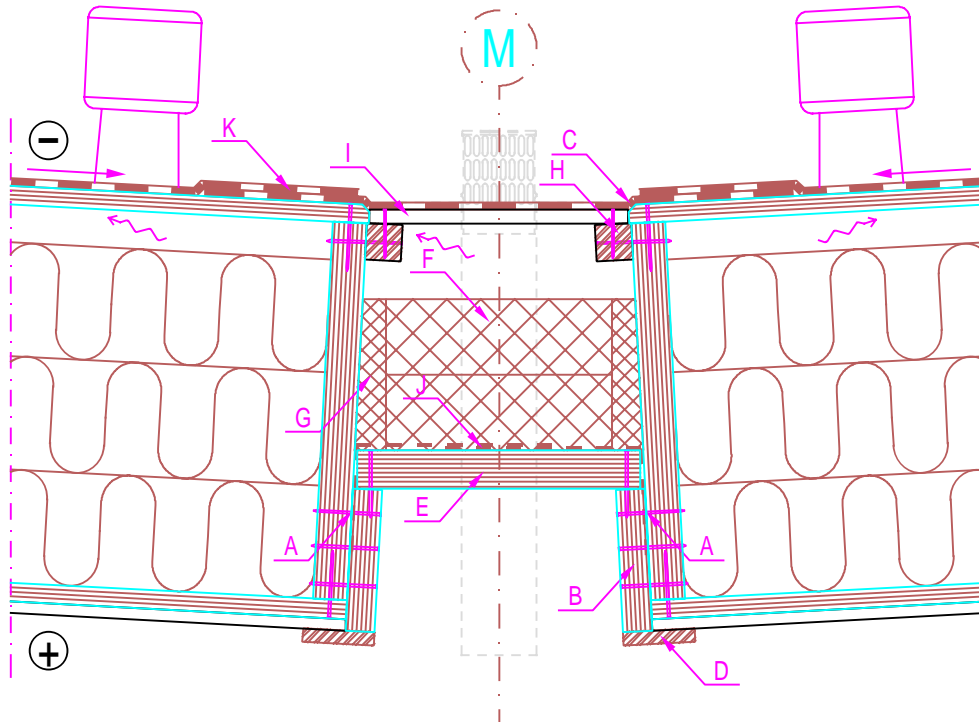
ROOF ELEMENT INSTALLATION:

- D. KERTO-S OR KERTO-Q. THICKNESS  $\geq 27$  mm
- E. POLYURETHANE INSULATING SHEET , CLASSIFICATION RATE OF TOP SURFACE B-s1,d0
- F. POLYURETHANE FOAM, FOAMED IN 2 LAYERS
- G. METSÄ WOOD SPRUCE PLYWOOD  $t \geq 15$  mm EDGES CHAMFERED
- H. BOND OF VAPOUR BARRIER AND MECHANICAL FASTENING
- I. BOND OF WATER PROOFING

OTHER:

- DIVIDE THE VENTILATING GAP INTO FIRE PARTS AND FIRE PARTITIONS





ROOF ELEMENT MANUFACTURING:

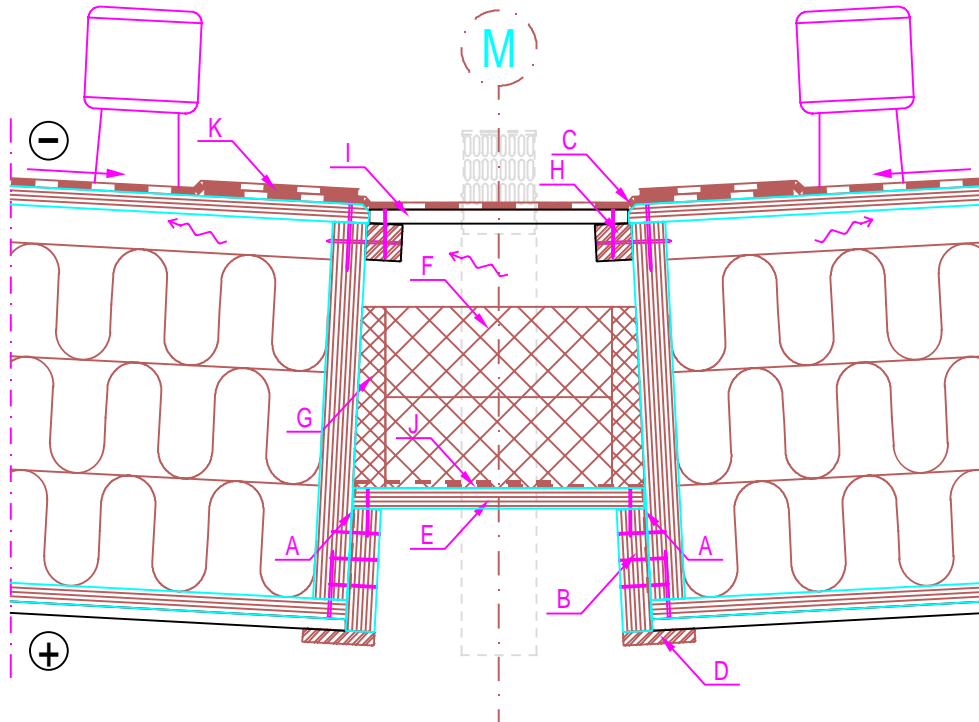
- A. VAPOUR BARRIER, BONDING, MECHANICAL FASTENING
- B. RISER KERTO-S  $\geq 39 \times 100$
- C. EDGES CHAMFERED
- D. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

ROOF ELEMENT INSTALLATION:

- E. KERTO-Q PANEL, THICKNESS  $\geq 51$  mm
- F. POLYURETHANE INSULATING SHEET, CLASSIFICATION RATE OF TOP SURFACE B-s1,d0
- G. POLYURETHANE FOAM, FOAMED IN 2 LAYERS
- H. SUPPORT BATTEN 48x48 mm
- I. METSÄ WOOD SPRUCE PLYWOOD  $t \geq 15$  mm
- J. VAPOUR BARRIER, BONDING, MECHANICAL FASTENING
- K. BOND OF WATER PROOFING

OTHER:

- DIVIDE THE VENTILATING GAP INTO FIRE PARTS AND FIRE PARTITIONS
- THROUGH HOLES VAPOUR BARRIER
- OBSERVE THE LOCATION OF ROOF BEARING STRUCTURE WHEN PLACING THROUGH HOLES
- CHUTES COUNTER-SLOPE TO CATCH PITS



ROOF ELEMENT MANUFACTURING:

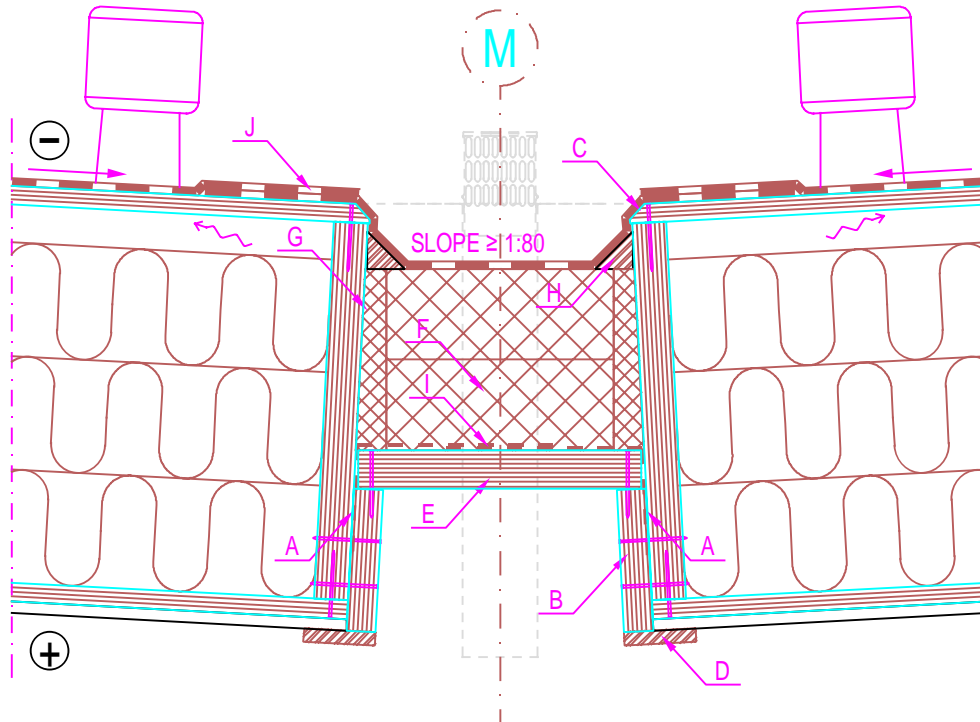
- A. VAPOUR BARRIER
- B. RISER KERTO-S  $\geq 39 \times 100$
- C. EDGES CHAMFERED
- D. TIMBER 18x95, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

ROOF ELEMENT INSTALLATION:

- E. KERTO-Q PANEL, THICKNESS  $\geq 27$  mm
- F. POLYURETHANE INSULATING SHEET, CLASSIFICATION RATE OF TOP SURFACE B-s1,d0
- G. POLYURETHANE FOAM, FOAMED IN 2 LAYERS
- H. SUPPORT BATTEN 48x48 mm
- I. METSÄ WOOD SPRUCE PLYWOOD  $t \geq 15$  mm
- J. VAPOUR BARRIER, BONDING, MECHANICAL FASTENING
- K. BOND OF WATER PROOFING

OTHER:

- DIVIDE THE VENTILATING GAP INTO FIRE PARTS AND FIRE PARTITIONS
- THROUGH HOLES VAPOUR BARRIER
- OBSERVE THE LOCATION OF ROOF BEARING STRUCTURE WHEN PLACING THROUGH HOLES
- CHUTES COUNTER-SLOPE TO CATCH PITS



ROOF ELEMENT MANUFACTURING:

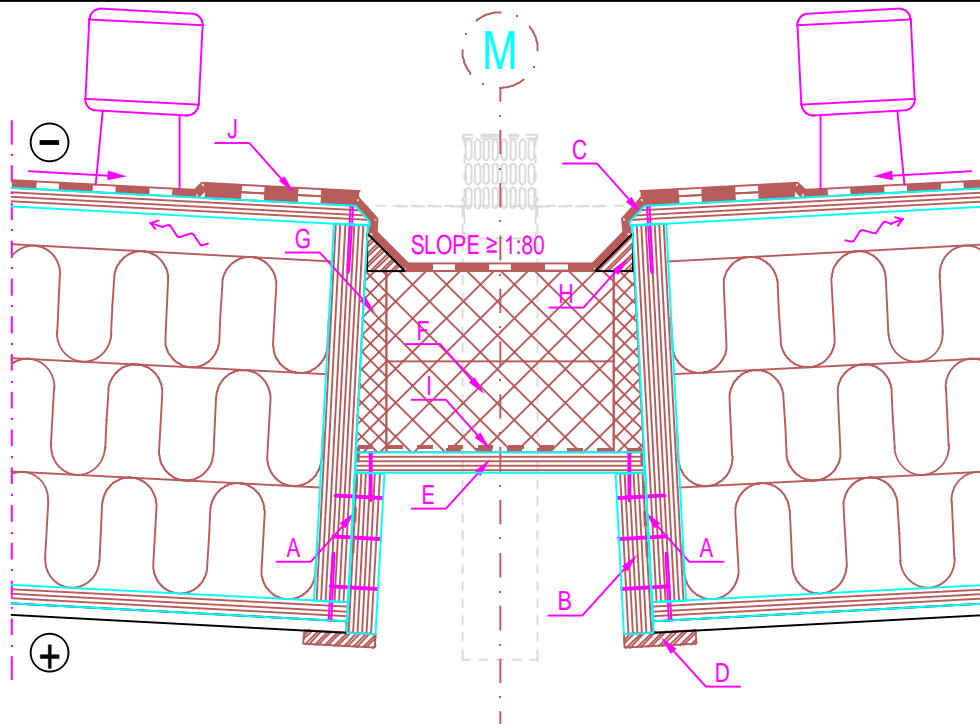
- A. VAPOUR BARRIER
- B. RISER KERTO-S  $\geq 39 \times 100$ , SINGLE-PITCH BEAM
- C. EDGES CHAMFERED
- D. TIMBER  $18 \times 95$ , IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

ROOF ELEMENT INSTALLATION:

- E. KERTO-Q PANEL, THICKNESS  $\geq 51$  mm
- F. POLYURETHANE INSULATING SHEET, CLASSIFICATION RATE OF TOP SURFACE B-s1,d0
- G. POLYURETHANE FOAM, FOAMED IN 2 LAYERS
- H. TRIANGLE BATTENS  $45 \times 45$  mm, IN CASE OF BITUMINOUS MEMBRANE COVER
- I. VAPOUR BARRIER, BONDING, MECHANICAL FASTENING
- J. BOND OF WATER PROOFING

OTHER:

- THROUGH HOLES VAPOUR BARRIER
- OBSERVE THE LOCATION OF ROOF BEARING STRUCTURE WHEN PLACING THROUGH HOLES



ROOF ELEMENT MANUFACTURING:

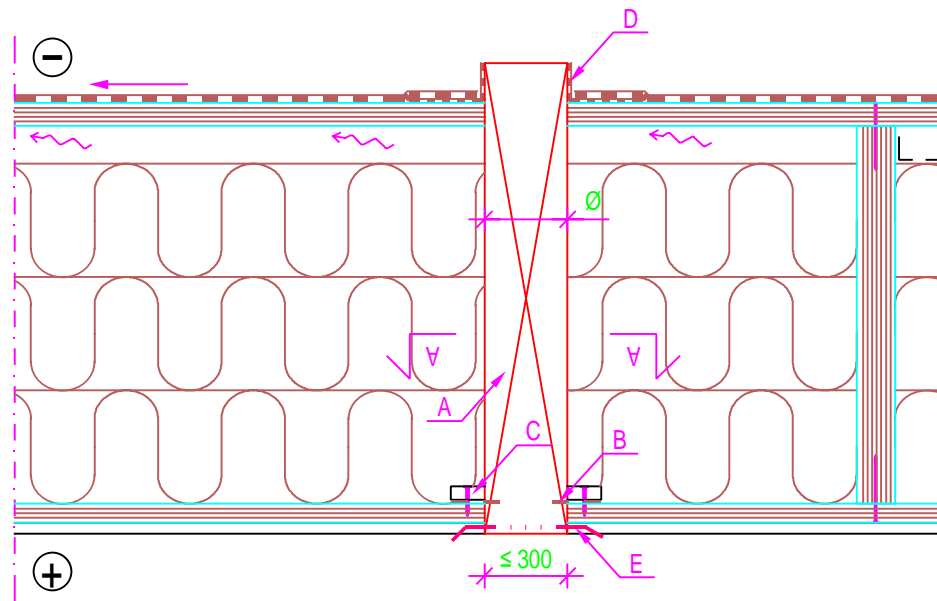
- A. VAPOUR BARRIER
- B. RISER KERTO-S  $\geq 39 \times 100$ , SINGLE-PITCH BEAM
- C. EDGES CHAMFERED
- D. TIMBER  $18 \times 95$ , IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2

ROOF ELEMENT INSTALLATION:

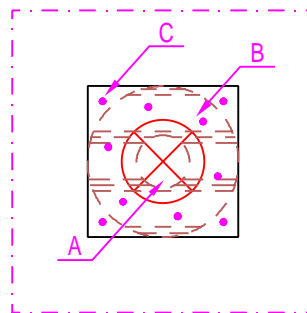
- E. KERTO-Q PANEL, THICKNESS  $\geq 27$  mm
- F. POLYURETHANE INSULATING SHEET, CLASSIFICATION RATE OF TOP SURFACE B-s1,d0
- G. POLYURETHANE FOAM, FOAMED IN 2 LAYERS
- H. TRIANGLE BATTENS  $45 \times 45$  mm, IN CASE OF BITUMINOUS MEMBRANE COVER
- I. VAPOUR BARRIER, BONDING, MECHANICAL FASTENING
- J. BOND OF WATER PROOFING

OTHER:

- THROUGH HOLES VAPOUR BARRIER
- OBSERVE THE LOCATION OF ROOF BEARING STRUCTURE WHEN PLACING THROUGH HOLES



### SECTION A-A



A. THROUGH HOLES

ROOF ELEMENT MANUFACTURING:

- B. VAPOUR BARRIERS THROUGH HOLES COLLAR, LEAK-PROOF GLUED TO THE KERTO-Q PANEL
- C. METSÄ WOOD SPRUCE PLYWOOD  $t \geq 15$  mm, MECHANICAL FASTENING

ROOF ELEMENT INSTALLATION:

- D. THROUGH HOLES COLLAR, MUST BE LEAK-PROOF BONDED WITH THE WATER RESISTANT COVER

BUILDING CONSTRUCTOR:

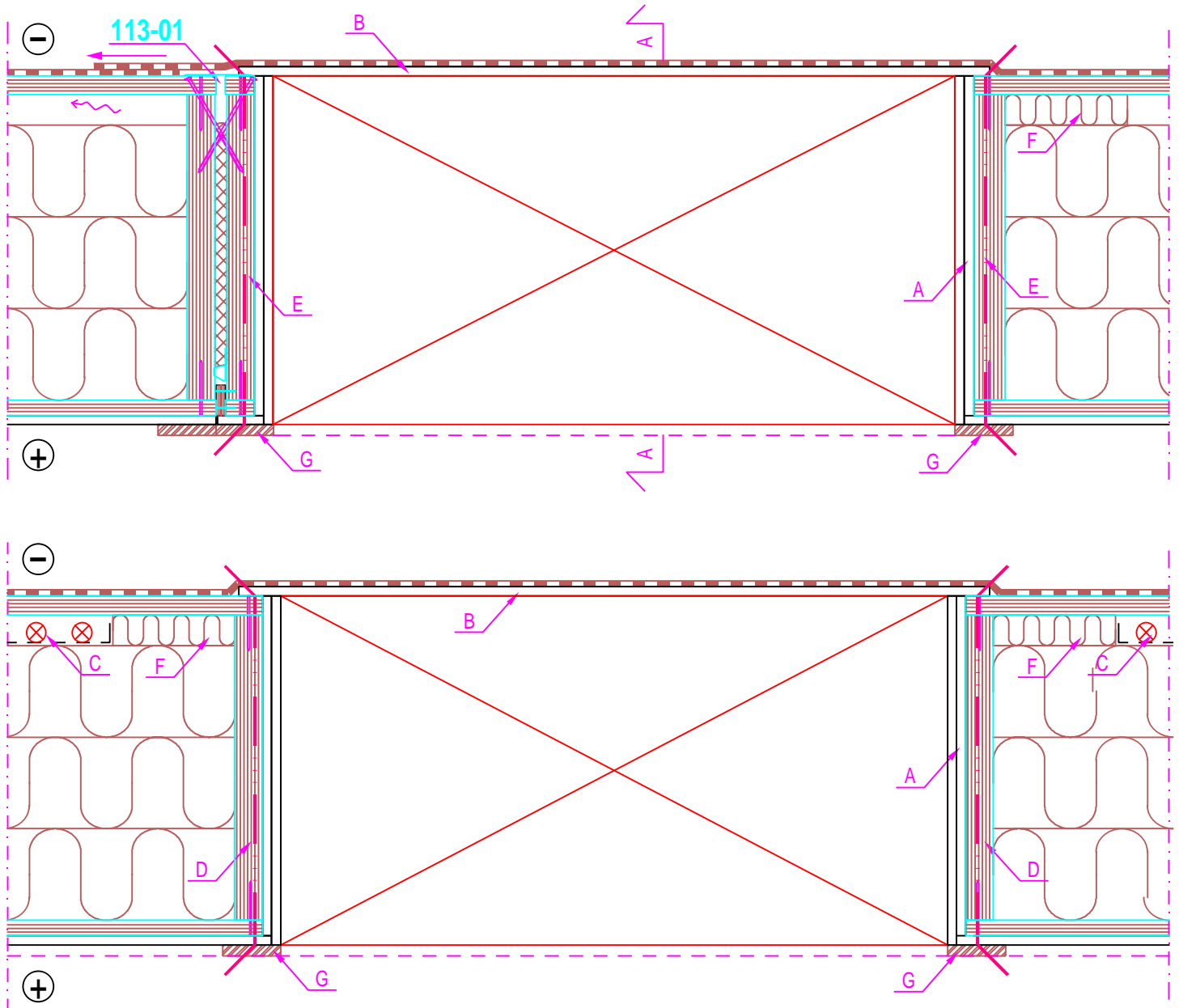
- E. FIRE SEALING OF THROUGH HOLES, REI60 OR REI30 WITH RESPECT TO THE DEMAND OF STRUCTURE

OTHER:

- $\emptyset$  = THROUGH HOLES + 40 mm

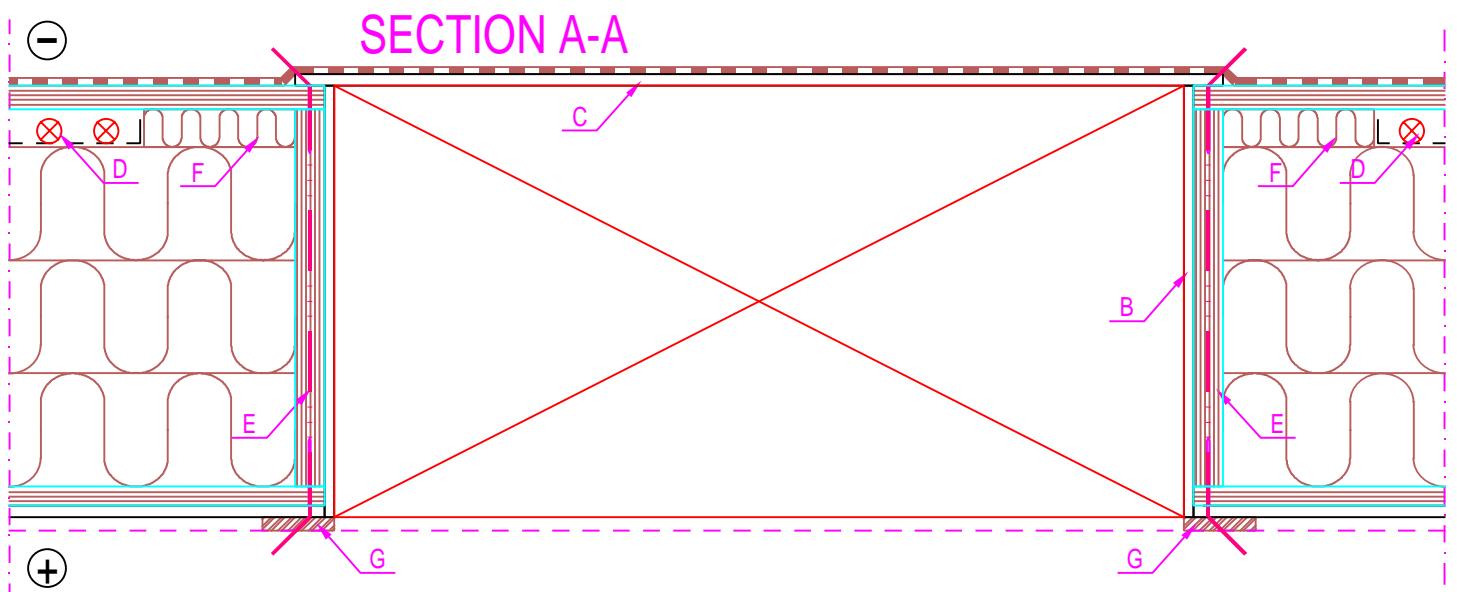
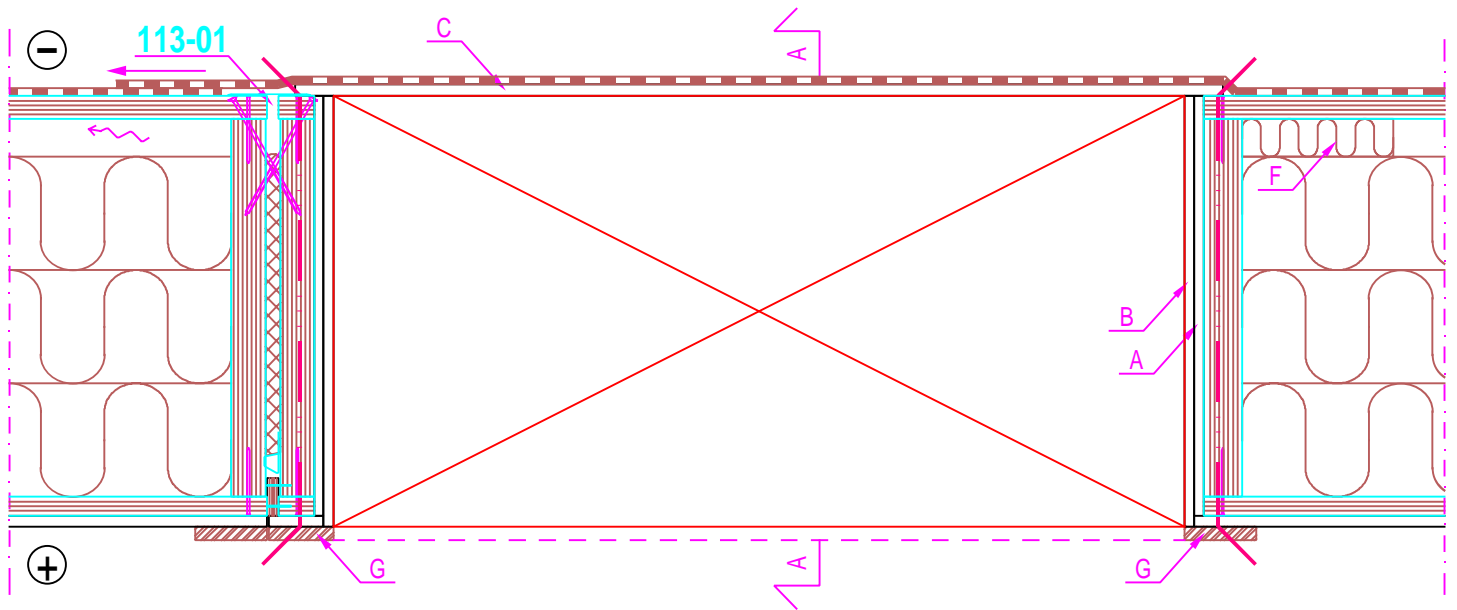
113-13 LARGE OPENINGS, DIAMETER OVER 300 mm  
BOX SLAB REI60

20.12.2013



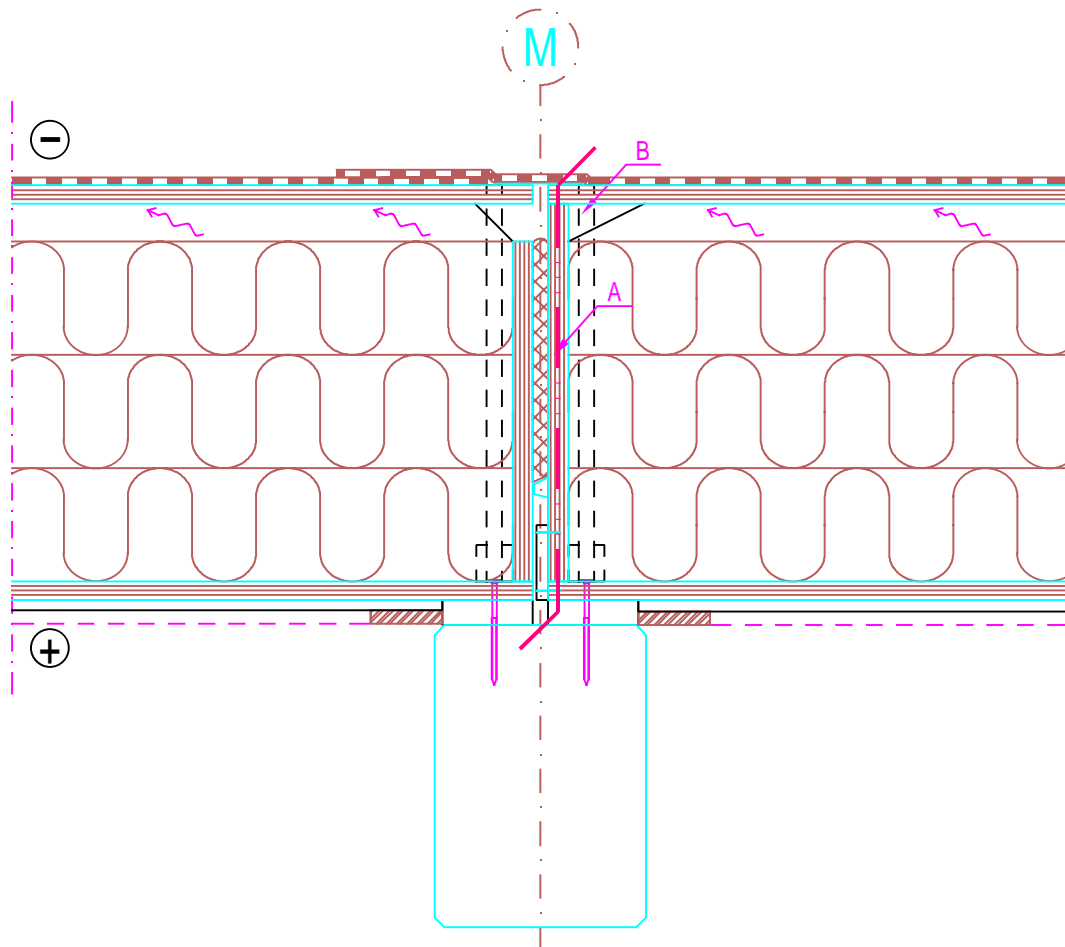
ROOF ELEMENT MANUFACTURING:

- A. 2x GYPSUM PLASTERBOARD TYPE F  $t \geq 15$  mm, ENVELOPED
- B. PLYWOOD SHIELDING DURING CONSTRUCTIONAL PERIOD, SCREW FASTENING, THICKNESS ACC. TO TARGETED DESIGN
- C. VENTILATION HOLES TO ADJACENT HOLLOW CORE
- D. KERTO-S  $t \geq 45$  mm + INCLINED SCREW FASTENING GLUE-SEALED AROUND (NOT CONSTRUCTIONAL)
- E. KERTO-S RIB  $t \geq 45$  mm
- F. MINERAL WOOL STRIP  $B = 200$  mm
- G. TIMBER 18x95, ENVELOPED, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2



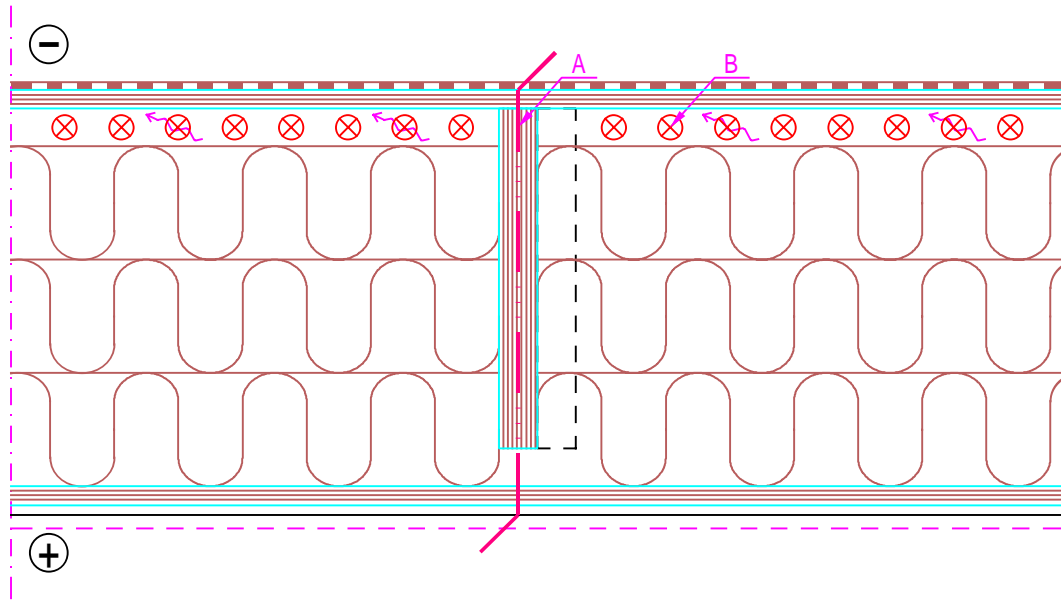
ROOF ELEMENT MANUFACTURING:

- A. METSÄ WOOD SPRUCE PLYWOOD  $t \geq 12$  mm
- B. GYPSUM PLASTERBOARD TYPE A  $t \geq 13$  mm, ENVELOPED
- C. PLYWOOD SHIELDING DURING CONSTRUCTIONAL PERIOD, SCREW FASTENING, THICKNESS ACC. TO TARGETED DESIGN
- D. VENTILATION HOLES TO ADJACENT HOLLOW CORE
- E. KERTO-S  $t \geq 39$  mm + INCLINED SCREW FASTENING GLUE-SEALED AROUND (NOT CONSTRUCTIONAL)
- F. MINERAL WOOL STRIP  $B = 200$  mm
- G. TIMBER 18x95, ENVELOPED, IF THE CLASSIFICATION RATE OF THE BOARD SHEETING AND INTERIOR SURFACE IS MAX. D-s2,d2



- A. END STIFFENER ATTACHED TO THE TOP SLAB, GLUE-SEALED AROUND ( NOT CONSTRUCTIONAL GLUING )
- B. CHAMFER OF RIBS END ADAPTED TO THE VENTILATING GAP, CROSS-SECTION AREA FOR THE SEAL PROFILE MUST BE ADEQUATE





- A. TRANSVERSE STIFFENER ATTACHED TO THE TOP SLAB, GLUE-SEALED AROUND (NOT CONSTRUCTIONAL GLUING)
- B. INTERMEDIATE RIBS MUST BE PERFORATED ON BOTH SIDES OF THE TRANSVERSE STIFFENER 10x Ø32 mm c/c75 mm

OTHER:  
EDGE RIBS ARE NOT PERFORATED

## DIMENSIONING THE SUSPENSION JOINT

A SUSPENSION JOINT CAN BE MADE TO THE LOWER SLAB OF KERTO-S OR KERTO-Q OR RIBS TO THE KERTO-S BY SCREWING OR NAILING. ENCLOSED LISTS INCLUDE MAIN PRINCIPLES OF DIMENSIONING THE JOINT ACC. TO EN 1995.

ALL REFERENCE MARKS ARE FROM THE SCREW-, AND NAIL-JOINT INSTRUCTIONS IN THE KERTO-MANUAL. FURTHER DETAILED INFORMATION ABOUT DIMENSIONING JOINTS CAN BE FOUND FROM THERE.

<<http://www.metsawood.fi/latausalue/pages/Kerto-kasikirja.aspx>>

### - NAIL JOINT TO THE FACE SURFACE OF KERTO-S OR KERTO-Q:

1. ONLY PROFILED NAILS ARE ALLOWED
2. PENETRATION DEPTH OF NAILS TIP MIN. 8d , TIP ITSELF IS EXCLUDED
3. PREDRILLING IF NEEDED SEE CHAPTER 2
4. NAILS PLACEMENT ACC. TO TABLE 9
5. CHARACTERISTIC VALUE OF THE PULLOUT STRENGTH (22)

### - NAIL JOINT TO THE EDGE SURFACE OF KERTO-S OR KERTO-Q:

1. ONLY PROFILED NAILS ARE ALLOWED
2. PENETRATION DEPTH OF NAILS TIP MIN. 12d , TIP ITSELF IS EXCLUDED
3. PREDRILLING IF NEEDED SEE CHAPTER 2
4. NAILS PLACEMENT ACC. TO TABLE 10
5. CHARACTERISTIC VALUE OF THE PULLOUT STRENGTH (22)

### - SCREW JOINT TO THE FACE SURFACE OF KERTO-S OR KERTO-Q:

1. PENETRATION DEPTH OF SCREWS TIP IN KERTO-Q SLAB MIN. 3,5d , THE SCREW TIP COMPLETELY THROUGH THE SLAB. FOR KERTO-S MIN. 6d , TIP ITSELF EXCLUDED
2. SCREWS PLACEMENT ACC. TO TABLE 9
3. PREDRILLING IF NEEDED OR A SCREW WITH A DRILLING TIP, SEE CHAPTER 2
4. PULLING CAPABILITY OF SCREWS TIP AT THE FACE SURFACE (39) OR (42)
5. PULL-THROUGH CAPABILITY OF SCREWS HEAD (45)
6. TENSILE STRENGTH CAPABILITY OF THE SCREW JOINT (46)

### - SCREW JOINT TO THE EDGE OF KERTO-S OR KERTO-Q:

1. PENETRATION DEPTH OF SCREWS TIP MIN. 6d , TIP ITSELF EXCLUDED
2. SCREWS PLACEMENT ACC. TO TABLE 10
3. PULLING CAPABILITY OF SCREWS TIP AT THE EDGE SURFACE (44)
4. PULL-THROUGH CAPABILITY OF SCREWS HEAD (45)
5. TENSILE STRENGTH CAPABILITY OF THE SCREW JOINT (46)

DIMENSIONING INFORMATION ABOUT SPECIFIC NAIL-, AND SCREW-PARAMETERS CAN BE FOUND FROM THE CE-MARK MADE BY THE FASTENER MANUFACTURERS.

- HOLES CAN BE SEALED WITH SEALING COMPOUND, IF THE FASTENER IS REMOVED

## SUSPENSION FASTENING WITH THE Würth WüMAX-Vertigo -ADJUSTMENT SCREW



NOMINAL SIZE OF THE ADJUSTMENT SCREW: 6,5x70

THE HEAD PART CAN BE CHOSEN BETWEEN M8 OR M10 INNER THREAD PART

ALLOWED SUSPENDED LOAD 100 kg / SCREW

PLACEMENT AT THE ELEMENTS BOTTOM SLAB SURFACE:

MIN. JOINT SPACING 50 mm

MIN. DISTANCE FROM THE ELEMENTS EDGE 30 mm

MIN. DISTANCE FROM THE ELEMENTS END 70 mm

TO BE SCREWED THROUGH THE KERTO-Q SLAB

OTHER:

THE AMOUNT OF SUSPENSIONS MAY BE LIMITED BY THE SPECIFIED SUSPENSION LOAD  $\text{kN/m}^2$  OF THE STRUCTURAL DESIGN

Manufacturing tolerances for Kerto-Ripa elements

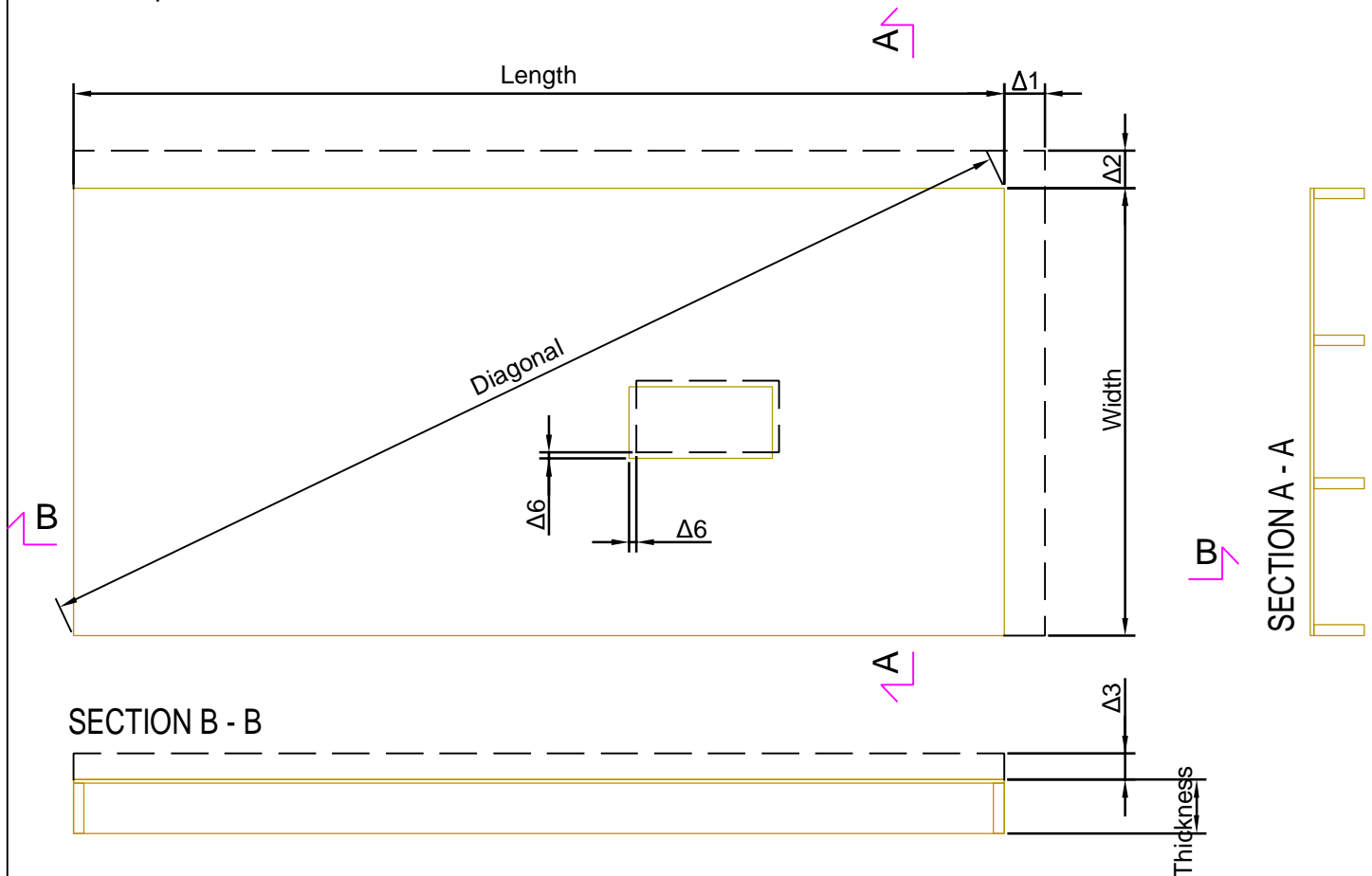
Manufacturing class 3, according to standard SFS 5978:2014

$\Delta 1$ = Length	+/- 5 mm
$\Delta 2$ = Width	+/- 5 mm
$\Delta 3$ = Thickness	min ( +/- 5 mm; 1,5 % )
$\Delta 4$ = Difference between diagonal measures	
$\leq 6$ m	+/- 0,1 %
$> 6$ m	+/- 10 mm
$\Delta 5$ = Straightness (for element length)	
- length, width	+/- 0,1 %
$\Delta 6$ = Position of holes	+/- 5 mm

Installation tolerances for Kerto-Ripa elements

Installation tolerance class is specified in the installation plan.

Specifications for tolerance classes are described in standard SFS 5978:2014.



	CONTENT	SCALE
	ELEMENT TYPES TOLERANCES	1:10
DATE	24.05.2017	DRAWING NUMBER <b>332</b>